

AN ASSESSMENT OF THE EFFECTIVENESS OF FEDERAL ROAD SAFETY
COMMISSION IN REDUCING ROAD TRAFFIC ACCIDENTS IN KADUNA STATE,
NIGERIA.

BY

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DECLARATION

I declare that the work in this thesis entitled: “**An assessment of the effectiveness of Federal Road Safety Corps in reducing road traffic accidents in Kaduna state, Nigeria**” has been performed by me in the Department of Geography under the supervision of Dr. A. E. Ubogu and Dr R. O.Yusuf. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other Institution.

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CERTIFICATION

This thesis titled “**An Assessment of the Effectiveness of Federal Road Safety Corps in Reducing Road Traffic Accidents in Kaduna State**” by **FOLAGBADE ABIMBOLA M.** meets the regulations governing the award of the degree of Master of Science (Transport Management) of the Ahmadu Bello University, and is approved for its’ contribution to knowledge and literary presentation.

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DEDICATION

To God Almighty, my very present help in time of need for His unbending love, grace and strength in making this research a reality.

To my darling husband and true helpmeet, for being the pillar of support and motivation, for always pushing me to my destiny, for always giving me just what I need to get this work done.

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ABSTRACT

Road traffic accidents' statistics in Nigeria reveal a serious and growing problem with absolute fatality rate and casualty figures rising rapidly. This is a major issue being handled by the Federal Road Safety Commission, as its major role is to curb road traffic accidents on Nigerian roads. The study examined the effectiveness of Federal Road Safety Corps (FRSC) in reducing road traffic accidents in Kaduna state. The objectives were to characterize the commonest period of accidents in Kaduna state; to examine the road traffic enforcement equipments available to FRSC; to assess the measures adopted to reduce road traffic accidents and to examine the working conditions and enforcement capacity of FRSC officials on accident reduction. Four units of FRSC were selected in Kaduna state and four motor parks were also selected to obtain drivers' perception. The study was conducted by using two sets of questionnaires: one for the FRSC officials and the other for the commercial vehicle drivers. A total number of 214 questionnaires were used for the study, as completed by the FRSC officials and commercial drivers selected randomly from the four units. Data was analyzed using descriptive statistics, T - Test, chi square measured by Likert scale. The study revealed that 78% of the FRSC staff acknowledged that accident is mostly common between April and October and at night, there is a fair provision of enforcement equipments, public enlightenment program is the strategy that was mostly practiced to ensure road safety; 92% of FRSC staff desired special allowances for working at specific time and place and 27.9% of FRSC desired salary increase. The T-Test statistic for record of equipments reported a remarkable difference between number of equipment required and the number available ($t > 1.00$, $p < 0.1$) and no difference in the number of available equipments and number working ($t < 1.00$, $p > 0.1$). Likert scale measured the perception of commercial drivers of FRSC staffs. The study concluded that even though Federal Road Safety Corps (FRSC) is effective in reducing road traffic accident occurrences in Kaduna state, there aren't enough enforcement equipments, strategies and manpower to boost the effect of their activities. It is therefore recommended that adequate and standardised enforcement equipments be provided for all FRSC units in Kaduna state and consultations should be made to all stakeholders on better accident reduction measures.

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CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Modern transport and freight distribution system all over the world is tending towards the adoption of best practices that are reliable, timely and cost-effective (Ubogu, 2011). This is because transportation has been discovered to be a major prerequisite to the development of any economy. Like other activities that are intensive in utilization of infrastructure, the transport sector is an important component of the economy impacting on development and the welfare of the people (Rodrigue and Notteboom, 2009). Transport provides the arteries through which the economic life of people, information and raw materials as well as finished products can be moved from one place to another (Ighodaro, 2009). Road transportation provides benefit both to nations and individuals by facilitating the movement of goods and people thereby enabling increased access to jobs, economic markets, education, recreation and healthcare, which in turn have direct and indirect positive impacts on the health of populations (WHO, 2009). Despite these multiple advantages, road accidents have serious negative consequences on the economy of a nation.

Road traffic accidents have been a major issue to both developed and developing world today. One of the major concerns of any nation's transportation sector is how to curb road traffic accidents in such a country. The growing number of deaths and injuries as a result of road traffic accidents is a global phenomenon that all countries of the world are grappling with. According to World Health Organization as cited by Aderamo (2012a), road traffic accidents and deaths are a global disease sweeping through the world gradually.

The World health Organization estimates that more than 3000 people are killed every day in road traffic accidents globally with at least 30,000 people injured or disabled and this adds up

to over 1million people killed and between 20 – 50 million people injured or crippled in road traffic crashes each year (Krug, Sharma and Lozano, 2000). Jacobs, Aaron- Thomas and Astrop (2000) estimated that the global cost of road crashes is about 518 billion US dollars annually, and ranges in percentage of GNP from 0.3% in Vietnam to almost 5% of GNP in the United States of America, Malawi and Kwa Zulu Natal, South Africa. The true costs of accidents to the society are probably much greater, since these estimates are based on direct costs only. The problem of transportation safety is of great magnitude encompassing all modes of transportation, economic levels and transport purposes.

The rising trend in morbidity and mortality rate due to road traffic accidents in low and middle income countries has made some authors to declare road traffic accidents an “epidemic”(Nantulya and Reich, 2002; Aderamo, 2012a; Atubi, 2012g).

Traffic accident mortality rates doubled in Ghana between 1994 and 2004, increasing public awareness of the issue and prompting the government to take action. To curb the rise in death rates, the government implemented both structural and behavioural plans aimed at crash prevention. Structural plans took the form of speed bumps and rumble strips, while a behavioural plan used informational television advertisements to educate citizens about drunk driving and speeding. From 2000 to 2005 road traffic deaths in Tanzania increased by nearly 50 per cent. In an effort to improve response mechanisms, a trauma-team training programme was offered to help nurses and physicians assess and assist victims of traffic accidents. An evaluation of this programme showed a positive response by students and a post-training simulation showed an overall improvement in response capabilities (Eshbaugh, Maly, Moyer and Torkelson, 2012).

Over 42,000 road users are killed in European Union (EU) countries annually and around 3.5 million are injured. This accounts for an annual cost of over 160 billion Euros and

untold pain and suffering of the victims and their relatives (Aldona and Gravydas, 2007). The global cost of road accidents and injuries are enormous.

At the first African Road safety congress held in Nairobi, Kenya in 1989, Nigeria was ranked ahead of other African countries in terms of mortality rate on her highways, with the chances of a vehicle killing someone 47 times higher than in Great Britain (Onakomaiya, 1990). In terms of safety, Nigeria is a high risk region with an average of 32 traffic deaths per 1000 people (Filani and Gbadamosi, 2007). This is very high compared with the United States' 1.6 traffic deaths per 1000 population and the United Kingdom's 1.4 deaths per 1000 population (Trinca, 1988). In terms of traffic safety, there is an average of 230 accidents per 10,000 vehicles in Nigeria. This is far in excess of United State of America's accident rate of 2.7 per 10,000 vehicles and the United Kingdom's accident rate of 3.2 per 10,000 vehicles (Obinna, 2007). These data show that Nigeria has the highest rate of death from motor accidents in Africa.

Road crashes started in Nigeria in 1906 at Lagos. Ever since then it has been a public health concern based on the number and magnitude of persons killed and injured. Between 1960 through to 2006, a total of 969,618 road crashes were reported leading to a casualty figure of 1,159,642 persons, distributed as 292,703 persons killed and 866,939 persons injured (Arosanyin, Olowosulu and Oyeyemi, 2012). These figures of crashes and casualty are an under-estimation of the realities on Nigerian roads, as it has been argued that there are high non-reporting and under-reporting of road crashes (Arosanyin, 2004). A comparative assessment of the causes of deaths in Nigeria has placed road crashes as the most important killer of Nigerians than a combination of 35 notifiable diseases including malaria and HIV/AIDS. This burden is more given that the estimate covers only casualty component (Arosanyin, 2008). Indeed, the Nigerian accident pattern seems to suggest that the better the road, the higher the accident and

fatality rate as well as the severity and non-survival indices. This is because of non compliance of drivers with speed limits (Filani and Gbadamosi, 2007).

In the year 2012, at the special marshal workshop held in Kaduna state, it was announced that between January and July 2012, a total of 2, 200 traffic offenders were apprehended while 597 road traffic accidents were recorded in Kaduna state. Out of these accidents, 125 fatal cases, 389 serious cases and 58 minor cases occurred while 297 persons were killed and 2, 239 persons were injured (FRSC, 2012). Owing to these facts, the high rate of accidents in Kaduna state is obviously unacceptable.

In the event of road traffic accidents, there have been numerous methods of management, reduction and prevention. The use of traffic law enforcement agencies and associated organizations happens to be a major policy effort in accident reduction cases. Early attempts in the enforcement of road traffic regulations in Nigeria were limited to discrete and isolated attempts by some states of the federation. Notably among the efforts to institute a formidable road safety program, was the effort of Shell Petroleum Development Company of Nigeria (SPDC) between 1960 and 1965. The effort of the Nigerian Army in the training of its officers and men on road safety in the early 1970's also contributed to road safety idea and consciousness in Nigeria. The Nigerian Army started the first public road safety campaign in 1972 when it initiated an annual road safety week. The first deliberate policy on road safety was the creation in 1974 of the National Road Safety Commission (NRSC) by the then Military Government. The impact of the Commission was however, not sustained. In 1977, the Military Administration in Oyo State, Nigeria established the Oyo State Road Safety Corps which made some local significant improvements in Road Safety and road discipline in the State. This lasted till 1983 when it was disbanded by the Federal Government (FRSC, 2009).

With the continued rising trend of road traffic accidents in Nigeria then, which placed it as one of the most road traffic accident (RTA) prone countries worldwide (second to Ethiopia) (FRSC, 2012), the Nigerian Government saw the need to establish the present Federal Road Safety Corps in 1988 to address the carnage on the highways. The Federal Road Safety Corps (FRSC), Vehicle Inspection Office (VIO) and the Nigerian Police (Motor Traffic Department) all have a common goal of prevention and reduction of accident occurrences in Nigeria. The functions of the FRSC generally relates to making the highway safe for motorists and other road users; recommending works and devices designed to eliminate or minimize accidents on the highways and advising the Federal and State Governments including the Federal Capital Territory Administration and relevant government agencies in the localities where such works and devices are required and educating motorists and members of the public on the importance of discipline on the usage of roads (FRSC, 2012). Directorate of Road Traffic Service, (DRTS), popularly known as Vehicle Inspection Office (VIO), is a government agency saddled with the task of transport management on Nigerian roads within the Federal Capital Territory (FCT) and the 36 states of the federation. DRTS was established by law to specifically issue driver's license, vehicle papers registration, production and issuance of plate numbers and inspection of vehicles (Mbachu, 2012).

However, there are arguments in the public domain among agencies of government which appear to have overlapping functions. For example, motorists are of the view that the functions of the Federal Road Safety Corps, the Nigerian police and that of the DTRS are almost similar and conflicting, all working towards ensuring the safety of Nigerian roads (FRSC, 2009). Therefore, it is worthy of note that Federal Road Safety Corps is a major force in road traffic

issues in Nigeria and therefore requires proper assessment of her role in road traffic accident reduction.

1.2 STATEMENT OF THE RESEARCH PROBLEM

The overall goal of the decade of action for road Safety, 2011 - 2020 is to stabilize and then reduce the forecast level of road traffic fatalities around the world by 2020 (WHO, 2011). Road safety is a foremost priority in the mind of all road users. However, in Nigeria, in spite of efforts of road traffic enforcement agencies, the rate of road traffic accident is alarming and calls for investigation.

The mission of safe road in Nigeria initiative is to reduce road crash deaths and injuries to 50% by 2020. Safe road in Nigeria is a response to the United Nation's decade of action for road safety. It is one of the initiatives of Federal Road Safety Corps of Nigeria to promote safety on our roads by expressing their determinations in seven facts. Fact 1: Road crashes kill more than HIV/AIDS and Malaria. Fact 2: there's someone you know who has been killed or injured in a crash. Fact 3: people are killed or injured in road crashes every day. Fact 4: all road crashes can be prevented. Fact 5: most crashes are caused by the driver's behavior and not always as a result of bad roads. Fact 6: the idea of a "safe road" in Nigeria is more of changing our driving behavior than advocating for good road infrastructure. Fact 7: we can reduce deaths and injuries due to crashes by 50% if we make a commitment to not drink and drive, not over speed, wear seat belts and helmets, not use phone or eat while driving, obey traffic rules and tell people about safe road Nigeria (FRSC, 2012). As laudable as the functions of this government agency appear, the public view it as revenue generating unit rather than an agency that implement policies that should ensure road safety compliance and culture of road safety discipline by road users (Arosanyin *et al*, 2012; Mbachu, 2012).

Several researches have been conducted on road traffic accidents in Nigeria and most of these reports relate accident rates to negligence of road users and poor road infrastructure. Aderamo (2012b) examined the spatial variation of road traffic accidents casualties with a view to suggesting measures to reduce the scourge. The data used for the study included the number of deaths and injuries from road traffic accidents in Nigeria over a four year period (2004-2007). The findings showed that spatial variation exist in the incidence of road traffic accidents in Nigeria. It also showed that total road traffic accidents, population estimate, road lengths and number of registered vehicles are important variables to take into consideration in examining road traffic accident casualties in the country.

A study of the causal factors of road traffic crashes in southwestern Nigeria by Aworemi, Abdul- Azeez and Olabode (2010) concluded that human, vehicle, roadway and environment are the salient factors that had significant contribution of about 79.4% on the road traffic crashes in the study area. Ohakwe, Iwueze and Chickezie (2011) also analyzed road traffic accidents in Imo state, south- eastern Nigeria. The study concluded that crashes such as Motorcycles- Motorcycle (McMc), Motorcycles- Vehicle (McV) and Vehicle- Vehicle (VV) are the leading types and accounted for the greater number of deaths. In these findings, it was observed that reckless driving, inexperience, mechanical fault and bad roads are the major causes.

