

**ANALYSIS OF ROAD TRAFFIC CRASH ALONG LOKOJA – ABUJA
HIGHWAY, NIGERIA**

BY

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DECLARATION

I, Maina Williams Esther sincerely declare that this dissertation titled “Analysis of Road Traffic Crash along Abuja-Lokoja Highway, Nigeria” was written by me in the Department of Geography under the supervision of Dr A.E. Ubogu and Dr I.J. Musa. I wish to further attest that no part of this thesis had been presented elsewhere for any other degree. It is instructive to also declare that all sources of information used in this research were duly acknowledged.

Maina Williams Esther

Date

CERTIFICATION

The dissertation titled “Analysis of Road Traffic Crash along Abuja-Lokoja Highway, Nigera” by Maina Williams Esther meets the regulations governing the award of Masters of Science in Geography of Ahmadu Bello University, is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This dissertation is dedicated to God Almighty and my beloved parent.

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ABSTRACT

The phenomenon of road traffic crash along Abuja-Lokoja highway has been a source of concern in view of the loss of life and its socio-economic consequence. This study examined the causes of road traffic accidents along Abuja-Lokoja highway using a survey questionnaire and secondary data obtained from the Federal road safety corps (FRSC) Kogi State and Federal Capital Territory (FCT) sector commands covering the period 2003 to 2012. A total of 120 copies questionnaires were administered to commercial drivers in seven (7) motor parks. However, only 98 copies were successfully retrieved and considered appropriate for the analysis. The data generated were analysed using descriptive statistic and trend analysis. The result of the analysis shows that human related factors are mainly responsible for majority of the accident in the study area. Similarly, cars and buses are vehicle types that are frequently involved in accident on the road. Also majority of the accidents on the road occur during the daytime especially from 6am to 6pm. To address these problems, FRSC and other government organisations involved in road management should improve their effort at sensitizing the public especially the drivers on the need for safety behaviour while driving. Also regular monitoring patrol by Federal Road Safety Corps (FRSC) and Vehicle Inspection Officers (VIO) with the objective of checking the excesses of drivers along the route should be a daily exercise.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Transportation has liberated man and makes him more mobile, his increasing reliance on vehicular movement has conferred great facilities on him and his activities. The greatest culprit of all the modes of transport is road of which traffic crash is the most disturbing repercussion of its use (Sumaila, 2013). Globally, the phenomenon of Road Traffic Crash (RTC) is one of the leading causes of death. Annually, at least 1.2 million people die and 50 million are injured in RTC, a scale of death comparable to malaria and tuberculosis (World Health Organisation (WHO) 2005). More than 85% of these casualties occur in the low and middle income countries. Road traffic crash imposes a huge burden on developing countries amounting to 1-2% of GNP in most countries. This estimate takes account of only the direct economic cost mainly lost to productivity, rather than the full social costs often recognized by industrialized countries, its effect among the poor can be unequal. In low and middle income countries, poor people like pedestrian, cyclists and motorcyclists are usually vulnerable to RTC. They are of particular risks from the greater variety and intensity of traffic mix and the lack of separation from other road users. In Kenya, pedestrians and passengers in mass transit accounted for 80% of all fatalities and in Mumbai (India), 78% of road fatalities were pedestrians (WHO, 2005).

Road traffic crash is therefore an issue of great international concern as it has emerged as the single greatest source of death all over the world. In the developing countries where the number of motor vehicles relating to population is generally much lower than in the developed countries, fatalities from automobile crashes are higher.

In Nigeria, Road Traffic Crash (RTC) at first seems relatively unimportant when compared with other problems that cause death like poverty, drugs, disease and hunger. A careful analysis and studies on the causes of death in a number of countries throughout the developing world has shown that death and fatalities from RTC in Nigeria rank among the highest in the world and second behind those by hunger and gastroenteritis (Balogun, 2006).

Other studies by Federal Road Safety Corp (FRSC, 2005), have shown that Lagos, Kano, Ogun, Oyo, Kaduna, Niger, Edo and Delta States have individual fatality average exceeding the national average of 11 per 100,000 populations. It was also found out that a person is likely to be killed every 47 minutes and an accident occurred every 10 minutes in Lagos State between 1990 and 2004. All these and other available data, show that RTC has become a serious national malaise and the cost is colossal.

The RTC presented in the preceding paragraph may be as a result of sudden increase in movement of people by road, without a commensurate increase in the development of road infrastructures like; traffic management tools, good roads and road complementary facilities. Amongst the contributing factors to road accidents are human factors, vehicle condition and road environment. Human factors (the driver) contribute approximately 90% according to Balogun, 2006.

The problem of RTC in Nigeria cannot be fully appreciated by looking at Nigeria's trend alone, yet international comparison can be misleading if not treated with caution. This is because the difference could arise from such factors as difference in traffic composition, in the proportion of vehicle travels which occurs in areas of urban development, in the definition of mobility and mortality statistics, in the quality of roads, street lighting, vehicle legislation and standard of driving.

For instance, if one compares the number of accidents per year, month, day, and hour, it seems that safety decreases as one progress from Uganda to Nigeria to Britain. But the reality is that Britain has more vehicles on its road. Figures from the total killed appear to show that those killed in Nigeria is half that of Britain. But when the number killed is compared to the total fatal crashes the Nigerian roads appear deadlier (Balogun 2006).

Hence, one has to still rely on the number of death, which is mandatorily reported to the Police. Comparing the percentage of fatal, serious and minor accidents in Nigeria and Britain shows that Nigerians are likely to die more. Comparing the ratio of fatal, serious and minor shows that minor crashes are twice prevalent as fatal crashes. Perhaps another more instructive perspective is comparing percentage change over a period among the countries. While countries like Britain and Sweden recorded negative or decrease, developing countries like Nigeria recorded an increase.

1.2 STATEMENT OF THE RESEARCH PROBLEM

Road Traffic Crash (RTC) by its nature is unplanned and unexpected. It happens when a road vehicle collides with another vehicle, pedestrian, animal or geographical or architectural features. Road traffic accident according to Jha, Srinivasa, Roy and Jagdish (2004) is deemed to have occurred on the road when it involves two or more objects, one of which must be any kind of a moving vehicle. According to AUSTROADS (1994), road accidents occur as a result of one, or more than one of the following factors: human factors; vehicle factors; road and environmental factors. (Aaron and Strasser, 1990; Balogun and Abereoje, 1992).

The RTCs can result in injury, property damage and death. RTC results in the deaths of 1.2 million people worldwide each year and injures about 4 times this number (WHO, 2004). Road Traffic Crashes are increasing with rapid pace and presently these are one of the leading causes of death in developing countries particularly in Nigeria. The morbidity and mortality burden in developing countries is rising due to a combination of factors, including rapid motorization, poor road and traffic infrastructure as well as the behaviour of road users (Nantulya and Reich, 2002). This contrasts with technologically advanced countries where the indices are reducing (Oskam, Kingma and Klasen 1994; O'Neill and Mohan, 2002).

Nigeria is a motorized country with poor road conditions and transport systems has potential for high rate of Road Traffic Crashes (RTCs) and the tendency for it to continue to increase is there. The recognition of RTC as a crisis in Nigeria inspired the establishment of the Federal Road Safety Corp (FRSC). The FRSC was established by the government of the Federal Republic of Nigeria vide Decree 45 of 1988 as amended by Decree 35 of 1992, with effect from 18th February, 1988. The Commission was charged with responsibilities for organization and administration of road safety in Nigeria.

Over the years, the Legislative and other measures such as the establishment of FRSC and the Vehicle Inspection Office (VIO) among others in mitigating the menace of RTC have not recorded spectacular achievement (Asogwa and Obionu, 2000). Records still show that RTC occurrence and fatalities in Nigeria is still alarming.

With regard to previous studies on road traffic crash in Nigeria, Dogo (2011) used data on reported cases of RTC obtained from FRSC to analyze the level, causes and severity of RTC in Kaduna Metropolis between 2000-2009, the result shows a

consistent rise in terms of fatalities and certain areas are known as flash-points. In a related study; Bako and Musa (2011) in their study of RTC occurrence on selected roads in urban Zaria used a combination of questionnaire survey, hospital and FRSC record to determine the rate of RTC occurrence per day, month and year in urban Zaria, the result attributed major causes of RTC to drivers recklessness, refusal to obey traffic rules and low education level.

Dawan and Obieikhalu (2011) study on the analysis of the major causes and costs of RTC in FCT agreed with the work of Bako and Musa (2011) on urban Zaria, as the study identified more drivers' related causes of RTC which include; dangerous driving, speed violation, overtaking, traffic violation and road hazards violation. Furthermore, the work of Ayeni,Doherty,Soneye and Muyiwa (2011) relates RTC to climatic seasons in Lagos state between 2005-2010, using accident and climatic data obtained from NPF, FRSC and NIMET, through a technique of correlation analysis, (Aisha,Usman and Akhadelor,2011), used a combination of primary and secondary data analyzed using SPSS statistical software and Duncan Multiple range test to show that there is significant difference in the frequency of RTC among the months of the year and that drivers' recklessness was found to be the major cause of RTC compared to the types of vehicles found along Samaru-Sabongari (Zaria) roads.

A common shortfall of these studies is that they are largely limited to single urban setting, rather than a road corridor cutting across different political and administrative jurisdiction or limited in terms of the scope of analysis (environmental, human and social predictors of RTC), which makes a holistic appraisal and recommendations at mitigating the occurrence of RTC less effective. Furthermore, the fact that road traffic crashes and mortality rates are still high despite various remedial measures taken in previous years to combat the problem, clearly suggests one thing that

we are yet to get it right which demands further investigation. The challenges in road accident reduction demand an accurate, appropriate and case specific analysis of relevant information on how, when, where it happens along a particular corridor and the dissemination of information to all the parties involved in accident prevention. Linking geographic location to information is vital to rational decision-making; this remains a research gap which this study intends to fill.

There is a need for regular evaluation of the RTC in terms of the trend, major causes, vehicles involved and types. This will facilitate the development of measures aimed at reducing the rate of RTC. The Abuja/Lokoja highway is approximately a 186kilometer (Federal Capital Development Authority, 2006) road that links the entire southwest, east and southern states of the Federation to FCT through Lokoja, the capital of Kogi State. Considering the importance of the road and the increased level of RTCs in recent years along the road, there is need for this study aimed at characterizing the RTC to provide an enabling base for the development of countermeasures by the Government and the road safety agencies to reduce the incidences of RTC.