Chukwuemeka (2012) observed that the most perturbing problems in the issue of road accidents are the seemingly incorrigible attitude of drivers to overloading of goods and passengers. Granted that there are multiple areas of concern, the offence of overloading is rife on Nigerian highways. In this respect, many motorists appear ignorant of essential principles outlined in the Highway Code. Therefore, it is not surprising that many of these drivers do not see these guidelines as congruent enough with road safety. Cars, minibuses and taxis are

predominantly involved in road traffic accidents. Furthermore, Arosanyin *et al* (2012) examined the level of compliance with some basic road traffic regulations among commercial motorcyclists commonly called Okada riders. The data for the analysis were collected from 334 commercial motorcyclists from Samaru - Zaria in Northern Nigeria through structured questionnaire coupled with observation and inspection. This study discussed the aspect of compliance of only a percentage of road users (motorcyclists). In its findings, it was observed that the driver licensing procedure is faulty. The fact that about 42% of the motorcyclists are not aware of the existence of the Highway Code which is expected to guide their conduct on the road is indicative of the fact that they did not pass through the theory and practical test required for issuing driver license. No matter how good a licensing system may be, non adherence to guideline before certification will jeopardize the intention. Secondly, the results further confirm that traffic law enforcement is still below optimal. About 36% of the motorcyclists did not have a valid rider license; 84% did not put on safety helmet; and most of the times operators carry more than one passenger at a time.

Considering the above mentioned research works, various causes of increase in road traffic accidents have been identified using various parameters. However, there still exists a gap in the issues of road traffic accident reduction in Nigeria particularly in the aspect of traffic regulation enforcement agencies. These enforcement agencies over the years are known to be a major force in prevention, control and reduction of road traffic accidents, and are generally observed to be functional in their duties, yet there is an alarming increase in accident rate. An examination of the studies available reveals that not much attention had been given to the effectiveness of agencies responsible for the reduction of accidents and road safety. Hence, there is a need to

thoroughly examine how effective this agency is in its duties of reducing road traffic accidents in Kaduna State. This study intends to address the following questions:

- i. What are the commonest periods for the occurrences of road traffic accidents in Kaduna state?
- ii. What are the road traffic enforcement equipments available to FRSC in Kaduna state?
- iii. What are the measures put in place to reduce road traffic accidents in Kaduna state?
- iv. What is the nature of the working conditions of FRSC officials in Kaduna state?

1.3 AIM AND OBJECTIVES

The aim of this study is to assess the effectiveness of Federal Road safety Corps in reducing road traffic accidents in Kaduna state. To achieve this aim, the specific objectives to be pursued are to:

- i. characterize the commonest period for the occurrences of road traffic accidents in Kaduna state;
- ii. examine the road traffic enforcement equipments available to FRSC for accident reduction;
- iii. assess the measures adopted to reduce road traffic accidents and
- iv. examine the working conditions and enforcement capacity of FRSC officials on road accidents reduction.

1.4 HYPOTHESES

For the purpose of clarity, the research hypotheses that will guide this study are:

Null hypothesis

There is no significant difference between the number of required enforcement equipments and number of available equipments owned by FRSC.

1.5 THE SCOPE OF THE STUDY

This research examines the level of infrastructural facilities in place for FRSC in Kaduna state and also to check if these facilities meet global standards. The working conditions and welfare of the workforce of the commission was assessed. Finally, the strategies developed to reduce road accidents and the level of achievement of these strategies was also examined.

This study covers majorly four divisions of Kaduna state namely Kaduna metropolis, Kafanchan, Zaria and Kakau. The respondents are road traffic enforcement agents from Federal Road Safety Commission (FRSC) and motorists in the above named locations in the state.

The survey was carried out for a period of six months spanning from April, 2013 to September, 2013 and it involved the collection and collation of data, analysis and interpretation of analyzed data.

1.6 SIGNIFICANCE OF THE STUDY

Road traffic accidents in Africa are expected to rapidly increase over the next four decades to become a major public health challenge across the continent (Eshbaugh *et al*, 2012). However, forecasts show that if policy interventions on the continent effectively put the brakes on road traffic accidents, then, cumulatively through 2050, 42 million road traffic deaths would be prevented, 144 million years of productive, healthy life would be saved and US \$ 234 billion would be added to the continent's GDP (Eshbaugh *et al*, 2012).

The findings of this study will portray how the above forecasts can be actualized through the performance of the Federal Road Safety Corps in Kaduna state, Nigeria. Better methods of management, enforcement of road traffic rules and reduction of accidents is suggested in this study for the benefit of the government and all road traffic enforcement agencies, especially the

FRSC. Also, all road users (private car drivers, commercial vehicle drivers, truck drivers, motorcycle and bicycle riders and pedestrians) will be exposed to the essence of compliance to road safety regulations for the purpose of safety of lives and properties while on the road.

All stakeholders (government establishments, private organizations, institutions and religious bodies) will be aware of the importance of compliance to road safety rules for the benefit of the nation as a whole through the findings of this study. This study will enable the government to develop policies and strategies to reduce road traffic accidents in the country for the overall goal of the country's development.

CHAPTER TWO: CONCEPTUAL ISSUES AND LITERATURE REVIEW

2.1 INTRODUCTION

This chapter gives a proper evaluation of the various research works related to road traffic accidents and enforcement of road traffic rules and regulations. It also discusses the various methods of analysis used in those studies, their discoveries and findings on road traffic accidents. It examines a review of relevant literature and conceptual framework which forms bedrock of accident prevention mechanism in Nigeria and other countries.

Also, it discusses concepts and theories relating to road traffic accidents, methods of management of accidents and models of forecasting.

2.2 CONCEPTUAL ISSUES

The concepts to be reviewed in this section are the International futures forecasting model, the Haddon matrix and the systems approach to road safety. The international futures forecasting model discusses what the case of road traffic accidents will be in the near future. The Haddon matrix is a concept where the issue of time periods against some factors are discussed in relation to interventions to road traffic accidents. Finally, the systems approach to road safety is a concept that identifies the interaction between road users, the vehicle and the environment as potential areas for intervention.

2.2.1 International Futures (IF) Forecasting Model

IFs forecasting model anticipates that global traffic deaths will surpass 3 million people per year. This forecast shows that Africa will be particularly hard hit and will account for over 1 million of these deaths, or 35 per cent of the global total. It examines the positive economic and social effects of reduced traffic injuries and deaths by comparing base case forecast with an improved

scenario. For the latter scenario, it is assumed that all African countries are able to stabilise death rates from traffic accidents at or near the current continental average (32 per 100 000 people). The first part of this attempts to understand traffic fatalities as a development issue, analysing the risk factors that contribute to accidents and suggesting interventions that address these risks. The final part focuses on scenario development, exploring the social and economic value of increasing road safety in Africa (Eshbaugh *et.al.*, 2012)

2.2.2 The Concept of Development as Related to Accident Cost

This depicts the human and financial costs of traffic accidents in relation to a country's level of development. The blue line represents the loss of human life and how low-income countries with few vehicles on the road have a small number of traffic accidents. Then, traffic fatalities grow rapidly during the middle-income stage of development. Thereafter, countries experience a drop in traffic accidents, as infrastructure improves to accommodate motorisation, road rules become embedded norms and fewer dangerous, unmaintained vehicles stay in operation.

The red line represents the loss of material resources and the impact of traffic accidents on economic growth at various stages of development. It shows that while the death rate declines at certain levels of development, the economic burden does not; traffic accidents in higher income countries have a hugely negative effect on GDP. In order to explore where Africa is currently situated along this graph, the continent's vehicle ownership and development trajectory should be understood.

In Nigeria, vehicle ownership per 1000 people stands at 31 in 2007 while vehicle ownership in Africa as at 2012 stands at around 100 licensed vehicles per 1 000 people, but is forecast to grow to 170 by 2050 (World bank, 2012).

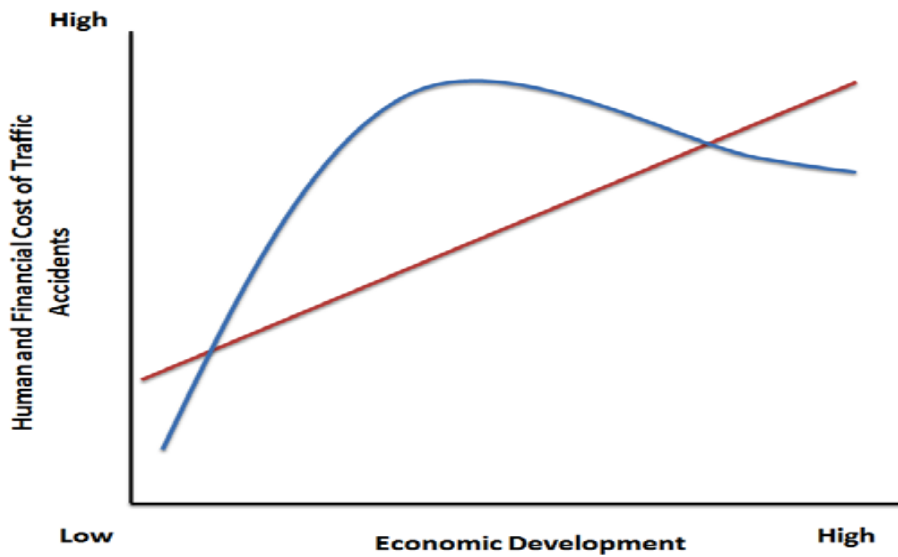


Figure 2.1: Relationship between development and traffic accident burden

Source: African Futures Brief (2012)

Blue line: loss of life at different levels of development.

Red line: cost of traffic accidents at different levels of development.

2.2.3 The Haddon Matrix

Haddon Matrix offers a useful way of categorising traffic related interventions. The matrix suggests that, when creating policies to reduce road traffic deaths, there are three time periods to consider (pre-crash, crash and post-crash) against four types of factors (human, vehicle, environmental and social). The Global Plan for the Decade of Action for Road Safety 2011–2020 promotes this integrated approach (Eshbaugh *et. al*, 2012).

TABLE 2.1 The Haddon Matrix

	Pre- crash	Crash	Post-crash
Human factors	Licensing, driver impairment, training, attitude, distractions	Personal protective equipment	Crash education/ evaluation research, training,
Vehicle factors	Braking, vehicle design, maintenance, passenger/loads, equipment	Vehicle safety equipment (i.e. seatbelt use)	Automatic notification systems, research collision crash
Environmental Factors	Regulation, enforcement, hazards, natural hazards, driver distractions, built environment, road design/maintenance	Other vehicle design, road ‘furniture	Emergency service response, infrastructure medical health
Social Factors	Enforcement, awareness, incentives, rider peer pressure	Safety attitude/ involvement community	Medical community attitude/involvement, political will

Source: African Futures Brief (2012)

- a. **Pre-crash phase:** Factors such as drug abuse, alcoholism, poor vision, aggressiveness, poor driving habits, deficiencies in the vehicle and deterioration of the road infrastructure were identified as major causes to increase the likelihood that accident occurs. This phase is usually concerned with accident avoidance and prevention (Rodrigue and Notteboom, 2009).

- b. **Crash phase:** once an accident is initiated, injuries and damages of various degrees of severity are sustained on the infrastructure, vehicle, driver and passenger. Contributory factors at this stage include the existence of road ridges and continuous protrusions on the exterior and interior of the vehicle, fire outbreak to cause injuries to the vehicle, occupants or pedestrians in the event of the crash occurring. The main concern at this stage is to guarantee the integrity of the passengers and their safety. The crash design of vehicle should provide for safety and preventive gadgets to absorb shock. Restraint devices such as safety belts and head rest that can prevent passengers from being choked from the vehicle should be installed. The focus at this phase is on injury prevention.
- c. **The post-crash phase:** this phase is concerned with the saving of lives, reduction of permanent disabilities and prevention of unnecessary deaths. The focus is the accessibility to adequate and prompt emergency communications, transportation and medical care. It determines the likelihood of the continuing survival for the survivor of the road traffic accidents. The concern of this phase is on severity reduction which should include the availability and efficiency of ambulance services in handling victims at accident scenes and receptivity of hospital staff to road traffic accident victims who are not accompanied by police reports.(Eshbaugh *et. al.*, 2012)

2.2.4 The Safe System Approach to Road Safety

The safe system approach is a holistic view which provides a framework to assess, guide and improve travel safety. At the core of this is the need for responsibility for reducing risk to be shared by road users and those who design, maintain and operate all parts of the road transport system. This approach recognises that the human body is highly vulnerable to injury and that humans make mistakes. The human behaviour is dependent on the demographic characteristics

of road users, people's perception of risks and their general behaviour on the roads (WHO, 2003). Examples of mistakes that humans make are misuse of road facilities, misinterpretation of highway codes, signs and symbols. It does not ignore risk taking behaviour, but acknowledges human fallibility and the need for greater allowances for human error. A safe road traffic system is therefore one that accommodates and compensates for human vulnerability and fallibility. The system accounts for human fallibility in the light of the following guiding principles:

1. The limits of human performance: we all make mistakes and we all need to acknowledge the limits of our capabilities.
2. The physical limits of human tolerance to violent forces; we are physically vulnerable when involved in a traffic crash.
3. Shared responsibility: all of us take an individual and shared role in road safety.
4. A forgiving road system: so that when crashes do happen, death can be avoided and injuries minimised (Western Australian Local Government Association, 2014)

The world report promoted a comprehensive approach to road safety which involves identifying the interactions between the road user, the vehicle and the road environment- i. e. the potential areas for intervention. To adopt a systems approach necessitates the involvement society and special interest groups (WHO, 2009). The collaboration of these special interest groups involves the following key components:

1. Safe roads and roadsides that is predictable and forgiving of mistakes. The designers should encourage appropriate road user behaviour and speeds in their construction.
2. Safe speeds that suit the function and level of safety of the road. Here, road users understand and comply with speed limits and drive to the conditions.

3. Safe vehicles that help prevent crashes and protect road users from crash forces that cause death and serious injury. This is the responsibility of vehicle manufacturers to ensure non-compromising standards in their creations.
4. Safe road use ensures that road users are skilled, competent, alert and unimpaired, and that people comply with road rules, choose safer vehicles, take steps to improve safety and demand safety improvements. This is done by road safety enforcement agencies, the traffic departments and the police. (New Zealand Transport Association, 2013)

The basic strategy of a Safe System approach is to ensure that in the event of a crash, the impact energies remain below the threshold likely to produce either death or serious injury. This threshold will vary from crash scenario to crash scenario, depending upon the level of protection offered to the road users involved (Organisation for Economic Cooperation and Development, 2008).

2.3 LITERATURE REVIEW

The global cost of road crashes is about 518 billion US dollars annually, and ranges from percentage of GNP of 0.3% in Vietnam to almost 5% of GNP in the United States of America, Malawi and Kwa Zulu Natal, South Africa. The true costs of accidents to the society are probably much greater, since these estimates are based on direct costs only (Jacobs *et.al*, 2000). Analysis of global statistics indicates that fatality rates (per licensed vehicle) in developing countries are high in comparison with those of developed countries. African countries in particular have rates often 30 to 50 times greater than those in the countries of Western Europe. (Adeniji, 2002). At the global level, road accidents have been ranked as the 9th leading cause of mortality (WHO, 2011). (WHO, 2009) estimated that 1.17 million deaths occur each year worldwide due to road traffic accidents. Succinctly, this accounts for about 70% of deaths in developing countries such as Nigeria. The increased rate of fatal road traffic accidents worldwide

has been attributed to population explosion and increased motorization (Atubi, 2008). Increased motorization may be characterized briefly as the “automotive revolution”, that is, the motorizing of urban population especially in the developing countries. Approximately 1.3 million people die each year on the world's roads, and between 20 and 50 million sustain non-fatal injuries (Atubi, 2012d). With these underlining issues and with the advancement in knowledge and technology, there is no doubt the inevitability of the increase in the creation of quality and quantity of vehicles. Therefore, motorization will continue to increase annually given that there will be continued migration and non expansion of cities.

The Global status report on road safety is the first broad assessment of the road safety situation in 178 countries, using data drawn from a standardized survey. The results show that road traffic injuries remain an important public health problem, particularly for low-income and middle-income countries. Pedestrians, cyclists and motorcyclists make up almost half of those killed on the roads, highlighting the need for these road users to be given more attention in road safety programs. The results suggest that in many countries, road safety laws need to be made more comprehensive while enforcement should be strengthened. The Global status report on road safety results clearly show that significantly more action is needed to make the world's roads safer(WHO, 2012). However, what began as a problem in the developed world, now affects most low-income countries. Due to increasing motorization and inadequate infrastructure development, road traffic injuries in Latin America, Asia and especially Africa are now a serious cause for concern (Eshbaugh *et. al.* 2012).

International comparison indicates that the chance of a vehicle killing someone in Nigeria is 47 times higher than in Britain. The proportion of fatalities to injuries reported is also very high. For example, while Czech Republic has only one death in 175 accident, France has

one death in 175, South Africa has one death in 47 accidents while Nigeria has one death in 2.65 accidents (Atubi, 2010b; Atubi and Onokala, 2009; Atubi, 2012).

2.3.1 Road Traffic Accidents in Nigeria

Nigeria ranks among the worst in the world for road traffic accidents (at 191 of 192 countries), according to a WHO, 2009 survey. However, despite the significant numbers of Africans being injured or killed in this way, road traffic accidents do not receive the same coverage as other public health issues such as HIV/AIDS, tuberculosis and malaria (Esbaugh *et. al.* 2012). In Nigeria, road traffic accident situation over the last three decades has been particularly disturbing. In 1976, there were 53,897 road traffic accidents resulting in 7,717 deaths. Although in 1981, there was reduction in magnitude of accidents, but an increase in fatality. The trend in accidents increased between 1990 and 2005 and the fatality rate remained consistently high (Atubi, 2009). An analysis of the traffic crashes data recorded over a seven year period of 2000-2006 shows that 98,494 cases of traffic crashes were recorded out of which 28,366 were fatal and resulted into 47,092 deaths (FRSC, 2009). The number of reported cases of fatal road traffic accidents in Nigeria has shown an increasing trend of accidents from 1995 to 2004, indicating an increase in fatal road accidents from 1995 to 1996 (CBN, 1997). Fatal road accident figures across the federation of Nigeria rose sharply in 1992 (CBN, 1994).

It was observed that between 1970 and 1979 and between 1990 and 1999, there was an increase in road traffic accidents accounting for deaths. There may be probably explanations for this. The oil boom in Nigeria was experienced in the 1970s and many people were possibly financially empowered and so were able to buy cars. Also during this period, the value of the Naira was high. Most of the roads were also in good shape. But because not many people had been exposed to the use of cars before then, there were many cases of RTAs (Osime *et. al.*,

2006). Also, because the experience was relatively new, it could be assumed that there were few cases of speeding. Thus, with the good roads and reasonable speed on the part of the drivers, even though there were many cases of RTAs, the deaths were just minimal. However, a sharp contrast is observed during the period between 1990 and 1999. Even though the number of RTAs has declined relatively, the mortality rate increased. This is the period when the country started to experience an economic downturn. Consequently, most people were no longer able to buy new cars. Instead, there was a high demand for used vehicles with the attendant consequences of increasing fatalities on the roads. Also, because of the poor economy, most roads were now in a state of disrepair becoming more prone to fatal accidents. It was also within this period that the health-care facilities witnessed utter neglect and were barely able to handle cases resulting from road traffic accidents. Poor road structure and population growth have greatly led to increase in the roads and accident rate (Osime *et al.*, 2006).

As in other developing countries, road traffic accidents in Nigeria are one of the most serious problems in need of pragmatic solutions. Yet this problem has been difficult to address probably because of the country's level of development. Nigeria is said to have the highest road traffic accident rates in Africa (Akpoghomeh, 1998; Obinna, 2007; Atubi and Onokala, 2009). Based on data used to make conservative estimates, Nigeria is a country with a serious and growing road accident problem that is among the worst in the world (Asogwe, 2003). Thus, Nigeria's annual 8,000 to 10,000 traffic accident deaths between 1980 and 2003 were a major personal and traffic safety problems as well as a terrible waste of human resources for the country. In terms of the personal safety problem, Nigeria indeed is a high risk region with an average of 32 traffic deaths per 1,000 people (Filani and Gbadamosi, 2007). Road traffic collisions kill nearly 1.2 million people around the world every year due to speeding, driving

under the influence of alcohol, poor road design; poor enforcement of road traffic regulations and unsafe vehicle design (WHO, 2003). In Nigeria, road traffic fatality rates peaked in 1981, showing a 400 per cent increase in the number of annual deaths in the period 1971–1981. However, increased safety awareness and slowed motorization due to an economic downturn, saw accidents drop over the following decade. Improved economic performance in the late 1990s meant road traffic fatalities increased again, an upward trend that still continues. The Nigerian government has taken steps to improve access to alternate methods of transportation (Eshbaugh *et.al.* 2012).

Income loss from 2009 road traffic collision in Nigeria was more than the GDP of over 20 individual African countries (Ogwueleka and Ogwueleka, 2012). Road crashes cost Nigeria about 13% of her gross national product (GNP), which inhibits economic and social development (Idoko, 2010). Nigeria loses about 3% of GDP from road traffic crashes, that is, about 17% of current national reserves. Income lost from 2009 road traffic collision in Nigeria was more than the GDP of over 20 individual African countries. In Nigeria, human factor is believed to constitute about 85% of the recorded causes of road traffic accidents. Various researches conducted in Nigeria are of the consensus that accidents though a human factor results from drunk driving, drugs, poor driving skills, health problems psychological problems and temperament, these manifest in different ways among drivers (FRSC, 2012).

According to Aderamo(2012b), on the spatial variation of road traffic accident casualties in Nigeria, the data used for the study included the total number of deaths and number of injuries from road traffic accident in Nigeria for the period 2004 to 2007. Human factors including road user behavior and incapacitation have been found to account for more than 85 per cent and among them, the two-best-known contributing factors are speeding, drinking and driving. Human

incapacitation, such as visual acuteness and driver fatigue has also been identified among the human factors.

2.3.2 Road Safety and Enforcement Capacity in Nigeria

With the establishment of the fact that human behavior constitutes the largest percentage of factors that is specifically known to cause road traffic accidents, there is a higher need to control the behavior of road users. Therefore, this has necessitated the need for a strong team of traffic enforcement agents whose focus will be on road safety. Traffic regulations address the mutual relationship between road users and the relationship between road users and their surroundings. They are aimed at promoting the safe and smooth flow of traffic on roads. Unconscious violation of rules should be addressed by road and vehicle design, but conscious breaking of rules must be addressed through traffic enforcement (European Transport Safety Council, 2011).

The origin of the Road traffic service dates back as far as 1967 which was established in the creation of the Nigeria Police under the Northern Nigeria Cap 118 of 1967, the Western region Cap 115 Of 1965 and the Eastern Region Cap 116 Of 1967. The Directorate of Road Traffic Service (DRTS) which is commonly referred to as the VIO is as old as the use of vehicles in Nigeria. Popularly known as Vehicle Inspection Office (VIO, DTRS), it is a government agency saddled with the task of transport management in our roads within the federal capital territory (FCT) and the 36 states of the federation. There are however concerns raised on their activities as well as contention over their functions (Mbachu, 2012). This came as a result of challenges encountered by road users arising from the recklessness of motorists who find it extremely difficult to comply with traffic rules and regulations. The Act establishing the road

traffic service then empowered it with the statutory functions such as issuance of drivers' license and inspection of vehicles.

The Federal Road Safety Commission (FRSC) was established as a child of necessity, to arrest the increase in road traffic crashes which existed in the country. The increase in road traffic crashes then, traced to the upsurge in vehicular traffic resulted from the economic boom during the period. The Nigerian Army reacted to this ugly trend by organizing an annual road safety campaign week. The then Federal Military Government of Nigeria in its own response instituted the National Road Safety Commission (NRSC), which was placed under the supervision of the Federal Ministry of Works from 1974 to 1988. In spite of the fourteen years that the NRSC existed and operated, the Nigerian highways became progressively dangerous as the lives of road users were lost through preventable road crashes. In search of a credible and effective response to the challenges posed by these road traffic crashes, the Federal Military Government of Nigeria on February 18th, 1988 established the Federal Road Safety Commission as the lead government agency on road safety matters; vide Decree No 45 of 1988 as amended by Decree 35 of 1992. While Decree 45 of 1988 restricted FRSC operations to Federal highways, Decree 35 of 1992 expanded its jurisdiction to cover all public highways in the country and also empowered the personnel of the Corps to bear arms. This was recently repealed and re-acted as the FRSC (Establishment) Act, 2007. The essence of the 2007 enactment was to capture current issues and broaden the Commission's mandate to holistically address issues bordering road traffic administration and safety management in Nigeria (FRSC, 2009).

The legal instrument was passed by the National Assembly as the Federal Road Safety Commission (establishment) Act 2007, and broadly delineated the functions of the Commission as that of making the highway safe for motorists and other road users; recommending works and

devices designed to eliminate or minimize accidents on the highways and advising the Federal and State Governments, including the Federal Capital Territory accordingly; and educating motorists and members of the public on discipline on the highway. Specifically, the Commission covers about 18 items on its statutory responsibilities, which encompass preventing and minimizing of road traffic accidents, clearing of obstructions on the highway, public enlightenment, providing prompt attention and care to victims on road traffic accidents. It also involves determining and enforcing speed limits for all categories of roads and vehicles, cooperating with agencies and groups engaged in road safety activities to prevent highway accidents, and conducting researches into the causes, effects and methods of preventing road traffic accidents (Akpomera, 2011).

Monitoring and evaluation is more difficult in developing countries such as Nigeria, which lack the basic information technology and data infrastructure as well as the electronic devices required to effectively, implement a road safety monitoring and evaluation mechanism. In its absence, there is a heavy reliance on human capital in the form of enforcement personnel (FRSC, 2009).

2.3.3 Road Traffic Accidents in Kaduna State

Analysis of data on the number of vehicles involved in road traffic accidents in Kaduna State from 1981 to 1986 indicates that a large proportion of the vehicles involved in accidents during this period were privately owned vehicles such as commercial buses and taxis. Accidents were most often caused by excessive speed and driver recklessness and negligence, rarely by mechanical defects. The generally low level of education of many of the drivers and the fact that they received their driver's training in private lessons cast doubt on the seriousness of the driving

tests which have to be passed to obtain a license. Analysis of data on the role of law enforcement agents shows a decline in the proportion of road traffic accident cases prosecuted, convicted, or acquitted, while the proportion of persons awaiting trial and those under investigation increased and remained large (Ogunjumo, 1995).

A study of road traffic accident was carried out in Zaria, a major city in Kaduna state for the period of eight (8) years, from 1972 to 1979. It was found that there were more road traffic accidents on Tuesdays and Wednesdays than Fridays and Saturdays and more cases of such accidents were witnessed in the months of September and October with the least recorded accidents in February and June. Recklessness and negligence of drivers was found to be mostly responsible for the cause of accidents. Private car drivers played more roles in accidents in Zaria than any of the other participants like taxi drivers, bus drivers and motor cyclists (Aganga and Umoh, 2012)

Between January to July 2012, about 2,239 people were involved in road accidents in Kaduna State. Among the figure involved in the accidents, about 297 persons were killed and between January and July 2, 2012, 2,200 traffic offenders were apprehended while 597 road traffic crashes were recorded and 125 fatal cases, 389 serious cases and 58 minor cases. In this road crashes 297 persons were killed while 2,239 persons were injured (Bello, 2012)

The Public Education Officer (PEO) in the Federal Road Safety Corps (FRSC) state sector command disclosed that about 192 people lost their lives in different road accidents in Kaduna State from January to March 2012. It was stated that 231 road accidents were recorded within the months under review involving 1,885 people noting that 927 people sustained various degrees of injuries. This figure excludes accident rescue made by other security agencies and good

Samaritans which are not made known to the command. The accidents which involved 244 vehicles and 87 motorcycles were mostly caused by non-compliance of drivers, riders as well as passengers to road traffic rules and regulations (Alabi, 2012)

2.3.4 Human Capacity Building

According to (FRSC,2009), the Federal Road Safety Commission has developed an approach to focus on the obstacles that inhibit its officials from realizing their goals of accident reduction and road safety and enhance their ability to achieve a measurable and sustainable accident free nation. Few of these are examined.

In line with its sustained vision to transform to a world class digital-driven government agency, no fewer than 948 staff of the Federal Road Safety Corps (FRSC) comprising members of the management team and other senior officers has been awarded certificates for scaling through the compulsory International Computer Driving License (ICDL) training. This was aimed at closing the information and technology skills gap among the staff of the organization, especially in view of the full digitalized operations in the Corps' activities. This training was planned to help the staff to embrace the digital world and eliminate the analogue system of carrying out duties within the organization. This is part of capacity building to enhance their ability to function in a digital atmosphere. This high level training / staff exchange programme is done with sister organizations in the United Kingdom, South Africa, Thailand, Ethiopia, India, Israel, USA and Canada for additional technical assistance and best practices.