Based on the forgoing, the study provides answer to the following research questions:

- i. What spatio-temporal characteristics do RTCs exhibit along Abuja-Lokoja highway over the period of study?
- ii. Are the RTCs along Abuja-Lokoja highway localized around a certain segment of the network?
- iii. What are the attributes of the road around the location of accidents?
- iv. What is the nature of RTC causalities (minor, serious and fatal) along Abuja-Lokoja highway? and

- v. What type(s) of vehicle are usually associated with RTC along the highway?

1.3 AIM AND OBJECTIVES OF THE STUDY

The aim of the study is to analyze the characteristics of Road Traffic Crashes along Abuja - Lokoja highway between 2003- 2012. Specifically, the study seeks to achieve the following objectives:

- i. To determine the rate of occurrence of RTCs along Abuja-Lokoja road between 2003- 2012 time period;
- ii. To examine the pattern of RTC along the two segments of Abuja-Lokoja highway
- iii. To analyze the characteristics of road traffic accident along Abuja- Lokoja highway between 2003- 2012;
- iv. To analyze the fatalities of RTC along the route between the 2003- 2013 time period; and
- v. Identify the vehicle types involved in RTC along Abuja-Lokoja highway.

1.4 SIGNIFICANCE OF THE STUDY

The focus of the study among other things lies in revealing the attributes of road traffics crash along Abuja-Lokoja highway between 2003-2012 with regards to their number, location, characteristics and the vehicle types mostly associated with RTC upon which reduction measure can be focused upon. Therefore, this study is of significance to the agencies responsible for road safety issues in Nigeria, these include: Federal Road Safety Corp, (FRSC), Vehicle Inspection Office (VIO), Police, Directorate of Road Traffic Service (DRTS). This is because these safety intervention

agencies will be better informed or advised on which areas, when and how to collectively synergize their effort in tackling the menace of road traffic crashes.

On the part of the owners, operators and users of transport services, the outcome of this study will help them in making safety decisions on what vehicle types are safer, which time of the year is RTC more prevalent and what segment of the road highway should they exercise caution so as to avoid RTC. To the road maintenance agencies like Federal Road Maintenance agency (FERMA), the findings of this study will assist in their intervention activities on areas which need urgent maintenance or rehabilitation attention. Generally, this study will contribute to enriching academic knowledge and fill research gaps in road transport and safety disciplines and could serve as a base for identifying areas that require further research on RTC along the Abuja-Lokoja corridor in the immediate and remote future.

1.5: SCOPE OF THE STUDY

The study covers a period of ten (10) years (2003- 2012), based on this time frame, the data is considered as adequate for a reasonable historical analysis, especially as they are generated on a monthly, quarterly and annual basis along the different segments of the road, covering different weather, environmental and land use conditions for the purpose of observing how they affect RTC in the study area.. The accident records generated and documented by the Vehicle Inspection Office (VIO) of Kogi State, Directorate of Road Traffic Services (DRTS) of the Federal Capital Territory (FCT), FRSC Kogi State and FCT FRSC Sector Commands were used. The records of RTC (Fatal, Serious and Minor as reported) covering all categories of vehicle makes and models, using the road during the period under study were obtained and used for analysis. The range of vehicles types and model was premised on the availability of

reliable, accurate data and in the manner in which they were recorded over the years by the agencies mentioned above.

The specific focus of the study was about 186kilometers (Federal Capital Development Authority, 2006) stretch Abuja-Lokoja highway, beginning from Zuba to Lokoja. This stretch cut across many villages and towns in Federal Capital Territory and Kogi state, this include: Zuba,, Abaji, and Lokoja to mention just a few. These settlements falls under different political, jurisdictional and administrative settings in the present day Kogi State as well as the Federal Capital Territory.

This study therefore through the instrument of review of documentary records, questionnaire administration and physical inspection focused on characterizing the vehicle types involved in RTC, the rate of occurrence and characteristics of RTC along the Abuja-Lokoja highway.

CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1 INTRODUCTION

The chapter examined relevant theories put forward to explain road traffic accidents causation. The chapter also examined some relevant literature on the phenomena of road traffic accidents in Nigeria and pattern of road traffic accident fatalities. Lastly, the chapter reviewed literature relating to causes and effects of road traffic accident.

2.2. Conceptual Framework

A handful of theories have explained Road Traffic Accidents causations. Some of the best known theories used are System theory and Risk theory.

2.2.1 System Theory

The systems perspective views human performance as a function of many interacting system-wide factors. In the context of human error and accident causation, for example, it is now accepted that errors are a consequence of ‘systems’ failure rather than merely aberrant psychological factors within individuals. Human error is thus no longer always seen as the primary cause of accidents; rather, it is treated as a consequence of latent failures residing within the wider system (Reason, 2000). In the road safety context, elements of the system beyond road users, such as vehicle design and condition, road design and condition, road policies, and so on, all shape drivers behaviour on the road.

The systems-based models has now become the most prominent and widely accepted in explaining the causes of accident (Aderamo 2013). Systems-based accident analysis and investigation, described also in the 'Swiss model', Reason, (2000) has been applied with significant success in a range of safety critical domains such as in road transport, aviation, process control, rail transport and in a range of other domains which they have been applied successfully.

2.2.2 Risk Theory

Risk theory has also been used in the description of accident causation. Risk can be defined as the effect of uncertainty on object whether positive or negative. Its management is followed by coordinated economical application of resources to minimize, monitor, and control the probability and impact of unfortunate events (Rund mo,2004;Moen,2005;Hubbard,2009) or to maximize the realization of opportunities. Risks can come from uncertainty in financial markets, project failure, legal liabilities, credit risk, accidents, natural causes and disasters as well as deliberate attacks from an adversary. Road traffic accidents risk, according to Dejoy (1989), it is a function of four elements. The first is the exposure or amount of movement or travel within the system by different users or a given population density. The second is the underlying probability of crash, given a particular exposure. The third is the probability of injury given a crash. The fourth element is the outcome of injury. Risk can also be explained by human error (Rasmussen, 1999; Reason, 2000) kinetic energy, tolerance of human body and post-crash care (Bustide et al, 1989).

Lupton (1999) also asserts that risks can be seen from four perspectives. These are the rationalists, realists, constructionists and middle positions. The rationalists see risks as real world phenomena to be measured and estimated by statistics, prioritized by

normative decision theory and controlled by scientific management. The realists' sees risks as objective hazards or threats that exist and can be estimated independently of social and cultural processes but that may be distorted or biased through social and cultural frameworks of interpretation. The constructionists see nothing as a risk in itself, rather, what is understood to be a risk. The constructionists see it as the product of historically, socially and politically contingent ways of seeing. Proponents of the middle positions between realist and constructionists theories sees risk as an objective hazard or threats that is inevitably mediated through social and cultural processes and can never be known in isolating from these processes (Jaeger *et al.*, 2001; Horden, 2004).

2.2.3 Geographical Approach to Traffic Crashes

The geographical approach to the study of traffic accidents relates the concept of place, time and environment to accident occurrence. It is believed that land uses, road element, width of the road, bending of road, hilly area, topography and regional distribution in occurrence of road traffic crash are factors to be considered. According to Cutter (1993), geographical scale is important for impacts and their reduction of land use pattern, types of road network, local business and activity pattern will influence the system risk in an area (Komba, 2006). There are also rural-urban differences. In urban areas, there are more accidents, lower degree of injury while in rural areas, there are lower accident levels but more serious fatalities.

2.3 LITERATURE REVIEW

These are literature and studies on the phenomenon of road traffic crashes in Nigeria, pattern of road traffic crashes fatalities and causes and effects of road traffic crashes.

2.3.1 Phenomenon of Road Traffic Crash in Nigeria

As in other developing countries, road traffic crashes in Nigeria is one of the most serious problems in need of pragmatic solution. 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 and the second in the world (Akpogomeh, 1998; Obinna, 2007 and Atubi 2012e). Studies have shown that the proportion of deaths from road traffic accidents in Nigeria increased from 38.2 percent to 60.2 percent in the ten years from 1991 to 2001 (Obinna, 2007). Thus, Nigeria's annual 8,000 to 10,000 accident deaths between 1980 and 2003 were a major personal and traffic safety problem as well as a terrible waste of human resources for the country. In terms of the personal safety problem, Nigeria is a high risk region with an average of 32 traffic deaths per 1,000 people (Filani and Gbadamosi, 2007; Atubi, 2012c). This is very high compared with the United States' 1.6 traffic deaths per 1,000 populations and with the United Kingdom's 1.4 deaths per 1,000 people (Trinca et al, 1988). In terms of traffic safety, there are on the average 23 accidents per 1,000 vehicles in Nigeria (i.e. 230 per 10,000 vehicles) far in excess of the accident rates in the USA (2.7 accidents per 10,000 vehicles) and the UK (3.2 accidents per 10,000 vehicles).

According to data from the Nigerian Federal Road Safety Corp, the country has the highest rate of death from motor accidents in Africa; leading 43 other nations in the number of deaths per 10,000 vehicle crashes (FRSC 2006; Obinna, 2007). Nigeria is followed by Ethiopia, Malawi and Ghana with 219,183 and 178 deaths per 10,000 vehicles respectively (Daramola, 2004). The number of reported cases of fatal road traffic accidents in Nigeria has shown an increasing trend from 12,212 cases of accidents in 1995 to 13,913 in 1996 and 15,418 in 2004, indicating an increase of 13.9% in fatal road accidents from 1995 to 1996 (Central Bank of Nigeria, 1997). Fatal road

accident figures across Nigeria rose sharply in 1992 resulting in 22,992 deaths (CBN, 1994). According to the Annual abstract of statistics (2008), between 2003 and 2007, a total of 225,891 accident cases were reported by the Nigeria Police Force, out of which 29,490 were fatal, 39,065 were services cases, 23,380 were minor cases.