In line with the Standard Organization of Nigeria(SON)'s requirement, FRSC decided to work towards improving quality, ensuring standards and subscribing to continuous process improvement authenticated by a third party with a global seal. The award of the ISO 9001(2008)

Quality Management System to FRSC has elevated it to the rarefied and elite group of Law enforcement Agencies and Public Institutions united in the search for excellence. The FRSC's adoption of the ISO 9001 certification Quality Management System started in 2008. As a follow up to this, the top management was trained in 2009, followed by the training of 80 officers as Internal System Auditors. Out of these, 68 qualified and 60 are proceeding to become Lead Auditors. The certification processes continued with the training programs and awareness in all formations. Meanwhile, a total of 392 processes were identified in the Quality Manual developed in accordance with the quality policy (Atubi, 2012n).

Similarly, out of over 400 driving schools nationwide 388 have registered with the FRSC, while 159 of this number have already been certified by the FRSC. The national drivers training/instructors' manual was produced to help obtain a universal form of training for drivers in Nigeria. FRSC also ensured the standardization and certification of driving schools so as to ascertain schools with the right resources and facilities. Every driving school in the country has been given a mandate to implement policy, guidelines and requirements for producing licensed drivers and also to ensure that each student has access to the Nigerian Highway Code.

CHAPTER THREE: THE STUDY AREA AND RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter provides general information on Kaduna state. This relates to information on Kaduna state history, location, climate, people, demographics, economy, tourism and education. This generally gives a perspective of the state and its position in Nigeria as a whole. It also contains the methodology of study under which types and sources of data, sampling techniques and other issues were discussed.

3.2 STUDY AREA

Kaduna state came from the old northern region in the north leaving it as the capital of north central state. Meanwhile Kaduna was further divided in 1987, creating Katsina state. Kaduna state is divided into 23 local government areas. Presently Kaduna state, north central Nigeria is politically classified as belonging to the now 'North- west' zone of the current six geopolitical zones of Nigeria (Hayab, 2014).

3.2.1 Location and Size

Located in the north-west zone of the country, on the southern end of the high plains of northern Nigeria, Kaduna state lies between latitudes $9^{\circ} 05' 56''\text{N}$ to $11^{\circ} 31' 52''\text{N}$ and longitude $06^{\circ} 04' 17''\text{E}$ to $08^{\circ} 40' 19''\text{E}$ (fig. 3.1). The entire land structure consists of an undulating Plateau with major rivers in the State including River Kaduna, River Kagom, River Gurara and Galma. Located in the north-west zone of the country, Kaduna state shares common boundaries with the Niger state to the west, Zamfara, Kastina and Kano states to the north, Bauchi and Plateau states to the east and Nassarawa state and FCT, Abuja to south. The state covers an area of 45,711.2sqKm (Nigerian National News, 2012).

The total land mass occupied by the State is estimated at 46,053 sq km which is about 5% of the total land area of Nigeria. Kaduna State is the twelfth largest State in the Country. It shares common boundaries with Niger state to the south, Plateau and Nassarawa state to the east with Katsina and Kano to the North. Kaduna State occupies part of the Central position of the Northern part of Nigeria (with Kaduna as its capital) and shares common borders with the Niger state to the west, Zamfara, Kastina and Kano states to the north, Bauchi and Plateau states to the east and Nassarawa. To the South-West, the State shares a border with the Federal Capital Territory, Abuja.

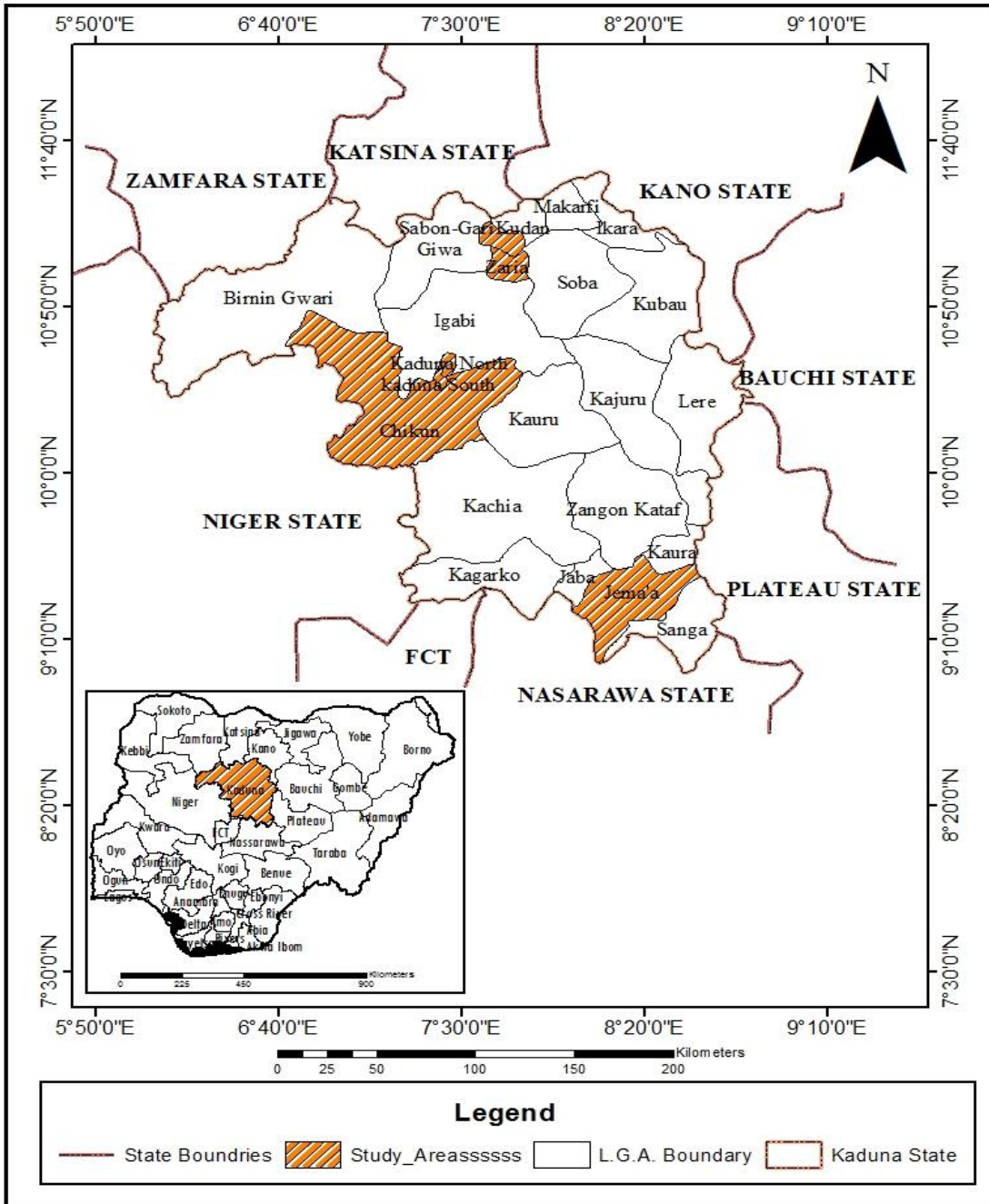


Figure 3.1: Kaduna State Map Showing the Study Areas.

Source: Modified From the Administrative Map of Kaduna State

3.2.2 Historical Perspective on Kaduna State

The word Kaduna is derived from the Hausa word 'kada' meaning crocodile. It was named after river Kaduna, which was said to be habitat for many crocodiles. Kaduna is divided into 3 Emirates, 32 chiefdoms and 345 Districts. Zaria (zazzau) is one of the ancient cities of Kaduna state with many historical relics such as the ancient defence wall of Zaria, the Gates of kofar Gaya and kofar Doka(NYSC, 2007). The state is the successor to the old Northern Region of Nigeria, which had its capital at Kaduna. In 1967 this was split up into six states, one of which was the North-Central State, whose name was changed to Kaduna State in 1976. This was further divided in 1987, losing the area now part of Katsina State. (New Nigerian Newspaper, 2012)

3.2.3 Geology and Soil

The bedrock geology of Kaduna State is predominantly metamorphic rocks of the Nigerian basement complex consisting of biotite gneisses and older granites. In the southeastern corner, younger granites and batholiths are evident.

Deep chemical weathering and fluvial erosion have developed the characteristic high undulating plains with subdued interfluves and in some places are capped by high grade lateritic ironstone especially in the northwest region of the state (Udo, 2003).

3.2.4 Climate

There are two marked seasons in the State, the dry windy season and the rainy (wet) seasons. The wet season is usually from April through October with great variations as you move North-Wards. On the average, the State enjoys a rainy season of about five (5) months. There is

heavy rainfall in the southern parts of the state like Kafanchan and northern parts like in Zaria with an average rainfall of about 1016mm. The State extends from the tropical grassland known as Guinea Savannah to the Sudan Savannah in the north. The prevailing vegetation of tall grass and big trees are of economic importance during both the wet and dry season.

3.2.5 Vegetation

The State extends from the tropical grassland known as Guinea Savannah to the Sudan Savannah in the North. The grassland is a vast region covering the Southern part of the State to about Latitude 1100'' North of the equator. The prevailing vegetation of tall grass and big trees are of economic importance during both the wet and dry season (NYSC, 2007).

3.2.6 People and Socio Economic Activities

It is a well known fact that the Kaduna state population is pluralistic in ethnic composition with rich and diverse historical and cultural heritage. The population of the state was projected with the 2006 population figure of 6,066,562 and inter census growth rate of 3.07. Using the geometric formula, $P_{t+n} = P_t (1+r)^n$, where P_{t+n} = projected population, P_t = base year population, r = growth rate and n = no of yrs, the population of Kaduna state is 7,726,821 (National Population Commission, 2009). The state has a population density of 130 people per square kilometer. It accounts for 4.3% of Nigeria's total population. It is a well known fact that Kaduna state population is pluralistic in ethnic composition with rich and diverse historical and cultural heritage (2006 population figure). The major ethnic groups found in the state includes: Hausa, Fulani, Gbagyi, Atyap, Jaba, Kaninkon, Kadara, Chawai, Attakar, Gure, Ikulu, Kurama, Kagoma, Ninzam, Kahugu, Kagoro, and Moro'a. English and Hausa languages seem to be official languages widely spoken in the state. Other ethnic communities in Kaduna state are

Adara, Ham, Bajjuu, Ninkyob, Koro, Zango Kataf, Mada and Agworok communities (NYSC, 2007).

Agriculture is the main stay of the economy of Kaduna state with about 80% of the people actively engaged in farming. Cash and food crops are cultivated and the produce includes: yam, cotton, groundnut, tobacco, maize, beans, guinea corn, millet, ginger, rice and cassava. Over 180,000 tones of groundnut are produced in the state annually. The major cash crop is cotton which the state has a comparative advantage as it is the leading producer in the country. Another major occupation of the people is animal rearing and poultry farming. The animals reared include cattle, sheep, goats and pigs (NYSC, 2007).

Kaduna state is a metropolitan as well as a cosmopolitan industrialized state with over 80 commercial and manufacturing industries. Goods ranging from carpets, textiles, reinforced concrete materials, bicycles assembly, toiletries and cigarettes in the state. Consumer goods produced range from dairy products to soft drinks, flour and groundnut oil. Major industries in the state are the Federal Super Phosphate Fertilizer Company PLC, Ideal Flour Mills PLC, New Nigerian Packaging Company PLC, Peugeot Automobile Nigeria PLC, United Wire Products Limited, Kaduna Furniture and Carpets Company Limited, Electricity Meters Company Nigeria Limited. There is also the Nigerian Institute of Leather and science technology, Zaria, the Defense Industries Corporation of Nigeria and the nation's third petroleum refinery are also located in Kaduna State.

3.2.7 Accident and Transport Related Issues

Kaduna state road network is majorly owned and maintained by the state government and the drivers that ply these roads largely constitute privately owned vehicles, taxis, omni and kombi commercial buses. However, the generally low level of education of many of the drivers of commercial buses and the fact that they received their driver's training in private lessons cast doubt on the seriousness of the driving tests which have to be passed to obtain a license. It has been observed that accidents were most often caused by excessive speed and driver recklessness and negligence, rarely by mechanical defects (Ogunjumo, 1995). This has necessitated the need for a deep involvement of FRSC in the state. In Kaduna state, about 700 FRSC officials are resident in 9 units of the state and these units are represented in the local government headquarters. This has facilitated proper training and retraining of drivers, rigorous and thorough testing procedures, enforcement of the driving rules and regulations, and extensive research on road safety are amongst the measures (FRSC, 2009)

3.3 METHODOLOGY OF RESEARCH

This section discusses the types of data collated, sources of data collated and sampling technique used in this research work.

3.3.1 Types of Data utilized

- i. Accident reduction strategies of FRSC in the study area.
- ii. Number of control and patrol equipments available for accident reduction.
- iii. The level of compliance of road users with road traffic regulations.
- iv. Number of FRSC staff employed between 1993 and 2013
- v. Number of years of working experience of FRSC officials and drivers

- vi. Frequency of daily occurrence of accidents.
- vii. Data on the time of the day and year that accident is common.

3.3.2 Sources of Data

3.3.2.1 Primary sources of data

Questionnaire was administered to FRSC staff and commercial vehicle drivers to obtain information for the research. These contain relevant and well structured questions aimed at getting responses that address the objective questions of the study. The questionnaire contained open and closed ended questions to obtain detailed information. Information such as age, educational status and number of years of working and driving of FRSC staff and commercial drivers were obtained. Also unstructured interviews were conducted on drivers and FRSC to measure their attitude towards issues pertaining to the research aim. Also, general observation was made on respondents and the field.

3.3.2.2 Secondary sources of data

Secondary data was obtained majorly from documents of FRSC, past related research works (published and unpublished), journals, bulletins, magazine, conference papers and internet data among others. Information collected includes road traffic accident data, enforcement agencies and available facilities among others.

3.3.3 Sample Size and Sampling Technique

Systematic and purposeful sampling technique was used to administer copies of questionnaire to every third respondent encountered on the field. This applied to both FRSC staff

and commercial drivers at motor parks. This is because the determining basis of selection is similar to all population hence; any respondent could provide the information needed. Table 3.1-3.4 present the processes of selecting the respondents across the zones in the study area.