2.3.2 Pattern of Road Traffic Crash Fatalities

Road crash fatalities continue to attract the attention of policy makers and the populace all over the world. The incessant carnage on the roads, especially in developing countries, constitutes a major challenge to safety professionals. This is evident from available statistics on road accident crashes and injuries all over the world. However, as a result of safety measures adopted in developed countries, variation exists in the magnitude of this scourge between developed and developing countries. While for example developed countries have experienced a decreasing trend since the 1960s, the fatality rate in African countries ranges from 10-fold to more than 100-fold of those in the United States (Jacobs and Aeronthomas, 2000; Peltzer and Renner, 2004; Chen, 2010). Lagarde (2007) also reported that while South-East Asia has the highest proportion of global road fatalities (one-third of the 1.4 million occurring each year in the world), the road traffic injury mortality rate is highest in Africa (28.3 per 100,000 population) compared with 11.0 in Europe. Indeed, if major efforts are not made to reverse the trend, it is feared that road traffic crash fatality rate in Africa as a whole is anticipated to increase by 80 per cent between 2000 and 2020 (Peden *et al.*, 2004).

In terms of vulnerability, road traffic injuries and fatalities are mostly concentrated on males of their most productive age. According to OECD (2006) and Williams (2003); young drivers have been found to have higher rates of accidents than older drivers. Statistics has also shown that mortality in road traffic accidents is very

high among young adults in their prime and who also constitute the workforce (Balogun and Abereoje, 1992). Besides, pedestrians account for between 45 per cent and 75 per cent of all road traffic deaths in developing countries (Odero et al. 1997). In Africa, pedestrians and passengers of public transportation are the most affected (Lagarde, 2007). These are usually the breadwinners in many families. Over 75 per cent of road traffic casualties in Africa are in the economic productive age bracket between 16 and 25 years.

The causes of traffic crashes and fatalities are also varied. Three major categories have traditionally been identified. These are human, vehicle and highway infrastructure (Haddon, 1980). Amongst the three factors, the human factors including road user behaviour and incapacitation have been found to account for more than 85 per cent (Odero et al., 2003). Among them, the two-best-known contributing factors are speeding, drinking and driving (Afukaar,2003; Chen,2010). Human incapacitation, such as visual acuteness and driver fatigue has also been identified among the human factors (Onabolu, Otulana and Awodein, 2008). The vehicle factor relates to the road-worthiness of vehicles. Vehicle failure resulting from vehicle defects, lack of maintenance and using low quality spare parts also contribute to road crashes and fatalities (Odero, 2003). Highway infrastructure defects such as potholes, sharp bends and generally poor road conditions also have significant effect and contribute to road crashes.

A significant precaution to save lives in the event of road crashes is provision of emergency services. Limitations that explain the poor outcome for people involved in road traffic crashes in Africa have been identified as lack of trained surgeons, intensive care staff, and field Para medics, underserved medical facilities; inappropriate dedicated transportation and disorganized or non-existent emergency and trauma services

(Lagarde, 2007). However, most studies in road traffic crashes and fatalities have concentrated on the trends of such events and not emphasizing the spatial patterns. Yet, road traffic crashes and fatalities should be examined also from spatial dimension. In the same way that variations exist in climate, vegetation and economic resources, so also do variations exist in the incidence of road traffic fatalities at global, regional and local levels (World bank, 1999).

2.3.3 Causes and Effects of Road Traffic Crashes

Causes of motor vehicle crashes are multifactorial and involve the interaction of a number of pre-crash factors that include people, vehicles and the road environment (Atubi, 2013). Human error is estimated to account for between 64 and 95% of all causes of traffic crashes in developing countries (Atubi, 2009b). A high prevalence of old vehicles that often carry many more people than they are designed to carry, lack of safety belts and helmet use, poor road design and maintenance and the traffic mix on roads are other factors that contribute to the high rate of fatalities in less developed countries. In 1976, there were 53,897 road traffic accidents resulting in 7,717 deaths. Although in 1981, the magnitude reduced to 5,114 accidents, but the fatality increased to 10,236 which mean that there was an average of 96 accidents and situation in subsequent years has not been any better. The number of people killed in road accidents between 1990 and 2005 rose from 28,253 and the fatality rate remains consistently high (Atubi, 2009c).

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 197 accidents, France one death in 175, South Africa, one death in 47 accidents, Nigeria

has one death in 2.65 accidents (Atubi, 2010b). Road traffic crashes' statistics in Nigeria reveal a serious and growing problem with absolute fatality rate and casualty figure rising rapidly. In majority of developing countries, accident occurrence and related deaths are relative to either population or number of vehicles. Ironically, in Nigeria, studies have indicate that better facilities in terms of good quality and standardized roads have been accompanied by increasing number of accidents (Onakomaiya, 1988; Gbadamosi, 2002; Atubi and Onokala, 2009). This is totally contrary to the trends in countries where even the level of sophisticated road network and volume of vehicular traffic are much higher (Atubi, 2010a).

Pludemmann *et al.* (2004), posits that drivers use of Alcohol contribute to traffic injuries by impairing driving capabilities and thus increasing the risk of crash involvement. Although alcohol is generally thought to be the most important risk factor among all drugs, some evidence has also linked the use of minor tranquilizers such as benzodiazepines increase risk of crash involvement (Gururaj, 2004). Again, there is evidence that drivers with diabetes, epilepsy, cardiovascular disease or mental illness experience higher crash and violation rates (Mishra *et al.*, 2010) but there is an equal number of studies indicating that neither chronic medical conditions nor disabilities among automobile drivers put them at greater risk of RTAs (Mohan, 2007). According to Cutter (1993), geographical scale is important for impacts and their reduction. Land use pattern, types of road network, local business and activity pattern will influence the system risk in an area (Komba, 2006).

The cost to society such as lost of able bodied men and women who hitherto, would have been involved in productive economic activities, lost of intellectuals in schools, lost of resources to government and families, to insurance companies and damage to properties, etc are inestimable. Again, valuing the psychosocial impact on

victims is another difficult task. Issues like suffering and loss of life injuries associated with road traffic accidents is difficult to assign monetary value. According to Onakonaiya (1992), with injuries, people often suffer physical pain and emotional anguish that is beyond any economic compensation. Permanent disability such as paraplegia, (paralysis of the lower half of the body), Quadriplegia (paralysis of all four limbs), loss of ability to achieve even minor goals and result in dependence on other people for economic support and routine physical care which may although not in all cases for the rest of the victim's life (Jacob, 1990). According to Nnadede (1997), "Equal protection to all road users should be aimed at, since non-motor vehicle users bear the disproportionate share of road injuries and risk. The traffic system should help users to cope with increasingly demanding condition".

Around the world, road traffic injuries pose a major public health challenges that requires concerted efforts to reduce through effective and sustainable method of preventions. An estimated 1.3 million people are killed through road accident annually around the world and as many as 50 million people suffer injuries. The World Health Organization (WHO) believes that this figure will increases to 1.9 million if concrete action is not taking by the end of 2020, especially in developing country such as Nigeria (Road Safety Nigeria, June 2009 and the Nigerian Tribune march 13th, 2009).

Statistics has it that the country with the highest road accident in the world is India with 105,725, followed closely by China with 96,611 and United state of America with 62,272 cases of reported road accident as at 2009 (Inyang, 1986). In Nigeria, the Federal Road Safety Commission (FRSC) is the government agency with statutory responsibilities for road safety administration. Prior to the establishment of FRSC in 1988; there was no concrete and sustainable policy action to address the carnage on Nigerian roads. Earlier attempt in this direction were limited to discrete and isolated

attempt by individuals. Shell Petroleum Development Company (SPDC) tried and they failed in 1960-1965 (www.shellpetroleum.com). The Nigerian Army started the first training of its men on road safety campaign in 1972. It was officially created in 1994 which was then called Nigerian Road Safety Commission (NRSC). The impact of the commission was not however sustained.

Apart from humanitarian aspect of the problem, traffic accidents and injuries, these countries incur annual losses worth \$65 billion to \$100 billion annually. These costs include both loss of income and the burden placed on families to care for their injured relatives. The Americans bear 11% of the burden of road traffic injury mortality (WHO, 2002). The socio-economic costs of RTA in Nigeria are immense and the direct cost of traffic casualties can perhaps, at best be understood in terms of the labour lost to the nation's economy (Adekunle, 2010). It has been estimated that persons injured in accidents on Nigerian highways and streets no longer participate in the economic mainstream and this amounts to a loss of labour of millions of person's years to the nation (Pratte, 1998).

CHAPTER THREE:

STUDY AREA AND RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presents the physical environment of the study area and also discussed the methods used in generating the primary and secondary data used for the study.

3.2 THE STUDY AREA

The Abuja-Lokoja highway is located in the heart of Nigeria at the southern part of the Federal Capital Territory and the northern part of Kogi State. The road covers a total length of about 186 kilometer (Federal Capital Development Authority, 2006) stretch Abuja-Lokoja highway, beginning from Zuba to Lokoja. This stretch cut across many villages and towns in Federal Capital Territory and Kogi state, this include: Zuba, Gwagwalada, Kwali, Yangoji, Gada-Biu, Abaji, Kotonkarfe, Gegu-beki and Lokoja among others. (Fig 3.1) The road links the entire southwest, east and southern states of Nigeria to FCT through Lokoja the capital of Kogi state. The route is a single lane highway (dualization presently ongoing) and one of the most critical roads in the country being the major link between the north and the south for the movement of people and goods through road transport. The road is also very significant to the survival of the nation because it boosts economic activities in the country and therefore one of the busiest roads in Nigeria today. The road is currently undergoing dualization which is about 70% completed as at December (2014)

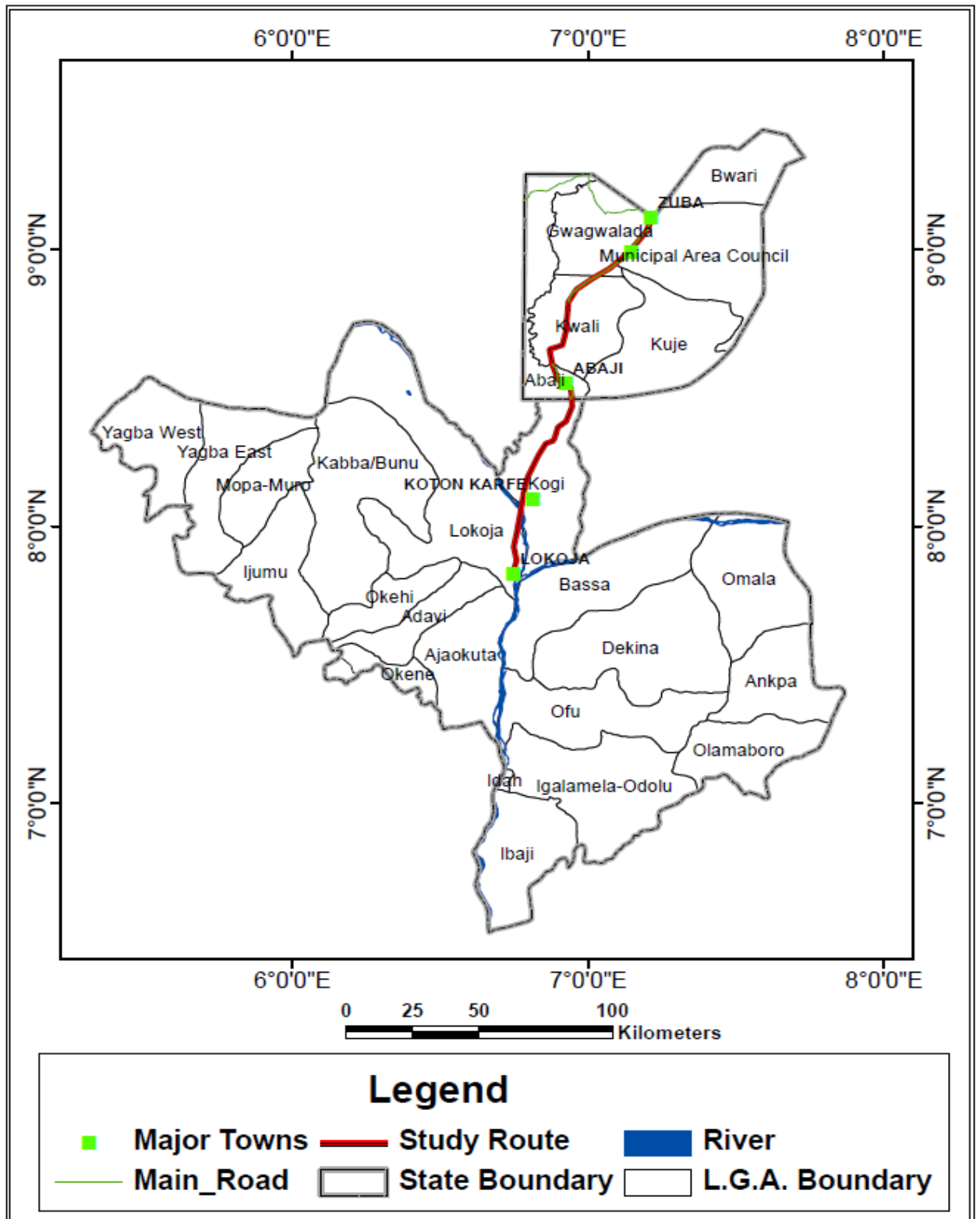


FIG.3.1: FCT and Kogi State showing Abuja-Lokoja Highway (Study Route).

Source: Derived from the Administrative Map of Nigeria.

3.2.1 Climate

The climate of Abuja – Lokoja highway falls under the tropical sub-humid climate with distinct dry and wet season with high temperature throughout the year. The climate is classified as the Aw according to Koppen's classification scheme. The sunshine duration ranges from 8 to 9 hours daily, but increases in cloud cover during the months of July, August and September drops, then the sunshine hours per day reduces to the average of about four hours (Adakayi, 2002).

The climate is influenced by two distinct winds (south-easterlies and North-westerly). These winds influences the seasonal variation in the road corridor, they are the Tropical Continental Air Mass (North-Westerly) and Maritime air Mass (South-easterlies) that determines the seasonal variation in West Africa. The effect of Maritime Air Mass is felt along the corridor somewhat between late February or early March to mid-October or early November when this air mass blows across West Africa hence, rainy season. While the effect of Tropical Continental Air Mass is felt is felt in the area between mid-October or early November to late February or early March.

Relative Humidity (RH) rises along the road corridor during the rainy season and falls considerably during the dry season. In the afternoon, RH rises to above 60% during rainy season and falls to as low as 30% during the dry season (Hassan, 2002). The month of January has been shown to record the lowest RH of between 34.2% to 52% and the highest in the month of August ranging from 82.9% to 95% in 10 years analysis of RH of Gwagwalada (Madaki, 2005).

3.2.2 Geology

There are two broad geological regions across the stretch of the road, each with broadly similar structure and lithological characteristics. The first comprises the Basement Complex rock and this account for 80% of the total area. The second consists of sedimentary rock in the South and South-West, forming part of the Nupe sand stone (Mabogunje, 1977). Alluvial deposits are also found but do not constitute a major soil parent material in the area. Precambrian magmatic, gneisses, granite and schist of the crystalline basement complex almost predominately underline FCT and its surrounding environment.

3.2.3 Vegetation

The prominent vegetation type recognized within the Abuja-Lokoja highway is park savannah, which is characterised by a continuous shrub, grasses and canopy. Common trees recognizable in Abuja-Lokoja highway and its environment are shea butter, locust beans trees and the *isoberlina* trees to mention just a few. Though, most of the vegetation has been depleted to give way for physical development and agricultural production except on a hilly and rugged terrain where cultivation is not possible, the vegetation is used for pasture and wood harvesting.

3.2.4 Human features

The early studies on the ethnic grouping in the Federal Capital Territory (FCT) and its surrounding environment in which Abuja-Lokoja expressway is part of were contained in the contributions of the scholars on the origin of people like Mabogunje,

(1976) and Abumere (1981), who traced the indigenes of the FCT to the Beriberi or Kanuri stock from Borno State.

Historical facts and several archaeological evidences indication have shown that FCT indigenes like Basa, Gade, Ganagana, Gwari and Ebira Koto that are basically settlers along Abuja-Lokaja expressway have deep affiliation with the Kwa people who are known to have settled in the region many centuries before the Jihad of the 19th century. Hausa and Fulani are also found in small settlements and in the various rural areas along the highway. Similarly there are other ethnic groups like Ibo, Yoruba, Igala, Idoma, Tiv, Ijaw and Itsekiri to mention a few, who are however regarded as non indigenes because they are late arrivals and are normally regarded as migrants. The diverse population have made great visible impact on the cultural landscape along the road network..

3.2.5 Economic Activities

The area under study has vast fertile land that support agricultural activities like cultivation of crops and rearing of animals. The inhabitants along Abuja-Lokoja highway are chiefly subsistence farmers. Fishing activities are also prominent among the Bassa people and villages along river Gwagwalada, river Niger and several other rivers. Notable among them are the Bassa people and the Ebira Koto that trade on fish along River Niger Bridge in Kotonkarfe. Beside fishing and farming activities, wood and craft work as well as pottery and iron work are noticeable occupation of people of the Abuja-Lokoja highway. More so, trading is one of the major economic activities among the Ibo and Hausa immigrants with fewer indigenes in trading and marketing of farm produce.

Finally, the transport activity of the region started long ago as a small portion of the corridor system of transportation development by the British colonial government. This later became state owned road and presently a federal road. While the areas outside the corridor were served by several earth roads that usually originate from smaller settlement and hamlet in the interior. These rural arterial roads and rural collector roads are linked to the Abuja-Lokoja highway that provides them with the final services of road delivery.

3.2.6 Physical Condition of the Road

The Abuja-Lokoja Highway was constructed in the late 70s an alternative route to the North from the South. The road is mostly double line and single lane in some part of the route with heavy presence of vehicular traffic (Car, Trucks, and Tanker etc). Although with frantic effort of maintenance the traffic carrying capacity which has been overstretched make the highway perpetually unsafe and in a state of disrepair. In terms of physical alignment, the road is narrow and winding. It is characterized by occasional steep slopes, which make movement difficult for long vehicles to move smoothly. This is against the background that the Dangote Cement Plant located at Obajana close to the route, this company alone turns out about 500 trailers per day to the highway. Presently, the road is being dualized and the work in progress.

3.3 RESEARCH METHODOLOGY

This section presents the types of data required for the research, sources of data, population of the study, the sample and sampling technique adopted and procedures of data collection and analysis.

3.3.1 Reconnaissance survey

The researcher conducted preliminary/ reconnaissance survey along the 186 KM route. The purpose of the reconnaissance survey was to acquaint the researcher with the road corridor and select possible sampling points, which led to the identification of seven survey points along the entire segments. These locations are; Zuba, Gwagwalada, Kwali, Abaji, Gegu-beki, Kotonkerfe and Ganaja Junction motor parks.

3.3.2 Types of Data utilized

Based on the objectives of the study, the data utilized for this research includes the following:

- The number, frequency and characteristics of RTC along the road between 2003- 2012;
- The severity of RTC and or causality figure of RTC that occur on the road,
- The location or segment of the highway in which the RTC occurred;
- The highway attributes; condition, surfacing, width, alignments etc where the RTC occurs; and
- The vehicle types commonly associated with the crashes.

3.3.3 Sources of Data

The data types were obtained through primary and secondary source. The primary data include: questionnaire administration.

The secondary data were abstracted from published and unpublished documents such as the number; location and severity of RTC from FRSC, VIO publication, digest of statistics and other reliable sources were also used for the study.

3.3.4 Sample Size and Sampling Techniques

The targeted population of the study takes the list of registered commercial vehicle drivers in motor parks of the major settlements along the routes. These settlements include Zuba, Gwagwalada, Kwali, Abaji, Gegu-beki, Koton-Karfi and Ganaja junction. In all, the average number of vehicles which loaded in the motor parks per day is 171 registered commercial vehicles that operate at the Seven (7) major towns. The commercial vehicles are physically located within the premises of the motor parks on a daily basis to undertake passenger and goods movement on a turn by turn basis. The various commercial vehicles operated are unified under the Umbrella name of National Union of Road Transport Workers (NURTW). Table 3.1 shows the number of registered commercial motor vehicles operators registered with NURTW per day.

Table 3.1: Number of registered commercial motor vehicles operators

S/N	Name of Motor Park	Total No. Of Commercial Vehicles
1	Zuba	47
2	Gwagwalada	21
3	Kwali	14
4	Abaji	24
5	Gegu-beki	15
6	Kotonkarfi	13
7	Ganaja Junction	37
Total		171

Author's Field Survey (2013)

A total of one hundred and seventy one (171) registered commercial motor vehicles operators along the studied route were taken as target population from which the sampled size were determined for the administration of questionnaire. The sample size for the study was computed using a formula developed by Yamane (1967) for determining the sampling size where a population is known.