TABLE 3.1: FRSC UNITS IN KADUNA STATE

UNIT CODE	UNIT NAME	NO OF OFFICERS	NO OF MARSHALS
RS 1.1	Kaduna	55	120
RS 1.11	Kafanchan	19	47
RS 1.12	Birnin Gwari	16	38
RS 1.13	Zaria	27	70
RS 1.14	Saminaka	13	32
RS1.15	Sabon- Tasha	14	51
RS 1.16	Kakau	20	56
RS 1.17	Birnin Yero	17	40
RS 1.18	Gwantu	9	30
Total		190	484

Source: FRSC, Kaduna State (2013)

Table 3.1 gives the total number of FRSC staff in each unit represented in Kaduna State. The units with the highest number of staff out of the nine FRSC units were chosen to represent Kaduna state as a whole. The units with the highest number of staff are Kaduna metropolis with a staff strength of 175, Zaria, 97, Kakau, 76 and Kafanchan, 66.

The units with the highest number of staff coincidentally happen to be located in regions that are mostly populated and they have the highest frequency of vehicle movements, hence are prone to more accidents. Considering this, it is valuable to assess these units so as to give a substantial representation of FRSC staff and to ascertain the road traffic enforcement capacity in the state.

TABLE 3.2: SELECTED FRSC UNITS IN KADUNA STATE

UNIT CODE	UNIT NAME	AVAILABLE NO OF OFFICERS	NO OF SELECTED OFFICERS	AVAILABLE NO OF MARSHALS	NO OF SELECTED MARSHALS
RS 1.1	Kaduna	55	17	120	40
RS 1.13	Zaria	27	8	70	23
RS 1.16	Kakau	20	6	56	19
RS 1.11	Kafanchan	19	6	47	10
Total		121	37	293	92

Source: FRSC, Kaduna State (2013)

Available record from the FRSC reveals total staff strength of 674 from all units of FRSC in Kaduna state. From the total number of officials from the selected four units, 20% is chosen to be the actual number of questionnaires administered. Therefore, from Table 3.2, the no of selected officers and marshals from the four units represents 20%. Approximately, a total of 129 copies of questionnaire were administered to FRSC officials in Kaduna, Zaria, Kafanchan and Kakau (Table 3.2).

TABLE 3. 3: COMMERCIAL DRIVERS OF SELECTED UNITS OF KADUNA STATE

MOTOR PARKS	AVERAGE NO OF VEHICLES PER DAY	NO OF DRIVERS SAMPLED
Kawo park, Kaduna	255	51
Kwangila Park, Zaria	88	18
Abuja Garage, Kakau	35	7
Main Park, Kafanchan	43	9
Total	421	85

Source: NURTW, Kaduna state. (2013)

Generally, it was observed that the major road users that are found on Nigerian roads are pedestrians, bicycle riders, motorcyclists, private vehicle drivers and commercial vehicle drivers. For the purpose of this study, commercial vehicle drivers served as respondents due to the fact that they are available at motor parks and their use of the highway is more frequent than other road users. Respondents were selected also from the four major chosen units of the state namely Kaduna, Kakau, Zaria and Kafanchan. (Table 3. 3)

About 20% of the number of vehicles that operate in these garages amount to the number of questionnaires that was administered to drivers. Approximately, 85 drivers representing the population of the vehicles that operate at the selected motor parks in the study area were sampled. A survey was conducted on these drivers so as to have knowledge of their view on the role of Federal Road Safety Corps. Commercial vehicle drivers were chosen as respondents because among all the road users they have the highest number of movements on these roads on a daily basis and they are readily available and accessible (Table 3.3). Furthermore, the choice of

20% of population size for both FRSC staff and commercial drivers was made because the population size is small, therefore 20% is quite a representative sample size.

The total number of respondents is stated as follows:

Table 3.4 Distribution of respondents

Total no of FRSC officials		Total no of commercial drivers	
1. Kaduna-	57	1. Kaduna-	51
2. Zaria-	31	2. Zaria-	18
3. Kakau-	25	3. Kakau-	7
4. Kafanchan-	16	4. Kafanchan-	9
Total	129		85

Source: author's survey (2014)

3.3.4 Methods of Data Analysis

To characterize the commonest period of accidents in the state, frequency, percentages were calculated and presented in tables and charts. Analysis and discussion of data on enforcement equipments were done using the T- Test statistics and P- values and the results were presented in bar charts and tables. Chi-square was used to analyse the perception of commercial vehicle drivers and FRSC on accident reduction strategies measured by Likert scale. To examine the working conditions and enforcement capacity of FRSC in reducing accidents, analysis techniques such as chi- square and p values were adopted. All the findings were presented in tables and bar charts.

CHAPTER FOUR: DATA ANALYSIS AND

PRESENTATION OF FINDINGS

4.1 INTRODUCTION

This chapter explains how data obtained from the research field are analyzed. Data on socio- demographic characteristics of respondents, period of accident occurrence, traffic enforcement equipments and accident reduction measures are analyzed. The findings from the analysis are also discussed extensively relating them to set objectives.

4.2 SOCIO- ECONOMIC ATTRIBUTES OF RESPONDENTS

Information on the age distribution of FRSC officials was obtained so as to ascertain their level of reasoning and understanding of the task of traffic law enforcement. Without this, it will be impossible to know if they are mentally fit and responsible for their respective positions. Also, it is necessary to ascertain whether staff employed are minors or overage.

The age distribution of commercial drivers was also obtained so as to determine if they have attained the universally acceptable age to drive. The age distribution of the respondents (FRSC staff and commercial drivers) is shown in table 4.1. 34.1% of FRSC staff are of the age range of 30- 34years which has the highest frequency implying that majority of the FRSC workers are young officers who have probably spent few yrs in service. Indeed, an examination of the result indicates that in all, over 68.3% of the FRSC officials are within the age bracket of 20- 34years. However, no FRSC worker was found to be less than 20 years. This can be explained by the fact that it is not acceptable to employ anybody less than 19yrs for a road safety

job in Nigeria. Also, FRSC staff retire from service at 60yrs and this is the reason that no respondent was of that age.

Table 4.1: Age Distribution of FRSC staff and commercial drivers.

Age range	FRSC Staff		Drivers	
	Frequency	Percent	Frequency	Percent
≤19years	0	0	0	0
20-24years	20	16.3	8	9.5
25-29years	22	17.9	14	16.7
30-34years	42	34.1	20	23.8
35-39years	12	9.8	20	23.8
40-44years	7	5.7	13	15.5
45-49years	17	4	4	4.8
50-54years	1	3	3	3.6
55-59years	2	2	2	2.4
60years and above	0	0	0	0
Total	123	100	84	100

Source: Author's survey(2014)

For commercial drivers, 23.8% respectively fall within the age range 30- 34years and 35-39 years. This constitutes the highest frequency implying that majority of the commercial drivers are young, sound and old enough to drive a commercial vehicle. However, very few of the drivers (2.4%) were found to be 55years and above. This implies that the elderly people are not attracted to the driving profession. Also, the elderly ones cannot cope with the rigors of commercial driving. Health issues such as bad eye sight and high blood pressure are mostly associated with people that are 50yrs and above and this is why they hardly go into commercial driving.

Table 4.2 shows the educational status of FRSC officials and commercial drivers. The level of education gives us an indication of their knowledge and level of intellect. It also gives an

indication of how well they can understand and implement given tasks as road safety agents. Furthermore, the educational status of commercial drivers was obtained to provide an understanding of their level reasoning.

The findings as presented in table 4.2 reveals that majority of the FRSC workers are secondary school certificate holders (35%). However, analysis of the result shows that about 65% of the workers possess some level of post secondary qualification such as OND, HND and university certificates. This implies that virtually all the FRSC officials are educated. This level of education might influence their understanding of road safety enforcement rules and regulations. Also, 40.4% of commercial drivers have some form of formal education while 33.4% have no formal education. This implies that some of these drivers may not be able to read and interpret road signs and symbols appropriately which is paramount to road safety.

Table 4.2: Educational status of FRSC staff and commercial drivers

	FRSC Staff			Drivers	
	Frequency	Percent		Frequency	Percent
Secondary	43	35	No education	4	4.8
OND	38	30.9	Qur'anic	24	28.6
HND	15	12.2	Primary	22	26.2
University	21	17.1	Secondary	27	32.1
Others	6	4.9	Tertiary	7	8.3
Total	123	100	Total	84	100

Source: author's survey (2014)

Table 4.3 shows the years of working experience of FRSC staff and the years of driving of commercial drivers. This is necessary to ascertain their level of expertise in their jobs given the number of years that has been spent. It shows the frequency and percentage of the number of

working years for FRSC staff and the number of years of driving experience for commercial drivers in Kaduna state.

Table 4.3: Number of Years of Working/Driving Experience

	FRSC Staff		Drivers	
	Frequency	Percent	Frequency	Percent
Less than 2yrs	33	26.8	0	0
2yrs-4yrs	23	18.7	8	10.1
5yrs-7yrs	20	16.3	8	10.1
8yrs-10yrs	15	12.2	17	21.5
11-yrs-13yrs	14	11.4	8	10.1
14yrs-16yrs	8	6.5	10	12.7
17years-19yrs	7	5.7	9	11.4
20yrs and above	3	2.4	19	24.1
Total	123	100	79	100

Source: Author's survey (2014)

61.8% of FRSC staff had worked for 0- 7years while 38.2% have worked for 8years and above. This means that the largest percentages constitute the lowest years of working experience and vice versa. With the above information, FRSC does not have enough experienced hands to battle road traffic accidents.

For drivers, 41.7% had been driving for 0- 10years while 58.3% had been driving for 11years and above. Subsequently, the higher the number of years in driving, the greater the experience and expertise. Therefore, 58.3% have experience in driving and are more conversant with road safety rules and regulations and traffic signs.

Figure 4.1 depicts the number of staffs employed by FRSC from 1993 to 2013. This is necessary to know if the number of staffs employed annually is sufficient to help solve road safety problems in the state.

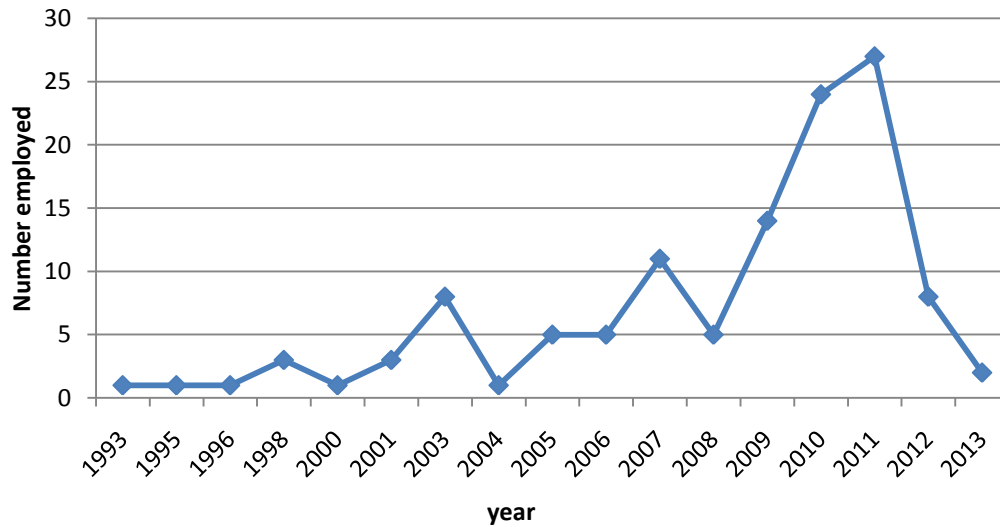


Fig 4.1 Number of employed FRSC staff each year

Source: Author's survey, 2013

In the year 2011, the highest number of staff (27) was employed and this drastically declined to 8 and 2 in the year 2012 and 2013 respectively. This shows an obviously insufficient recruitment of staff into FRSC. There is not a commensurate number of staff to the state of road safety in the state.

4.3: Road Traffic Accident Data in Kaduna State

Accident data of Kaduna State was obtained primarily to ascertain the trend of Road Traffic Accident data in the state and to examine whether the activities of Federal Road Safety Commission is a contributory factor to this trend as shown in figure 4.2.

Table 4.4: Road Traffic Accident data in Kaduna State from 2004- 2013

Year	Accident cases
2004	703
2005	573
2006	968
2007	968
2008	463
2009	1328
2010	1733
2011	90
2012	336
2013	1046

Source: FRSC (2013)

The period of Road Traffic Accident obtained from FRSC spans from 2004 to 2013.

The trend of Road Traffic Accident occurrences in Kaduna State was computed majorly to analyse whether accidents has been increasing or decreasing over the past 10years.

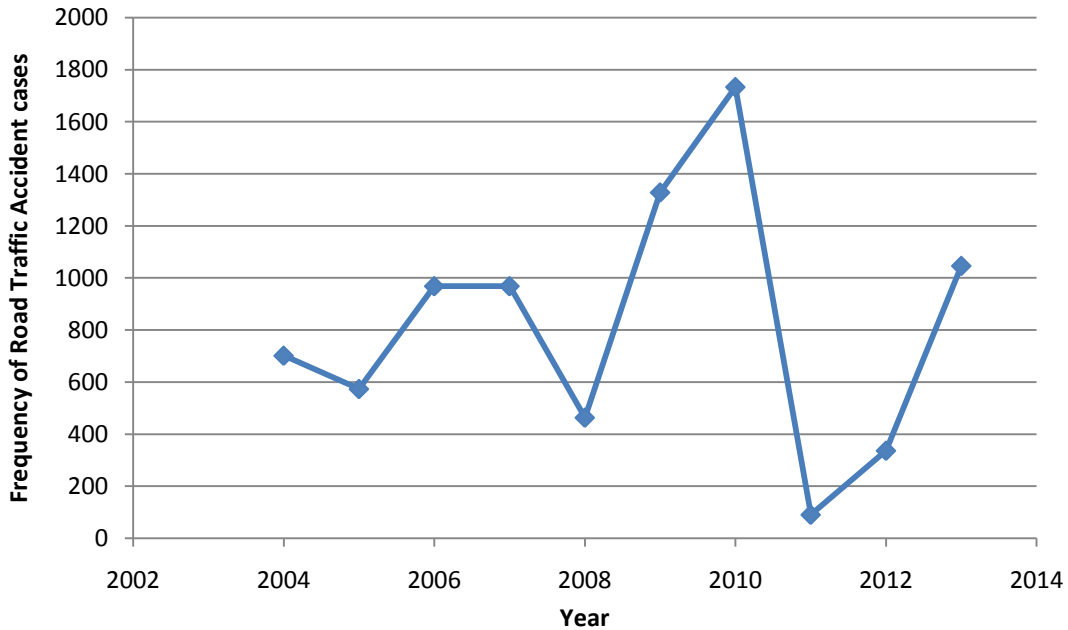


Fig 4.2: The trend of Road Traffic Accidents occurrence in Kaduna state

Source: Author’s survey, 2015

The trend graph as shown in Figure 4.2 shows that the lowest case of Road Traffic Accidents was in 2011 in which 90 cases were recorded and the highest number of accidents recorded was 1733 and this was in 2010. From the year 2006 to 2007, there was no increase or decrease in the number of accident cases due to the fact that the figure remained at 968 for the two years.