The formula is given as follows;

$$n = \frac{N}{1+N(e)^2} \dots\dots\dots 1$$

Where,

n = Sample size;

N = Population size (171);

e = level of significance (set at 0.05 for this study)

Hence,

$$n = \frac{171}{1 + 171(.05)^2} \dots\dots\dots 2$$

$$= 120$$

The proportionate distribution of the sample by motor parks at the settlements is shown in Table 3.2.

Table 3.2: Distribution of Questionnaires by Motor Parks

S/N	Name of Motor Park	Total No. of Commercial Vehicles	Sample Size
1	Zuba	47	33
2	Gwagwalada	21	15
3	Kwali	14	10
4	Abaji	24	17
5	Gegu-beki	15	10
6	Kotonkarfi	13	9
7	Ganaja Junction	37	26
	Total	171	120

Source: Computed from Table 3.1

Where,

$$\text{Sample size per motor park} = \frac{\text{Motor park Population} \times \text{Sample size}}{\text{Total Population}} \dots\dots\dots 3$$

The study adopts a combination of quota and simple random sampling for the administration of the questionnaire for the collection of data required from the drivers and commuters. Quota sampling because the sampling size in each of the motor parks along the routes was be taken in proportion to the number of registered operators and simple random adopted to select the required sample size at each motor park giving each of the vehicle operators equal chance of being selected. This was supported by in-depth interviews with drivers and NURTW officials at the respective parks to have their opinion on the subject of investigation.

3.3.5 Methods of Data Collection

The questionnaire technique was used to elicit information from the commercial drivers along the locations mentioned above. The questionnaire is structured into two segments. The first segment collect information on the socio-economic attributes of the drivers, all together there were about seven questions here. The second segment seeks respondents understanding of RTC along the route and it covers issues of rate of occurrence, fatalities, major causes, attributes of the location among others. Refer to Appendix

The questionnaires were administered to commercial public drivers at the seven (7) survey points of survey. This is because the drivers travel more frequently on the road on a daily basis rather than private drivers who most often travelled seldomly.

The secondary data were RTC records documented by the Federal Road Safety Corp (FRSC) along the route over the period 2003-2012. The raw coding was further refined by the researcher in a manner that suits the subject of investigation.

3.3.6 Methods of Data Analysis

The analysis of data for the study involved the use of descriptive statistics and trend analysis which are presented in form of tables, percentages, line graphs, frequencies, bar and pie charts. Furthermore, mean, standard deviation and variance in SPSS package were used as further analytical tool.

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSION

4.1 INTRODUCTION

In this chapter, the data generated and/or gathered from survey research were analysed and result presented.

4.2 ANALYSIS OF DATA

A total of 120 questionnaires were produced and administered at the commercial public motor parks in seven (7) major points along Abuja-Lokoja highway based on our estimated sample size. Out of the 120 copies of questionnaire administered, 98 were completed and returned. This represents approximate of 80% return rate. The distribution of the questionnaires administered and returned is shown in Table 4.1. Hence, the effective sampled population whose responses have been analysed and presented in this chapter is 98.

Table 4.1: No of questionnaires distributed and returned

Point of Survey	No of questionnaire distributed	Total No returned	Percentage Returned
Zuba	33	26	78
Gwagwalada	15	14	93
Kwali	10	7	70
Abaji	17	15	88
Gegubeki	10	8	80
Kotonkarfi	9	6	67
Ganaja Junction	26	22	85
Total	120	98(80%)	

Source: Author's Field Survey (2013)

4.2.1 Socio-Demographic Characteristics of Respondents

The socio-demographic characteristics of the respondents were sought through the administration of questionnaire. These include sex of the respondents, age, occupation, level of education and marital status of the respondents. Table 4.2 presents the socio-demographic characteristics of the respondents across the seven survey points.

Nine-tenth of the respondent are males and no females among the respondents while the remaining did not indicate their sex so commercial vehicle drivers along the route can be said to be dominated by males. This is as result of the nature of the job, in Nigeria commercial drivers operate in an environment that is rough and harsh, which is not conducive for the females.

Table 4.2 Socio-demographic Characteristics of the Respondents

1	Gender	Frequency	Percent
	Male	92	93.9
	Female	-	-
	No Response	6	6.1
	Total	98	100
2	Age of Respondents	Frequency	Percent
	20 – 29	1	1.0
	30 – 39	26	26.5
	40 – 49	41	41.8
	50 – 59	27	27.6
	60 and above	-	-
	No response	3	3.1
	Total	98	100
3	Occupation	Frequency	Percent
	Civil Servant	-	-
	Self Employed	3	3.1
	Trader/Business Person	48	49.0
	Artisan/Professional	46	46.5
	Others	-	-
	No Response	1	1.0
	Total	98	100
4	Educational Status	Frequency	Percent
	No Formal Education	-	-
	Primary Education	11	11.2
	Secondary Education	83	84.7
	Tertiary Education	4	4.1
	Others	-	-
	No Response	-	-
	Total	98	100
5	Marital Status	Frequency	Percent
	Married	95	96.9
	Single	2	2.0
	Widowed	-	-
	Divorced	1	1.0
	Separated	-	-
	No Response	-	-
	Total	98	100

Source: Author's, Field Survey (2013)

The age of the respondents as shown in Table 4.2 indicates that about half of the drivers sampled are within the age group of 40 – 49 years, while one quarter of the respondents falls within the age bracket of 50 – 59 years. This revealed that most of the

drivers are within youthful and productive years. This implying that they can easily cope with the rigour and stress of the job.

The occupation of the respondents as revealed in Table 4.2 shows that the respondents are business persons and artisans as documented by about 97%. This implies that commercial drivers are into this occupation to make profit, and they are also artisans who are professionals in the act of driving.

A larger percentage of the respondents have secondary education that is basically important in the understanding of road traffic signs, highway codes and defensive driving principles. Table 4.2 further shows that three-quarter of the respondents have secondary education while the remaining one-quarter have either primary or tertiary education. Majority of the drivers are married, with nine-tenth of the total respondents' falls in the married category while one-tenth is single. This revealed that majority of the respondents who are commercial drivers are people with families and are expected to be responsible.

Table 4.3 Economic Characteristics of the Respondents

Variables			
1	Income per Month in Naira	Frequency	Percent
	1,000 - 10,000	1	1.0
	11,000 - 20,000	1	1.0
	21,000 - 30,000	16	16.3
	31,000 - 40,000	19	19.4
	41,000 - 50,000	24	24.5
	51,000 - 60,000	14	14.3
	61,000 - 70,000	14	14.3
	71,000 - 80,000	4	4.1
	91,000 - 100, 000	1	1.0
	No Response	4	4.1
	Total	98	100
2	Household Size	Frequency	Percent
	2 – 3	1	1.0
	4 - 5	31	31.6
	6 - 7	38	38.8
	8 - 9	20	20.4
	20 – 21	1	1.0
	No Response	7	7.1
	Total	98	100
3	Own/Drive Car	Frequency	Percent
	Yes	97	99
	No	-	-
	No Response	1	1
	Total	98	100
4	Vehicle Type	Frequency	Percent
	Car/Taxi	25	25.5
	Bus	66	67.3
	Lorry	6	6.1
	Trailer/Tanker	-	-
	Motor/tricycle	-	-
	Others	-	-
	No Response	1	1.0
	Total	98	100
5	Driving Experience	Frequency	Percent
	Less than 1 year	16	16.2
	1 – 5 years	71	72.4
	6 – 10 years	10	10.2
	10 years and above	-	-
	No Response	1	1.0
	Total	98	100

Source: Author's Field Survey (2013)

4.3 Economic Characteristics of the Respondents

Table 4.3 shows the following; per month, household size, own/drive car, vehicle type and driving experience of respondents. It shows that the dominant income of the respondents has been in the range of N21, 000 – N60, 000 monthly. Cumulatively, this accounts for a total of three-quarters of the total respondents. The household size of the respondents presented in the Table 4.3 shows that household size of 6 – 7 forms the dominant group of the respondents, followed by the respondents who are having 4 – 5 household size. The indication is that an average father who is a driver will probably have a wife and 2 – 9 children.

The study revealed that 99% of the respondents drive a vehicle. Also, buses form the dominant type of vehicles used by majority of the drivers for commercial transportation purposes along the route. This probably might be as a result of the capacity of this vehicle type in the carriage of passengers and goods. This is followed by cars used to carry passengers for commercial purpose from Abuja – Lokoja. This can be associated to the fact that some passengers prefer the level of comfort in car and the speed with which it can easily be loaded to buses thereby making drivers provide cars for commercial use.

The driving experience of the respondents along Abuja – Lokoja highway as presented in Table 4.3 shows that three-quarter of the respondents have been driving on the road between 1 – 5 years. This indicates that majority of the drivers surveyed have a driving experience that is adequate for them to provide necessary information that can be relied on for the purpose of the study.

4.4 FREQUENCY OF ROAD TRAFFIC CRASHES WITNESSED BY RESPONDENTS ON ABUJA – LOKOJA HIGHWAY

The study in a bid to analyze the characteristics of road traffic crashes between Abuja – Lokoja highway examined accident characteristics by considering frequency, nature and prevailing segment of crash on the road. This study reveals that road traffic crashes occur at least once or twice every week, this is shown in Table 4.4

Table 4.4 Frequency of Road Traffic Crashes Along Abuja - Lokoja

Frequency of RTC	Frequency	Percent
Daily basis	5	5.1
Once or twice a Week	90	91.8
Once or twice a month	-	-
Once or twice a quarter	-	-
Once or twice a year	-	-
No Response	3	3.1
Total	98	100

Source: Author's Field Survey (2013)

The result presented in Table 4.4 implies a high rate of crash occurrence on the road which might be as a result of high traffic volume on the road, because the route is a major road that links the southern states with the north through the Federal Capital territory. The single lane status of the road, the high trailer/tanker traffic, the ongoing construction works and drivers' recklessness are contributory factors to the observed RTA.