The year 2011 from Figure 4.1 and Figure 4.2 shows a causal relationship in which there is a high possibility that the increased employment rate is responsible for the sharp decline in accidents rate. From this discovery, it is therefore paramount to note that the number of FRSC officials deployed to any part of the state will affect the number of accident cases.

Also, from figure 4.1, the number of FRSC staff employed remains the same in 2006 and 2007 and from figure 4.2, the number of accident also remains the same in the two years.

4. 4 COMMONEST PERIOD OF ACCIDENTS

The occurrence of traffic accidents vary on daily, weekly, monthly and on seasonal basis. Table 4.5 shows the period of occurrence of accidents. The information about period of accident occurrence is necessary so as to know how and when to prepare against accident during such periods beforehand.

Table 4.5: Period of the year/season that accidents are common

Period/ season	Frequency	Percent	
April- October(wet season)	96	78	
November- February(dry season)	9	7.3	
March(hot season)	4	3.3	P-value: 0.001**
No specific season	14	11.4	
Total	123	100	

** indicates significance at 5% level (i.e. p -value < 0.05).

Source: author's survey, (2014)

The result in table 4.5 indicates that the wet season, that is between April and October is the period with the highest occurrence of accidents. This is because of the factors associated with the rainy season. Such factors include slippery road surface, blurred vision due to heavy clouds, potholes and ditches filled with water after a rainfall, insufficient facilities for road traffic enforcement during the rainy season and all other risks associated with the rainy season. With these factors still in place, accidents will definitely increase during the wet season.

Similarly, the diurnal occurrence of accidents also shows that most accidents occur at night (figure 4.2), the time of the day that accident is common is obtained so as to prepare against accident at such times.

This may be due to the fact that there may be no or fewer FRSC officials on patrol at night and poor lighting facilities for vision to drive at nights. Secondly, accidents are also common in the morning because of the peak period of movements to schools, offices and businesses and as a result, the number of vehicles on the road will increase during this period.

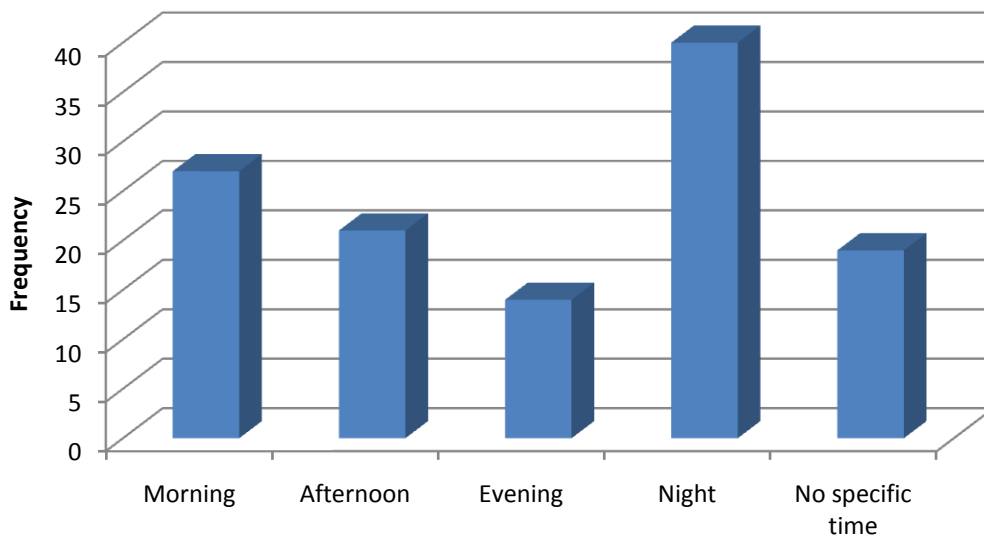


Fig 4.3: Time of the day that accident is common

4.5 ENFORCEMENT EQUIPMENTS FOR ACCIDENT REDUCTION

There is need to know how effective FRSC enforcement equipments are because this determines their performance in curbing road traffic accidents.

In an attempt to determine the condition of the available equipments, the FRSC workers were asked to provide their assessment of their equipments from very good to poor. This will help to determine if there is need for repair or replacement of such equipments to ensure proper enforcement of traffic rules on the road. Table 4.5 shows the condition of available equipments.

Table 4.6 Condition/state of available equipments

	Rating	Frequency	Percent
Very good	> 70	17	14
Good	50- 69	58	47.9
Fair	40- 49	36	29.8
Poor	< 40	10	8.3
Total		121	100

*** indicates significance at 5% level (i.e. when $X^2-cal > X^2-tab$ or $p-value < 0.05$).*

Source: author's survey(2014)

Table 4.6 shows that 47.9% of FRSC officials believe that the available facilities are in good condition which means that they can be used when needed and necessary while 29.9% of FRSC officials believe that these facilities are in a fair condition. This indicates that there are still some repairs and replacements to be done.

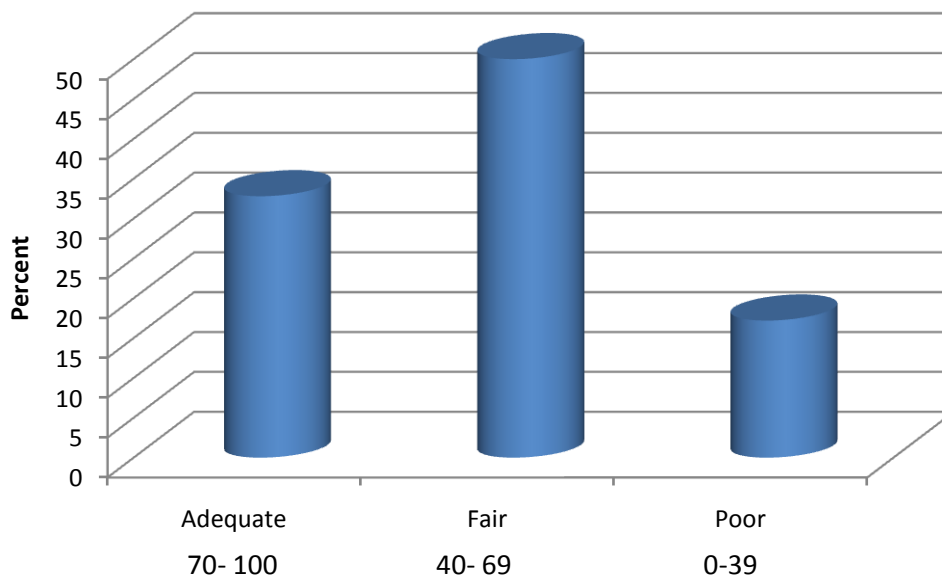


Fig 4.4: Level of provision of enforcement facilities

Figure 4.5 depicts the level of provision of enforcement facilities. As regards the provision of the enforcement facilities, the highest proportion of the FRSC officials agreed that the level of provision of facilities is fair (47%). However, a fair level of provision doesn't

guarantee safety on the road. To ensure road safety, the need for adequate equipments cannot be compromised or overemphasized.

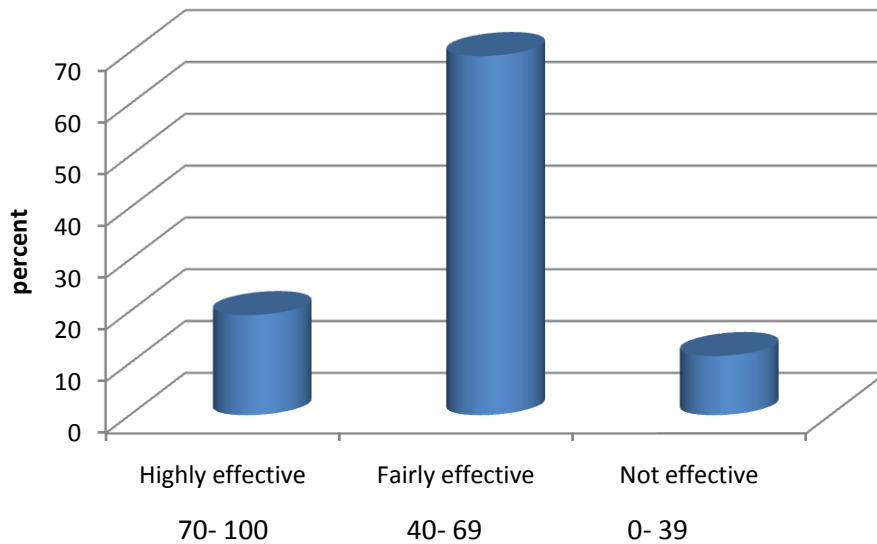


Fig 4.5: Rating of the effectiveness of available equipments

Figure 4.6 show that 65% of the respondents agreed that available enforcement equipments are fairly effective. It is however instructive to note that very small proportion of respondents are of the view that available enforcement equipments are of high effectiveness.

With the equipments rated as fairly effective, there is the need to maintain and add more standard equipments to the available ones. Without an effective set of equipments, an accident free situation cannot be achieved on the roads.

Table 4.7 presents a list of items required to enforce traffic rules, available and the quantity in working condition. A cursory examination of table 4.6 reveals that the total number of equipment types needed in Kaduna unit is 98 while the actual available equipments account for 38. Similarly, a total of 56 equipment types are required in Zaria unit. However, only 8 of these equipments are available. It is important to note here that the same scenario is applicable to

Kafanchan and Kakau units. Furthermore, in some of the units under investigation, some of the available equipments are not in working condition especially Kaduna and Kafanchan units (table 4.7). The result as presented indicates that the ability of FRSC units in the study area to effectively enforce traffic regulation is greatly hampered.

Table 4.7: Record of enforcement equipments

Enforcement equipments	No. Required				No. Available				No in working condition			
	Kaduna	Zaria	Kafanchan	Kakau	Kaduna	Zaria	Kafanchan	Kakau	Kaduna	Zaria	Kafanchan	Kakau
(a) Patrol vans	4	4	3	4	4	2	1	2	2	2	1	2
(b) Road side clinics	2	2	2	2	2	0	0	1	2	0	0	1
(c) Ambulance	3	3	2	2	1	0	0	0	1	0	0	0
(d) Breathalyzers	5	4	4	6	0	0	1	2	0	0	1	2
(e) Computers	10	5	5	2	0	2	2	1	0	2	2	1
(f) First aid kits	5	4	4	2	0	2	0	0	0	2	0	0
(g) CUG(phones)	10	6	4	5	8	2	3	4	8	2	3	4
(h) cranes	3	1	1	1	1	0	0	0	1	0	0	0
(i) Speed trailers	1	1	1	1	0	0	0	0	0	0	0	0
(j) Radar guns	3	10	1	2	0	0	0	0	0	0	0	0
(k) Patrol bikes	15	4	1	1	10	0	0	0	10	0	0	0
(l) Traffic camera	3	4	1	3	0	0	0	0	0	0	0	0
(m) Pub. add system	4	4	2	2	2	0	0	1	2	0	0	1
(n) Walkie- talkie	30	4	10	15	10	0	4	5	10	0	3	5
Total	98	56	41	48	38	8	11	16	36	8	10	16

Source: FRSC, Kaduna State

According to table 4.8, the result was subjected to further statistical analysis using student T- test and it indicates that a comparison of the number of equipments available and the number actually required for Kaduna unit shows that $t= 4.286$, $p= 0.042$. This indicates that the difference is statistically significant. Similarly, the difference between the paired equipment variables reveals that the t- test results for all the locations are statistically significant (see table 4.8).

Table 4.8 : T- Test statistic for record of enforcement equipments

	Kaduna	Zaria	Kafancha n	Kakau
No. required vs No. Available	4.28571** (0.042)	3.42857** (0.000)	2.14286** (0.000)	2.14286** (0.007)
No. Available vs No. in working condition	0.14286 (0.944)	0.000 (1.000)	0.07143 (0.336)	0.07143 (0.336)

*The first figures without the parentheses are mean differences. The ones in parentheses are the p-values. ** indicates significance at 5% level.*

Source: Author's survey(2014)

From the above described results, the number of equipments required outweighs the available ones. This implies that FRSC staff aren't well provided with the required quantity of equipments necessary for road monitoring. This could be the fault of the government or FRSC by not getting world class enforcement equipments.

An examination of the paired difference between the number of available equipments and number in working condition indicates that the differences are not statistically significant. For instance, the paired difference for Kaduna shows that $t= 0.143$, $p= 0.944$. Similarly, the result for

Zaria indicates that $t = 0.001$, $p = 1.000$. The result for Kafanchan and Kakau also reveals that the differences are not statistically significant (table 4.7).

4.6 MEASURES ADOPTED FOR ACCIDENT REDUCTION

There are several strategies for accident reduction. These measures are standard techniques for accident reduction and general road safety. Table 4.8 shows the different strategies that FRSC has put in place for accident reduction in Kaduna state. This is paramount in order to know how best to improve on them and to identify what strategies need re-evaluation.

Table 4.9: Measures instituted for accident reduction in the state

	Frequency	Percent
Public enlightenment programs	48	39.3
Workshop and training of road users	13	10.7
Search and rescue services	3	2.5
24hr patrol and monitoring services	13	10.7
Apprehension and fining of road traffic offenders	1	0.8
Road safety curriculum in schools	3	2.5
Data management	2	1.6
Drivers' training	9	7.4
Vehicle inspection	5	4.1
All of the above	25	20.5
Total	122	100

Source: Author's survey

Table 4.9 indicates that majority (39.3%) of the FRSC workers agreed that public enlightenment program is the most widely used technique for accident reduction. This finding implies that there is need for an effective, up to date and programme awareness among the

general public about the requirement for road safety and accident reduction. Also, 0.8% of FRSC workers interviewed see apprehension of traffic offenders as the least measure employed. This implies that this is probably one of the reasons for the unabated road accident occurrences in Kaduna state. If traffic offenders are not always apprehended and fined, there will always be a repeat of such offences and consequently there will be accidents. There is therefore a strong need to review policies associated with traffic offenders and their due punishment. The total number of respondents is 129 from which 7 of the respondents did not respond at all to questions related to accident reduction measures.