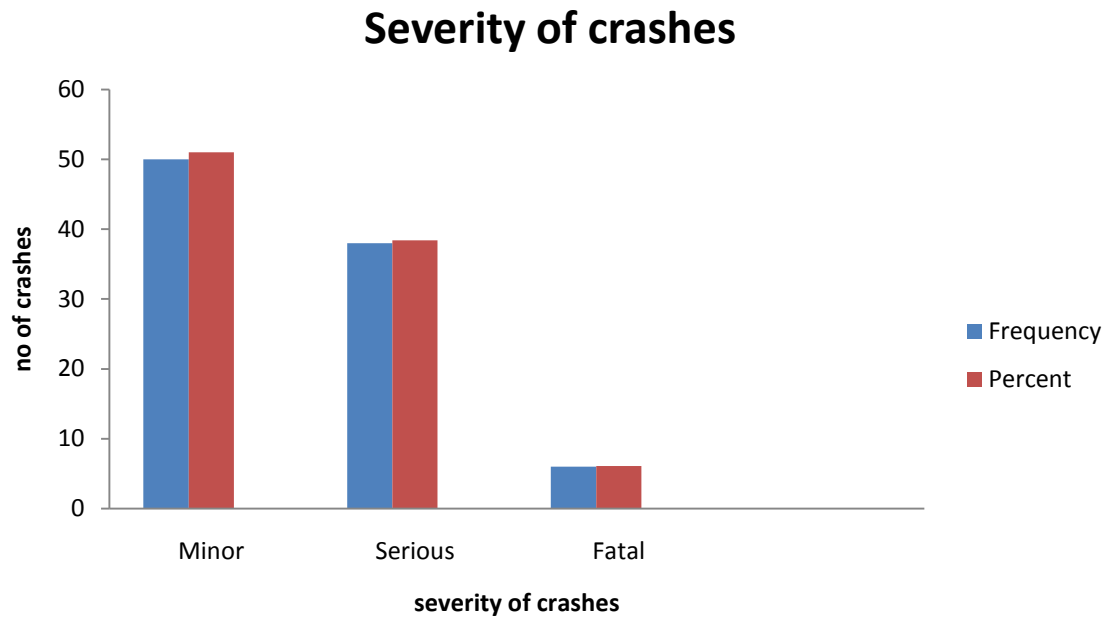


Figure 4.1: The Severity of Crashes on Abuja – Lokoja Highway

Source: Author’s Field Survey (2013)

The extent to which RTC is occurring on the road between Abuja and Lokoja on a weekly basis poses a serious danger to lives and properties. It also has a strong implication on the economic development of the nation because the number of vehicles loss to accidents if in a productive use could be a medium to contribute to the nation’s economy while damaged or loss lives also has great direct and indirect economic consequences.

The perception of the commercial drivers surveyed were sought concerning the severity of RTC they have witnessed between Abuja and Lokoja since they have been driving on the road on a daily basis. The severity of the accidents was classified as minor, serious and fatal according to the classification of the Federal Road Safety Corps (FRSC) in Nigeria. Hence, Figure 4.1 shows that more than half of the respondents classified RTC witnessed as minor involving little damage to vehicles and sometimes little injury sustained by passengers. Two-fifth of the respondents perceived majority of

RTC between Abuja and Lokoja as serious involving complete damage to vehicles and severe injuries to passengers while the remaining respondents viewed RTC on the road as fatal involving destruction of vehicles and loss of lives. This implies that most RTC along the highway leads to a loss in one way or the other, be it human or material.

For further examination of the characteristics of RTC along Abuja – Lokoja highway, the route was subdivided into two segment covering Zuba – Abaji and Abaji – Lokoja, this represent the two administrative jurisdiction the route passes through (FCT and Kogi state). The respondents were asked to give their view of which of the two segments has a higher rate of crashes, the outcome of this is presented in Figure 4.2.

Fig. 4.2 Crashes Road Segment

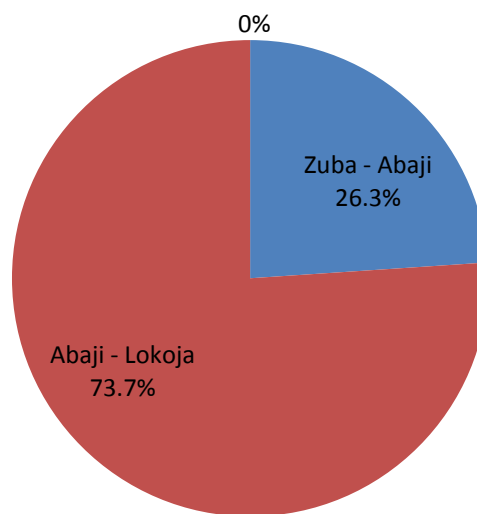


Fig 4.2 Dominant Crashes Road Segment between Zuba – Lokoja Highway

Source: Author’s field Survey (2013)

Figure 4.2 shows that about three-quarter of the respondents is of the view that crashes normally occur on the road between Abaji and Lokoja. This implies that most RTC that occurs along Abuja – Lokoja road takes place at various locations commonly

termed as the crash black spots. In this area the road is winding, the terrain is hilly associated with failed segments, intermittent breakdown of vehicles and bad/flagrant abuse of traffic rules and regulations by the drivers. In this leg of the highway the traffic is unusually heavy on most afternoons of weekends and weekdays. This is because the road at the moment is the only shortest link to the FCT from most states of the south. Even though the dualization has commenced since 2007, the progress rate is very slow and most of the uncompleted axis of the dualization falls in this segment.

4.5 Road Condition at Points of Crashes Along Abuja – Lokoja Highway

The condition of roads is seen to be part of the issues that characterises road traffic crashes on highways. It has been observed in Nigeria that most road crashes are as a result of the poor road condition. It has been highlighted that poor road conditions increase the chances of road user being involved in accidents on majority of Nigerian roads. This characterises the nature of road traffic crashes on highways across Nigeria which Abuja – Lokoja highway is not an exception. Hence, the questionnaire designed for this study seeks the view of the respondents regarding the description of road condition at crash scene along Abuja – Lokoja highway. Table 4.5 presents the result of the respondents’ description of the road topography at the scene of witnessed crashes along Abuja – Lokoja highway.

Table 4.5 Physical characteristics of the Road at the Crash scene

Variable	Frequency	Percent
Close to a narrow bridge	24	24.5
Around a sharp corner/bend	32	32.7
Towards a deep valley	17	17.3
At the approach of a hill	8	8.2
Potholes	10	10.2
Close to police check point	2	2
No Response	5	5.1
Total	98	100

Source: Author’s Field Survey (2013)

Table 4.5 shows that Narrow Bridge and sharp corner bend constitutes more than half of the main physical characteristics causing road crash along Abuja-Lokoja highway.

4.6 The Period of the Day That Traffic Crashes Occurs Along Abuja – Lokoja Highway

Time of the day and weather condition at which crashes occur on highways also characterises the nature of road traffic crashes. This is because the time of the day at which crashes occur on a road and at a particular segment of the road forms one of the characteristics of the road traffic crashes on the road. Road traffic crashes occur at a particular period of the day ranging from the morning, afternoon, evening and night hours. Table 4.6 presents the dominant period of the day for crash occurrence on the road. The table reveals that most crashes on Abuja – Lokoja highway occur in the evening hours of the day with about half of the people identified night journey been more vulnerable to auto crash. This might be as a result of drivers fatigue and tiredness because most traffic on the road is on a long distance trip which might have commenced very early in the morning either from the far southern or northern part of the country. Long time driving, easily leads to drivers’ tiredness and fatigue with the tendency for RTC.

Table 4.6 Dominant period of the day for Crash occurrence

Period of RTC	Frequency	Percent
at the morning hours	12	12.2
afternoon hours	29	29.6
evenings hours	43	43.9
night hours	11	11.2
No Response	3	3.1
Total	98	100

Source: Author’s Field Survey (2013)

Afternoon hour's crashes rate representing one-quarter of the respondents view shows that more crashes occur during the afternoon period followed the rate of crashes that occurs during the daily evening period. This might probably be as a result of the increased volume of traffic flow on the road as a result of daily business and commercial activities of commuters that usually generates competition for road space and in a bid causing crashes on the road. Most crashes that occur in the early morning hours and night time are as a result of poor visibility, though RTC is low in the night its impact can be severe due to poor rescue coordination.

The perception of crashes occurrence along on Abuja – Lokoja highway by the respondents revealed that majority of the crashes on the road occurs on weekends from Thursday to Saturday (See Fig 4.3). This characteristic nature of road traffic crashes on the road could be associated with an unusual increased traffic flow on the road during this time and the low level of road traffic enforcement by the law enforcement agents.

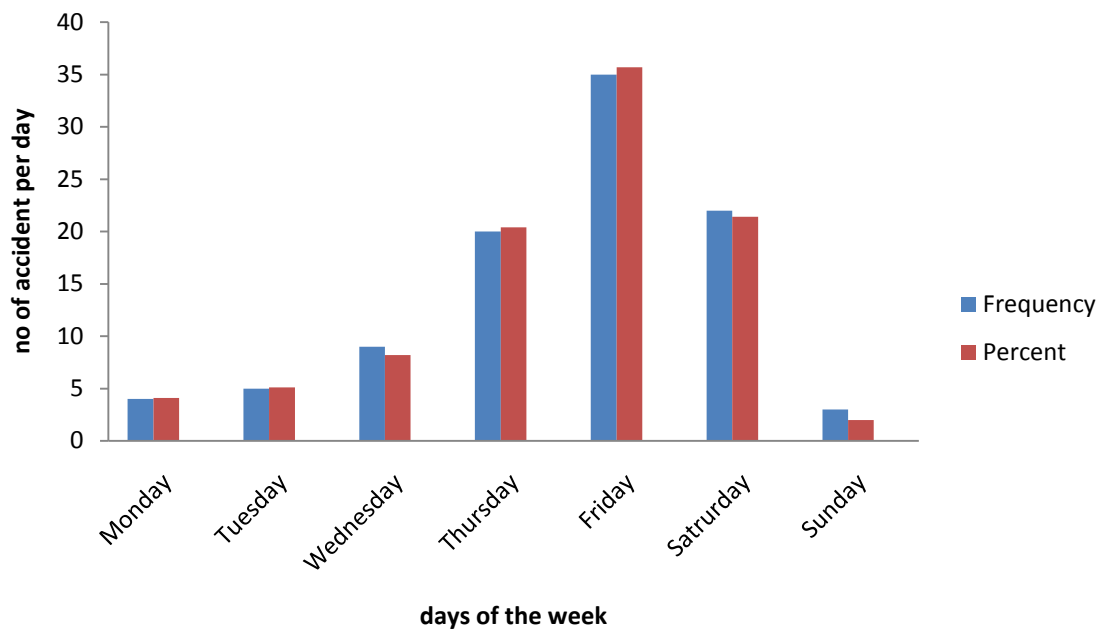


Figure 4.3: Weekly Road Traffic Crashes along Abuja – Lokoja highway

Source: Author's field Survey (2013)

The perception of the people on the months of the year with the highest frequency of crash, shows in Fig. 4.4 that more crashes occur between the month of October and December . This is result is understandable because the notorious ‘ember’ months which began from September is characterized with high volume of traffic on the road, high rate of recklessness, impatience etc all of which could leads to road crash.