In order to determine the effectiveness of these accident reduction techniques, the respondents were asked to assess how effective the measures are. Figure 4.7 shows the level of effectiveness of the measures put in place by FRSC. This is necessary in order to know if other strategies should be added to the ones on ground so as to achieve effectiveness.

Figure 4.7 shows that 70% of FRSC workers believe that the strategies put in place are highly effective. The strategies believed to be highly effective are those listed in table 4.9 of which public enlightenment programs take the lead. However, despite the belief of FRSC in the effectiveness of these measures, accidents are still occurring. This shows that the measures on ground are not adequate and that not only these established accident reduction measures will ensure proper results.

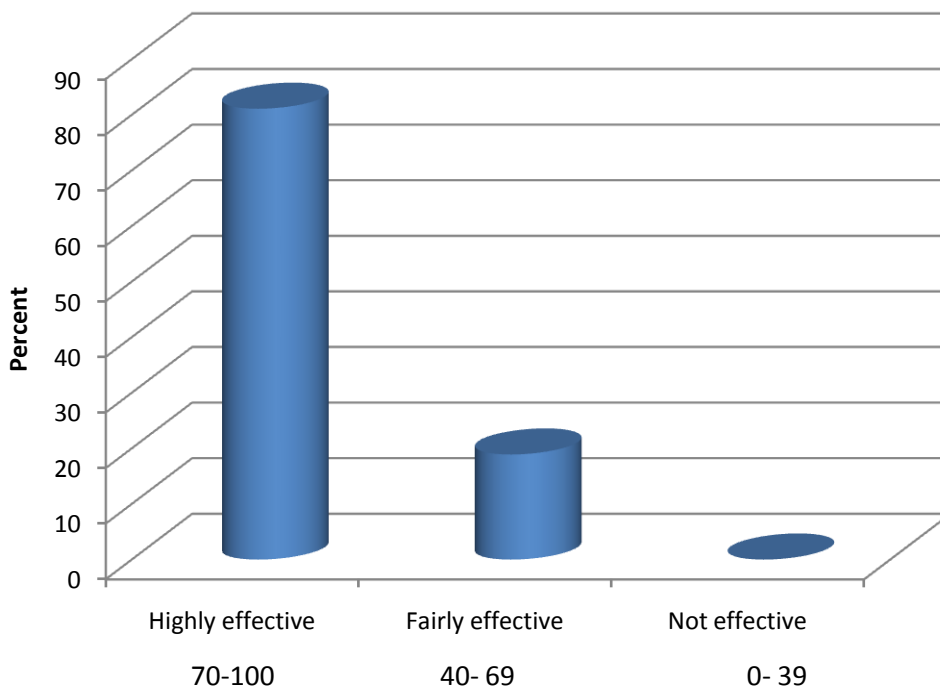


Fig 4.6: The effectiveness of strategies put in place for accident reduction

The perception of commercial drivers on the activities of FRSC officials is revealed in table 4.10. This is necessary so as to know the perception of drivers about FRSC and to ascertain how well they can be obeyed.

Table 4.10: Perception of activities of FRSC officials on patrol by drivers

	Frequency	Percent
They control traffic when there's a serious traffic hold up	1	1.2
They arrest over speeding drivers	6	7.2
They arrest drivers that don't use seatbelts	2	2.4
They inspect vehicles	2	2.4
They check drivers' license	17	20.5
They arrest drivers with over loaded vehicles	4	4.8
All of the above	51	61.4
Total	83	100

Source: Author's survey (2014)

The frequency and percentage of the perception of commercial drivers on the activities of FRSC officials is shown in table 4.10. This findings show that 61.4% of drivers believe that FRSC officials perform all the above listed activities. Only 1.2% of drivers believe that they control traffic when there is a serious hold up. This may be because the motor traffic division of the Nigerian police is saddled with this responsibility. However, because of the major focus of FRSC, which is road safety, there should be collaboration with other road transport agencies in order to ensure free movement of vehicles and pedestrians for the purpose of creating an accident free environment. The total number of respondents (drivers) is 85. From table 4.9, only 83 drivers responded showing the reason for a lapse of 2.

4.7 ENFORCEMENT CAPACITY AND WORKING CONDITIONS OF FRSC FOR ACCIDENT REDUCTION

The enforcement capacity and working conditions of any road traffic agency tells a lot about effectiveness of their performance. Table 4.11 shows the frequency of night patrols by FRSC staffs. This is necessary in order to ascertain their commitment to ensure accident free roads at nights. According to the findings of this study, the time of the day that accident is common is at night. This necessitates the need to know how frequently FRSC is involved in night patrols.

Table 4.11: Frequency of night patrol by FRSC officials in the state

	Frequency	Percent
Daily	52	43.3
Weekly	33	27.5
Bi-weekly	1	0.8
Monthly	20	16.7
Others	14	11.7
Total	120	100

Source: Author's survey (2014)

Majority (43.3%) of FRSC officials claim that they are involved in daily night patrols. This implies that FRSC officials are mostly on standby daily while 0.8% believes that they are involved in bi-weekly night patrols. From the findings of this work, it can be said that accidents still occur at night despite claims of daily night patrols by FRSC. Therefore, there is need to check all possible causes of accident and ensure that permanent solutions are proffered.

Different gadgets are required for an effective and efficient traffic monitoring both day and night. For instance, it is expected that special gadgets such as patrol lights, patrol vehicles, ambulances e.t.c. are needed to facilitate night patrols .Table 4.12 shows the facilities required for night patrols. This information was obtained in order to ensure that FRSC are aware that their operations at nights should be done with these facilities in place.

The result shows that 36.9% of the respondents believe that all facilities mentioned in table 4.12 are required for night patrol. According to the respondents, all mentioned facilities are considered to be important to ensure proper night patrols. This implies that all these facilities should be readily available given the daily night patrols are important. From the above result, only 120 FRSC officials gave valid responses on the questionnaires while 9 of them did not.

Table 4.12: Facilities required for night patrol in the state

	Frequency	Percent
Patrol lights	11	9
staff security facilities	37	30.3
Reflective jackets	14	11.5
Patrol Vehicles	9	7.4
Ambulances	6	4.9
All of the above	45	36.9
Total	122	100

Source: Author's survey (2014)

The record of equipments available as revealed in table 4.7 shows that the equipments available for night patrol are inadequate. Such equipments are ambulances, patrol vehicles, first aid kits, radar guns and walkie- talkie. Consequently, this poses a setback for FRSC on the issue of effectiveness while on night patrol.

The working conditions of any organization's workforce are paramount to the overall output of such organization. Figure 4.8 show the desired better working conditions of FRSC staff. From this, 38.5% of the FRSC officials believe special allowances will improve their working condition while 27.9% desire salary increase. Special allowances include those set apart for special duties such as working a night, extra time at work and working at remote parts of the State. Only 5% desire security while at work. This is because they probably do their road patrols in places where there are no security threats. However, there should be security facilities to help secure the lives of FRSC staff.

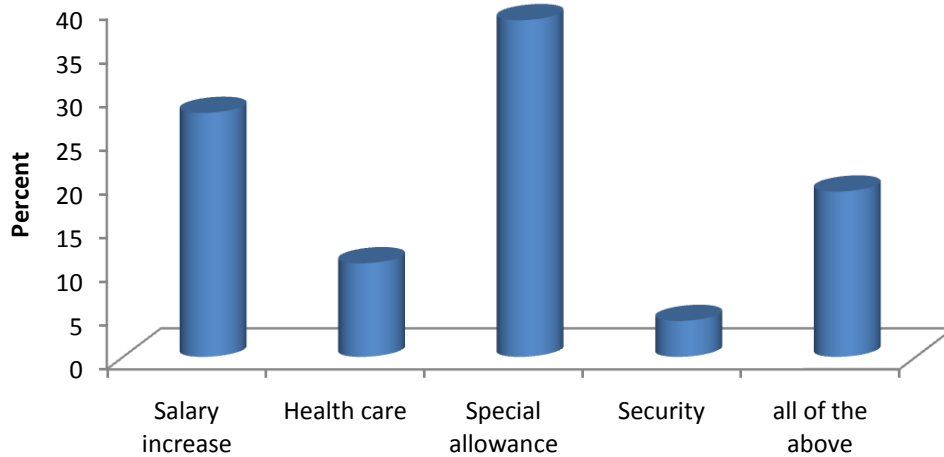


Fig 4.7: Better working condition desired as an enforcement agent

4.8 LEVEL OF COMPLIANCE

The degree of compliance to traffic rules varies from one state to another, from one region to another and from one country to another. Table 4.13 shows the level of compliance of road users to traffic rules. This is needed to determine the rate of compliance as related to the overall state of road safety in Kaduna state.

It is apparent that 54.9% of FRSC officials generally agreed that the compliance of road users to traffic rules is fair. This is because there is not enough education and public awareness about traffic rules and regulations and its implications. This should not be, knowing that public enlightenment program is a major strategy that FRSC claims to use to curb accidents. The underlining issue is some drivers' poor understanding of traffic rules and regulations. This could be as a result of poor distribution of enlightenment programs or the unlearned state of some drivers. Also, many of the commercial drivers might not have passed through authorized driving schools to obtain drivers' license.

Table 4.13: Level of compliance of road users to traffic rules and regulations in the state

	Frequency	Percent
Excellent (21- 30)	28	23
Fair (11- 20)	67	54.9
Poor (0-10)	27	22.1
Total	122	100

Source: Author's survey (2014)

However, there is a need not only to sample the opinions of FRSC staff but also to obtain information from drivers too so as to reach a balance in the findings. Table 4.13 presents the responses of drivers on this.

Using Likert- type scales, the drivers were asked to rank their knowledge and perception of FRSC's contribution to accident reduction and maintaining traffic discipline. Table 4.14 shows the level of knowledge and perception of drivers about the effectiveness of FRSC in reducing accidents. Also, it shows the perception of drivers about their attitude to traffic rules and regulations.

Table 4.14 Drivers Knowledge on roles of FRSC

	Total	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Chi-Square(X^2)
FRSC is effective in reducing accidents	84	48 (57.1)	19 (22.6)	3 (3.6)	1 (1.2)	13 (15.5)	85.286 (0.000)**
FRSC has helped to maintain traffic discipline on the roads	84	58 (69)	17 (20.2)	5 (6)	1 (1.2)	3 (3.6)	135.524 (0.000)
As a driver, you know little of traffic rules and regulations	83	1 (1.2)	5 (6)	8 (9.6)	22 (26.5)	47 (56.6)	84.651 (0.000)**
Disobedience of road traffic rules are a major cause of accidents	83	55 (66.3)	14 (16.9)	6 (7.2)	1 (1.2)	7 (8.4)	116.217 (0.000)**

*the figures in parentheses are the p-values. Each row has df of 4, therefore the X^2 tabulated value at 5% level with 4 df is 9.49. ** indicates significance at 5% level.*

Source: Author's survey

The result indicates that 57.1% of the drivers strongly agreed that FRSC are effective in reducing accidents while 1.2% disagreed. With this result, majority of the drivers believe that they are effective. Therefore, the hope of collaboration with FRSC in ensuring road safety is positive by completely complying with traffic rules and regulations.

Similarly, 69% of the drivers strongly agreed that FRSC have helped to maintain traffic discipline on the roads while 1.2% disagrees. Majority of the drivers strongly believe that FRSC helps to ensure traffic discipline on the roads. This implies that they play a major role in ensuring that the roads are free of accidents. There is a need therefore to ensure continual and increased discipline on the roads.

Also, 56.6% of the drivers strongly disagree that they know little of traffic rules and regulations while 1.2% strongly agree. Majority of the drivers do not agree that they know little of traffic rules. This is because they hardly even attended driving schools nor know what traffic rules and regulations mean.

Incidentally, 66.3% of the drivers strongly agree that disobedience of traffic rules and regulations are a major cause of road accidents while 1.2% disagrees. Majority of the drivers agree that disobedience of traffic rules causes accidents. Examples of such rules are the use of seatbelts, obeying road signs and traffic lights and proper use of road lanes. Inevitably, disobedience to such rules will increase accidents. This result calls for stricter measures to ensure total enforcement of traffic rules and regulations. However, this also means more FRSC staffs need to be employed and positioned at strategic locations in the state.

CHAPTER FIVE: SUMMARY OF FINDINGS, RECOMMENDATION AND CONCLUSION

5.1 Summary of findings

During the course of this research work, the following results were generated and it reveals the following:

- i. FRSC record reveals that 61.8% of members of staff had worked for 0- 7years while 38.2% had worked for 8years and above. Also, 41.7% of drivers had been driving for 0- 10years while 58.3% had been driving for 11years and above.
- ii. The highest occurrence of accidents in Kaduna state is found between April to October which signifies the rainy season in the state. Also, most accidents have been observed to occur at night.
- iii. The number of enforcement equipment required in Kaduna unit of FRSC is 98 while only 38 equipments are available. However, in Zaria, FRSC requires 56 number of equipments but possess only 8 in number.
- iv. The T test statistic for record of enforcement equipments revealed that a difference between the number of equipment required and the number available is statistically significant with values at $t= 4.286$ and $p=0.042$. Also, the paired difference between the number of available equipments and number in working condition in Kaduna shows that $t= 0.01$ and $p= 0.944$ and in Zaria, $t= 0.001$ and $p= 1.000$ and these are not statistically significant.
- v. Furthermore, 39.3% of FRSC officials believe that public enlightenment programs take the lead in measures put in place to reduce accidents.

- vi. To ascertain the effectiveness of accident reduction measures, 70% of FRSC workers believe in its effectiveness. Also, 61.4% of drivers believe that FRSC perform all activities established for accident reduction.
- vii. Also, 43.3% of FRSC officials claimed daily involvement in night patrols.
- viii. FRSC officials (38.5%) desire salary increase and special allowances as a better working condition.
- ix. Similarly, 54.9% of FRSC workers testified that the level of compliance to traffic rules and regulations is fair.
- x. A good number of drivers (66.3%) acknowledged that disobedience to traffic rules and regulations are a major cause of road traffic accidents.
- xi. FRSC face challenges in accident reduction because they are few in number, they don't have the necessary facilities, they are more interested in generating revenue and they don't work at odd times(periods prone to accident occurrences).

5.2 Recommendations

Road traffic accident constitute a serious problem in Kaduna state as well as in Nigeria and if radical approaches are not taken urgently to address this, it will continue to claim lives, cause injuries and damage to properties. From the findings of this study, the Federal Road Safety Commission (FRSC) has the leading role in reducing road traffic accidents in Nigeria. Depending on the prevailing circumstances and the recognized limitation of FRSC, remedial measures categorized into four are hereby recommended.

Enforcement Equipments and Manpower

From the results obtained from the four major FRSC units in Kaduna state, it was observed that majority of the staffs do not have a vast knowledge of internationally accepted and standardized enforcement equipments for accident reduction which in turn has its effect on required equipments for accident reduction. It is therefore recommended that their knowledge about such equipments be broadened by giving them international training and exposure on equipments that are of international standards needed to reduce road traffic accidents. Also, there is need to employ more skilled labour into FRSC because from the findings of this research, the higher the number of workers, the lower the number of accident cases.

Adequate provision of standardized enforcement equipments should be made for all FRSC units in Kaduna state. This can be achieved by a collective effort of the government and private bodies and this will no doubt boost their efforts in reducing road traffic accidents. Availability of these equipments will definitely motivate FRSC officials to enforce law and order on the roads, ensure compliance to traffic rules and regulations, ensure prompt search and rescue operations, apprehend defaulting road users and have a proper knowledge of the state of roads in relation to accidents.

Periodic overhaul and maintenance of available enforcement equipments should be done. This can be achieved by involving experts in this field to help prevent a complete breakdown and deterioration of these equipments. It will also help to ensure prompt and easy attendance to road traffic accident related issues. This is a major way to ensure the effectiveness of the equipments in reducing accidents.

Adequate and skilled staff should be recruited into the Federal Road Safety Commission. This can be done by systematically recruiting qualified personnel into different sections of the commission to match various job descriptions so as to ensure effectiveness and team work in reducing accidents.

Special attention should be given to the provision of equipments/ facilities needed for night patrols and patrols during wet seasons by ensuring that standard equipments that are in working condition are acquired periodically.

Compliance to Traffic Rules and Regulations

There is need to intensify efforts to enlighten all road users on causes of road traffic accidents and its remedies. This should be done periodically with the use of public address systems, pamphlets, and the media and in schools so that the knowledge will be widely spread in the community.

Traffic rules and regulations and the consequence of non- compliance should be reiterated to all road users periodically to ensure proper and widespread knowledge of these rules. This can also be done through the media, the internet, books or pamphlets.

Staff Welfare

For any organization to achieve set targets and effective results, staff welfare is a major component and resource. It is therefore worthy of note that FRSC officials should be well rewarded for every extra effort being made in reducing accidents.

Present policies relating to their welfare should be reviewed and implemented to suit their skills, operations and efforts made in reducing accidents. This can be achieved by giving special packages/allowances to members of staff who work at odd times especially at night.

Accident Reduction Measures

Periodic consultations should be made to all stakeholders (professionals in the transport industry, government, non-governmental organizations, road users, all road traffic management agencies and the general public) on better measures to be taken in reducing road traffic accidents in Kaduna state.

Data management by FRSC should be improved upon by properly training its members of staff on accident data management that is up to date and universally accepted. This will help them to have a full knowledge of their effectiveness in reducing accidents and what areas should be improved upon and this can only happen if the figures are accurate.

Road safety curriculum in school has been one of FRSC's long term strategies in helping to reduce road accidents with the view to imbibe the culture of proper road usage even at a tender age. There is however a need to intensify efforts to ensure that this practice is enforced in all schools in Kaduna state. Also drivers should be given short term trainings on proper road usage.

There are other agencies saddled with the responsibility of vehicle inspection for several reasons, FRSC should intensify efforts to collaborate with such agencies to thoroughly inspect vehicles for the sole purpose of accident reduction.

The essence of requiring that more FRSC officials should be recruited is to have enough hands on deck for proper operations. Therefore, a 24hour patrol operations should be ensured on daily basis.

5.3 CONCLUSION

The overall goal of the Decade of Action for Road Safety, 2011 - 2020 is to stabilize and then reduce the forecast level of road traffic fatalities around the World by 2020 (WHO, 2011). Also, one of the facts discovered from FRSC's 'safe road in Nigeria', an initiative to reduce road traffic accidents, is that accidents kill more than HIV/ AIDS. Having this fact at hand is a major eye opener to the level of damage and loss it has caused to the nation's economy. Even though FRSC's efforts are noticed nationwide and are seen to be effective in accident reduction, it has been discovered through this study that accidents occur mostly at nights and during rainy season, enforcement equipments are inadequate, FRSC desire better working conditions and staff welfare and accident reduction methods need to be improved upon. It is therefore pertinent to intensify efforts on improving these findings to ensure an accident free environment with uttermost urgency. This research work will sensitize the general public on the roles of FRSC in accident reduction and also the roles of every stakeholder in alleviating the eventualities of accident occurrences.

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APPENDIX I
DEPARTMENT OF GEOGRAPHY,
FACULTY OF SCIENCE,
AHMADU BELLO UNIVERSITY, ZARIA

Dear respondent,

The purpose of this questionnaire is to compare the performance of Federal Road Safety Commission to the rate of road traffic accidents in Kaduna State. All information requested is for research purposes and will be handled as such and in confidentiality.

SECTION A: SOCIODEMOGRAPHY

1. Age group

- (a) 21- 24yrs [] (d) 35- 39yrs [] (h) 55- 59yrs []
(b) 25- 29yrs [] (e) 40- 44yrs [] (i) 60yrs and above []
(c) 30-34yrs [] (f) 45- 49yrs []
(f) 45- 49yrs [] (g) 50- 54yrs []

2. Sex

- (a) Male [] (b) female []

3. Marital status

- (a) Single [] (b) Married [] (c) Others (specify).....

4. Religion

- (a) Islam [] (b) Christianity [] (c) Traditional worship [] (d) Others (specify).....

5. Educational status

- (a) Secondary [] (b) OND [] (c) HND [] (d) University [] (e) Others (specify).....

6. Number of years of working in FRSC

- (a) Less than 2yrs [] (e) 11yrs- 13yrs []
(b) 2yrs- 4yrs [] (f) 14yrs- 16yrs []
(c) 5yrs- 7yrs [] (g) 17yrs- 19yrs []
(d) 8yrs- 10yrs [] (h) 20yrs and above []

SECTION B: KNOWLEDGE AND ATTITUDE

7. When did you commence work in this unit? (Yr).....
8. Which time of the day is accident common in this unit?
(a) Morning [] (b) Afternoon [] (c) Evening [] (d) Night [] (e) Others (specify).....
9. Which period of the year/season are accidents common in this unit?
(a) Wet season [] (b) Dry season [] (c) Hot season [] (d) undecided []
10. What is the level of compliance of road users to traffic rules and regulations in your unit?
(a) Excellent [] (b) Fair [] (c) Poor []
11. As a road traffic enforcement agent, how can you rate your performance in relation to accident reduction?
(a) Excellent [] (b) Good [] (c) Fair [] (d) Poor []
12. In 2013, which time of the day is accident common in this unit?
(a) Morning [] (b) Afternoon [] (c) Evening [] (d) Night [] (e) Others (specify).....

SECTION C: ENFORCEMENT FACILITIES / ACCIDENT REDUCING FACILITIES

13. What is the level of provision of enforcement facilities in your unit?
(a) Adequate [] (b) fair [] (c) poor []

14. What are the available enforcement facilities in your unit? (please, tick as appropriate)

	No required	No available
(a) Patrol vans	<input type="checkbox"/>	<input type="checkbox"/>
(b) Road side clinics	<input type="checkbox"/>	<input type="checkbox"/>
(c) Ambulance	<input type="checkbox"/>	<input type="checkbox"/>
(d) Breathalyzers	<input type="checkbox"/>	<input type="checkbox"/>
(e) Computer system and laptops	<input type="checkbox"/>	<input type="checkbox"/>
(f) First aid kits	<input type="checkbox"/>	<input type="checkbox"/>
(g) CUG(phones)	<input type="checkbox"/>	<input type="checkbox"/>
(h) Towing vans(cranes)	<input type="checkbox"/>	<input type="checkbox"/>
(i) Speed trailers	<input type="checkbox"/>	<input type="checkbox"/>
(j) Radar guns	<input type="checkbox"/>	<input type="checkbox"/>
(k) Patrol bikes	<input type="checkbox"/>	<input type="checkbox"/>
(l) Traffic camera	<input type="checkbox"/>	<input type="checkbox"/>
(m) Public address system	<input type="checkbox"/>	<input type="checkbox"/>
(n) Walkie- talkie	<input type="checkbox"/>	<input type="checkbox"/>

15. What is the condition/state of available facilities?

- (a) Very good (b) Good (c) Fair (d) Poor

16. How can you rate the effectiveness of these available facilities?

- (a) Highly effective (b) Fairly effective (c) Not effective

17. Who, in your own opinion should provide and maintain these enforcement facilities?

- (a) Government (b) Community (c) Private organizations (d) Others (specify).....

SECTION D: WORKING CONDITIONS

18. How often do you involve in night patrol and monitoring of traffic in your unit?

- (a) Daily (b) Weekly (c) Bi- weekly (d) Monthly (e) Others(specify).....

19. What are the facilities required for night patrol in your unit?

- (a) Patrol lights (d) Patrol vehicles
(b) Staff security facilities (e) Ambulances
(c) Reflective jackets (f) Others (specify).....

20. Do you have any special allowances/ packages for working at specific times and places?

- (a) Yes (b) No

21. Do you have any welfare package you are entitled to as a road traffic enforcement agent?

- (a) Yes (b) No

22. If yes, what are these welfare packages?.....

23. What better working conditions do you desire as an enforcement agent?

- (a) Salary increase (b) Staff bus (c) Health care (d) Special allowance
(e) Security (f) Others(specify).....

SECTION E: PRACTICES

24. Are you satisfied with the existing operational practices in your unit?

- (a) Yes (b) No

25. What strategies/ measures do you have in place for accident reduction in your unit?

- (a) Public Enlightenment Programmes (g) Data management
(b) Workshop and training of road users (h) Drivers' training
(c) Search and Rescue services (i) Vehicle inspection
(d) 24hr patrol and monitoring services
(e) Apprehension and fining of road traffic offenders
(f) Road safety curriculum in schools

26. How effective do you see these strategies?

- (a) Highly effective (b) Fairly effective (c) Not effective

27. Are these strategies actually adequate in reducing road traffic accidents?

- (a) Yes (b) No

28. Do you think the quality of these practices is good enough to reduce accidents?

- (a) Yes (No)

APPENDIX II
DEPARTMENT OF GEOGRAPHY,
FACULTY OF SCIENCE,
AHMADU BELLO UNIVERSITY, ZARIA

Dear respondent,

The purpose of this questionnaire is aimed at comparing the performance of Federal Road Safety Commission to the rate of road traffic accidents in Kaduna State. All information requested is for research purposes and will be handled as such and in confidentiality.

SECTION A: SOCIODEMOGRAPHY

1. Age of respondent.....
2. Sex
(a) Male [] (b) female []
3. Marital status
(a) Single [] (b) Married [] (c) Others(specify).....
4. Tribe
(a) Hausa [] (b) Fulani [] (c) Ibo [] (d) Yoruba [] (e) Others (specify).....
5. Religion
(a) Islam [] (b) Christianity [] (c) Traditional [] (d) Others (specify).....
6. Educational status
(a) No educational background [] (b) Qur'anic [] (c) primary [] (d) Secondary []
(e)Tertiary [] (f) Others (specify).....
7. Years of experience as a driver

SECTION B: KNOWLEDGE AND ATTITUDE

8. FRSC officers are effective in reducing accidents
(a) Strongly agree [] (b) Agree [] (c) Undecided [] (d) Disagree [] (e) Strongly disagree []
9. FRSC officers have actually helped to maintain traffic discipline on the roads.
(a) Strongly agree [] (b) Agree [] (c) undecided [] (d) Disagree []
(e) Strongly disagree []
10. What do you see as the shortcomings of these FRSC officers?

- (a) They collect bribes (d) They are too strict in their judgments
- (b) They confuse drivers (e) They delay drivers
- (c) They cause accidents (f) Others (specify).....

11. Have you ever been apprehended by a Road Safety official?

- (a) Yes (b) No (c) No response

12. As a driver that ply these roads daily, you know little of traffic rules and regulations

- (a) Strongly agree (b) Agree (c) Undecided (d) Disagree (e) Strongly disagree

13. Disobedience of road traffic rules and regulations are a major cause of accidents.

- (a) Strongly agree (b) agree (c) undecided (d) disagree (e) Strongly disagree

14. How often do accidents occur on a daily basis on the road(s) you ply?

- (a) 0- 5 times (b) 6- 10 times (c) 11- 15 times (d) 16- 20 times (e) Others(specify).....

SECTION C: PRACTICES

13. What do you regularly see FRSC officials do on patrol?

- (a) They control traffic when there's a serious traffic hold up
- (b) They arrest over speeding drivers
- (c) They arrest drivers that don't use seatbelts
- (d) They inspect vehicles
- (e) They check drivers' license
- (f) They arrest drivers with over loaded vehicles
- (g) Others (specify).....

14. With these activities while on patrol, FRSC officers have been able to help reduce the rate of accidents.

- (a) Strongly agree (b) Agree (c) Undecided (d) Disagree (e) Strongly disagree

15. FRSC staff have not been effective in their role in accident reduction because

- (a) Their number are too few
- (b) They don't have the necessary facilities
- (c) They are more interested in generating revenue through defaulting drivers
- (d) They don't work at odd times
- (e) Others (specify).....

16. What suggestions can you give to help FRSC's roles in reducing accidents?

- (a) FRSC officials should be provided with adequate facilities []
- (b) Bad roads should be repaired []
- (c) The number of FRSC staff should be increased []
- (d) Frequent enlightenment programs should be done []
- (e) Others (specify).....