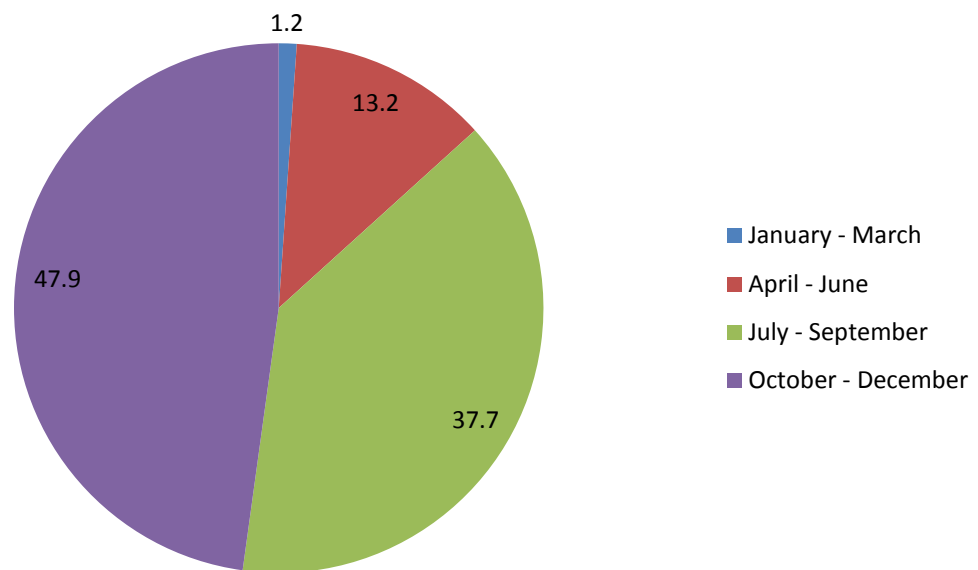


Figure 4.4: Monthly Perception of Crashes Occurrence on Abuja – Lokoja Road

Source: Author’s Field Survey (2013)

The vehicle types that are commonly involved in crashes on Abuja – Lokoja highway are shown in Table 4.7 that more buses are frequently involved in frequent crashes than other types of vehicles plying the road. These buses might probably be more of the commercial buses carrying passengers from location trip origin to destination using the route.

Table 4.7: Vehicle Types involving in Crashes

Factors	Frequency	Percent
Car/Taxi	35	35.7
Bus	50	51.0
Lorry	5	5.1
No Response	8	8.2
Total	98	100

Source: Author's Field Survey (2013)

4.7 Causes of Road Traffic Crashes along Abuja – Lokoja Highway

It is widely known that road traffic crashes do not occur without a cause. Varying degrees of factors are normally responsible for road crashes on every highway. In this regard, this study identified three major factors responsible for road crashes. These factors are: human influence, vehicle related factors, and physical environment. Table 4.8 shows the mean, standard deviation and variance of these factors.

Table 4.8: Descriptive Statistics of major causes of Crashes

Factors in RTC Causation	N	Mean	Std. Deviation	Variance
Human Influence	98	2.51	2.165	4.685
Vehicle Related Factors	98	.12	.597	.356
Physical Environment	98	.38	.753	.567
Valid N	98			

Source: SPSS Computation (2013)

It is indicative from Table 4.8 that human influences are the major cause of road traffic crashes on Abuja – Lokoja highway. This is because human related factors have the highest mean, standard deviation and variance values of 2.51, 2.165 and 4.685 respectively compared to the other two factors of vehicle and environment. The outcome of the result indicates that the higher the parameters value, the more significant is the variable.

A further probe into the causes of road traffic crashes on Abuja – Lokoja highway highlights the various probable causes of crash as variables under the three

major categorical factors (human, vehicle and environment) responsible for crashes on the road as presented in Table 4.9.

Table 4.9: Causes of Road Traffic Crashes on Abuja – Lokoja Highway

	Frequency	Percent
Human Influence		
Drivers Recklessness & dangerous driving	49	50
Stress and Fatigue	2	2.0
Negligence of pedestrian and other road users	1	1.0
Over speeding	27	27.6
Wrongful overtaking	9	9.2
Avoiding obstruction/animals	2	2.0
Under the effect of alcohol/drugs	1	1.0
Flashing and dazzling of headlights	3	3.1
No Response	4	4.1
Total	98	100
Vehicle Related Factors		
Tyre burst/pull-out	4	4.1
Break Failure	3	2.0
Steering/wheel lock	2	3.1
Defective lights/signals	2	2.0
No Response	87	88.8
Total	98	100
Physical		
Environment		
Bad Roads (Potholes)	28	28.6
Poor visibility (fog)	1	1.0
Heavy rainfall	1	1.0
Bad Weather	3	3.1
Absence of Road Traffic Signs	2	2.0
No Response	63	64.3
Total	98	100

Source: Author's Field Survey (2013)

The first issue to note from the Table 4.9 is the percentage value attributable to “No Response” from the respondents. Human influence has 4.1% “no response”, vehicle related factor has 88.8% “no response” and physical environment has 64.3% “no response”. The reason for the “no response” value is because the respondents do consider a particular factor to contribute to a witnessed crash on the road. This implies that human factors with the least “no response” value (4.1%) are the major causes of

road traffic crashes on Abuja – Lokoja highway. This result supports the major finding from Table 4.9.

Under the human influence is responsible for road traffic crashes, reckless and dangerous driving was found to be the major dominating cause of road traffic crashes on Abuja – Lokoja highway carrying 50% of the total response of the respondents identify it as the cause of witnessed crashes of the road. This was followed by drivers over speeding with 27% of the total response of the respondents. It is pertinent to note that the issue of over speeding has direct relationship with reckless and dangerous driving. This result implies that there exists a high tendency for road crashes when drivers are reckless and over speeding while driving.

The major vehicle related causes of crashes on the highway were tyre burst and break failure (See Table 4.9). The increasing case of road crashes as a result of vehicle tyre burst probably is the consequence of the purchase and use of used tyres known as “tokunbo” tyres by Nigerians. Most commercial drivers prefer to buy and fix used tyres on their vehicles for economic reasons. These used tyres imported into Nigeria are cheaper selling for between N2, 000 – N6, 000 depending on the size and grade. This cost is easily affordable by many average drivers who own a vehicle for private or commercial use because of the nature of economic hardship bedevilling Nigerians. Meanwhile, new unused tyres are selling at a cost believed to be exorbitant for most Nigerian that owns a vehicle. These new unused tyres are selling for a price between N10, 000 – N25, 000 depending on the size and make of the tyres. However, most drivers that buy and fix new tyres on their vehicles do continue to use the same tyre after the expiry date. The predominant act of using used tyres and over usage of tyres after expiry date by Nigeria drivers (commercial and private) is a major factor

responsible for high rate of tyre burst that is causing road traffic crashes on Nigeria highways.

Under the environment related factor responsible for road traffic crashes on the road, bad road condition characterised by pot holes forms the major cause of crashes on Abuja – Lokoja highway. This is because bad roads carry 28 representing 80% of the total respondents that chose environment factor as responsible for witnessed crashes on the road. It is no news that most of the roads in Nigeria are bad and in poor condition.

4.8 Measures of Reducing Road Traffic Crashes along Abuja – Lokoja Highway

The various possible measures that can be employed to reduce the menace of road traffic crashes on Abuja – Lokoja highway were highlighted to include redesign and expansion of the road, regular patrol by law enforcement agents, involvement of stakeholders such as NURTW, drivers training and attitudinal re-orientation, and strict implementation of vehicles roadworthiness and inspection. The Table 4.10 shows the result of the response of the respondents with a view to identifying which of the possible measures can adequately reduce the rate of crashes on the road.

Table 4.10: Suggested Measures Reducing Crashes on Abuja – Lokoja Expressway

Suggested Measures	Frequency	Percent
Redesign and Expansion of the road	70	71.4
Regular patrol by law enforcement agents	9	9.2
Drivers training and attitudinal re-orientation	11	11.2
Effective vehicles roadworthiness and inspection	5	5.1
No Response	3	3.1
Total	98	100

Source: Author’s Field survey (2013)

An examination of the Table 4.10 shows that redesigning and expansion of the road will be an effective measure to reducing the rate of crashes on the road. Three-quarter of the respondents suggested it as a major measure to reducing crashes rates on the road, next to it is drivers training and attitudinal re-orientation than regular patrol by

law enforcement agents and strict implementation of vehicles roadworthiness and inspection had only 5.1% of the suggested possible measures to reducing road traffic crashes on Abuja – Lokoja highway.

It is worthy to note that the road under the scope of this study was first awarded to contractors for dualization in 1999 and the contract agreement failed, after this first award there had been other attempts by government to expand the road that failed in one form of contract agreement policy or the other. However, since 2010, the Federal Government has been making frantic efforts to ensure the completion of the dualization of Abuja – Lokoja highway.

4.9 Recorded Causes of Road Traffic Crash

The secondary data collected from the records of the Federal Roads Safety Corps (FRSC) Kogi state and the FCT sector commands on the causes of road traffic accidents on Abuja – Lokoja highway was divided into two segments. The segments are Zuba – Abaji and Abaji-Lokoja.

The reported and recorded incidence of road traffic accidents and their causes from 2003 - 2012 between Zuba and Abaji is presented in Table 4.11. it shows that 2010 records the highest cases of accidents with 432 followed by 2012 having 310 cases 2009 had 304 cases, there was a total of 286 reported cases in 2008 while 2011 recorded 252 cases, 2007 recorded 230, 2006 recorded 249cases, 2005 recorded 240 cases, 2004 recorded 202 cases and 2003 recorded 177 cases.

An examination of Table 4.11 revealed that loss of control (LOC) accounts for the cause of highest number accidents being a total of 592 cases over the period of study between Zuba and Abaji on Abuja – Lokoja highway. LOC resulted into a total of 23,

28, 32, 42, 58, 68, 56, 100, 86 and 99 causes of crashes in 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011 and 2012 respectively.

Table 4.11: Causes of Crash on Zuba – Abaji Segment of Abuja – Lokoja Highway

Crash Causes	Years										Total
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Mechanical Deficient Vehicle - MDV	11	8	15	17	8	15	19	25	11	12	141
Loss of Control - LOC	23	28	32	42	58	68	56	100	86	99	592
Speed Limit Violation – SLV	25	33	16	19	23	21	29	35	19	23	243
Wrong Overtaking – WOV	33	30	43	25	28	30	33	53	32	40	347
Dangerous Overtaking - DOT	15	21	21	28	20	26	26	53	28	28	266
Speed Violation - SPV	26	28	52	31	38	39	51	51	34	46	396
Dangerous Driving - DGD	17	21	22	40	22	23	30	52	20	24	271
Tyre Burst – TBT	11	9	15	16	15	22	16	24	06	23	157
Bard Road - BRD	04	03	03	07	04	08	07	04	02	01	43
Obstruction - OBS	01	02	01	03	03	06	12	06	03	03	40
Light Caution Violation - LCV	-	-	03	02	-	04	06	01	01	01	18
Road Violation - ROV	07	11	09	09	08	10	11	19	04	03	91
Potholes	03	06	06	06	02	06	07	05	05	02	48
Driving under Alcohol - DAD	01	02	02	04	02	03	02	03	02	06	27
Total	177	202	240	249	230	286	304	432	252	310	2680

Source: FRSC (2010)

Speed violation and dangerous overtaking each account for another major cause of crashes between Zuba and Abaji with a total 243 cases and 266 cases over the years of study respectively. This indicates that majority of the crashes between Zuba and Abaji segment of Abuja – Lokoja highway are caused by drivers' loss of vehicle control, road speed limit violation and wrongful overtaking. These three major causes of crash on this segment of the road under study can be grouped under human related factor responsible for crashes on the highway. This is because each of them can be attributed to the attitude of drivers on steering. It then implies that the findings from the secondary data is in line with the findings of the primary data and observations from literature, that over 90% of road traffic crash reported cases are caused by human related factors along on Abuja – Lokoja highway

The second segment of the road under study is between Abaji- Lokoja. The various recorded causes of crashes from 2003–2012 on the segment of the road is presented in Table 4.12. the table revealed that dangerous overtaking (432), loss of control (515), and speed limit violation (414) form the major causes of crashes on the segment of the road between Abaji and Lokoja from 2003 – 2012. It therefore implies that dangerous Overtaking has been the major causes of road crashes on this segment of the road.

This issue relates to the fact that drivers in their bid to achieve reduced journey time become impatient to the extent that they behaviourally disregard driving safety rules at the points of overtaking other vehicles on the road. It has become a frequent scene to witness drivers overtaking other vehicles when the road is not clear, at steep, at a bend, on a narrow bridge and so on. This attitude of drivers is resulting into major crashes on Nigeria highways on a daily basis.

Table 4.12: Causes of Crash on Abaji – Lokoja Segment of Abuja – Lokoja Highway

Causes of Crash	Years										Total
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Mechanical Deficient Vehicles – MDV	16	17	18	23	28	23	23	33	34	22	237
Loss of Control – LOC	37	37	36	44	44	41	37	66	83	90	515
Speed Limit Violation – SLV	37	49	36	34	34	43	39	44	54	42	414
Dangerous Overtaking – DOT	34	38	55	47	38	27	40	67	49	37	432
Speed violation - SPV	17	10	10	14	13	14	19	24	19	17	157
Dangerous Driving – DGD	6	15	22	20	17	13	27	50	23	28	221
Tyre Burst – TBT	4	5	5	11	9	11	7	14	10	26	102
Bad Road – BRD	1	1	1	2	7	3	3	1	2	1	22
Wrong Overtaking	18	26	33	57	42	22	28	39	61	70	396
Obstruction - OBS	2	2	2	2	2	2	2	2	7	3	26
Break failure -BFL	1	1	1	-	-	1	1	1	1	7	14
Driving under the Influence of Alcohol - DAD	-	-	-	2	1	-	-	1	1	2	07
Road Violation - ROV	2	1	3	2	1	4	7	5	5	2	30
Light Caution Violation - LCV	2	4	-	-	3	2	1	5	5	4	26
Potholes	3	4	2	2	3	3	4	3	2	2	28
Total	180	210	224	260	242	209	238	355	356	353	2627

Source: FRSC (2013)

The yearly crash record in the leg shows gradual increases with 180 reported cases in 2003, to the highest 355 and 356 in 2010 and 2011 respectively, until it slightly reduces to 353 in 2012. The rhythm and dynamic of RTC variation in the years can be attributed to the increase of vehicular traffic on the route over the years. The reduction in 2012 maybe as a result monitoring and patrol by FRSC and VIO, along the segment.

4.10 Types of Vehicles Involved in Crashes on Abuja – Lokoja Highway

All crashes on highways normally involve one type of vehicle or the other. It is evident that there are various types and sizes of vehicles that ply major and minor highways in Nigeria at minute intervals. These vehicles range from cars to heavy trailers. The vehicles are cars, pick up/van, trucks, lorry, buses, trailers, tankers, tricycles, motorcycles and bicycles. In line with this, the secondary data collected from the records of FRSC on the Abuja – Lokoja highway with two divided segments gave the types of vehicles that are involved in accidents along the road from 2003 – 2012.

Table 4.13 shows the accident vehicle types and the number of recorded cases of each vehicle types on Zuba-Abaji segment of the road. The table shows that cars involved in more crashes on the segment of the road than other vehicle types for the years under consideration. It revealed that cars had a total of 79 recorded crash cases in 2003 as the least number of cases and 252 as the highest number of cases in 2010 for the years under consideration. This is followed by buses having crash recorded cases of 45 in 2005 that increased to 142 by 2010. The reason for cars involving in the highest cases of crashes can be attributed to the fact that cars have the highest volume of traffic on roads. This can be attributed to the nature of the use of cars such as Toyota, Opel, Honda, Volkswagen salon and wagon cars, by commercial owners and private vehicles owners. The recent increasing rate of car ownership in Nigeria as a result of increase in

workers' salary and wages is another factor contributing to increasing private car traffic on the road since Abuja is the Federal Capital city of the country. These private drivers who drive themselves on the highway may tend to be involved in crashes for lack of ability to cope with driving stress and fatigue on the highway like the professional driver on a busy highway of this nature

Table 4.13: Types of Vehicles Involving in Crashes on Zuba - Abaji of Abuja – Lokoja Highway

Vehicle Types	Year										Total
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Cars	79	99	85	90	103	126	198	252	153	216	1401
Pick up/Van	13	7	7	17	12	17	30	36	16	26	181
Trucks/Lorries	14	19	19	18	16	21	32	37	36	30	242
Buses	53	62	45	76	65	73	110	142	81	114	821
Trailers/Tankers	61	76	58	50	66	62	57	97	43	90	660
Motorcycles	24	40	31	23	31	32	48	61	89	99	478
Bicycle	1	-	1	5	1	1	-	1	3	5	18
Total	245	303	246	279	279	332	475	626	421	580	3801

Source: FRSC (2013)

Table 4.13 also shows that motorcycles have a high rate of crash cases on road segment between Zuba and Gwagwalada on the Abuja – Lokoja highway. This accounts for a total of 478 crash cases over the years of study covering year 2003 – 2012. The increased incident of motorcycles crashes on the road segment around Zuba, Giri and Gwagwalada can be attributed to the nature of land use activities taking place on the road primarily because of the population of people residing in the two communities, and the consequent commercial activities prevailing in the area. However, bicycle, pick-up vans and trucks/lorries have the least incidence of 18, 181 and 242 respectively.

Table 4.14: Types of Vehicles Involving in Crashes on Abaji –Lokoja of Abuja – Lokoja Highway

Vehicle Types	Year										Total
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Cars	144	124	111	99	101	132	180	256	179	215	1541
Pick up/Van	16	11	10	20	14	27	49	48	25	33	253
Trucks/Lorries	9	12	12	21	15	14	25	40	36	34	218
Buses	102	138	70	70	68	83	140	173	127	136	1107
Trailers/Tankers	48	43	45	48	48	46	54	70	45	93	537
Motorcycles	9	9	16	10	16	16	21	31	42	44	214
Bicycle	01	-	04	03	-	-	-	01	05	02	16
Total	329	337	268	271	261	318	469	618	458	557	3886

Source: FRSC (2013)

Abaji – Lokoja segment of the road recorded a total case of 3886 crashes involving different vehicles from the year 2003 – 2012 according to the records of FRSC presented in Table 4.14. The Table further shows that cars (1541 cases) also accounts for the highest number of crash cases on the road segment followed by bus (1107 cases). However, 537 crashes cases involving trailers/tankers on this segment of the road can be attributed to the high demand for various types of freight movement between the southern and northern part of the country. As the major link between the northern Nigeria and the port cities of the south as well as the industrial pocket of Obajana and Ajaokuta, the trailer/tanker traffic along the road has raising significantly, yet the road is still a single lane. The motorcycle traffic crash reduced because there are fewer major towns along this leg of the route.

A critical examination of Table 4.13 – 4.14 identified that car as a vehicle type forms the dominant vehicle involving in crashes on Abuja – Lokoja highway. The tables also identified that involvement of buses in crashes on Abuja – Lokoja highway is next to cars. However, crash cases involving trailers/tankers rated as the third vehicle type involving in crashes on Abuja – Lokoja highway.

4.11 Trend Analysis of Crash Rates and Casualties on Abuja – Lokoja Highway from 2003 - 2012

News of one road traffic crash or the other has become the major headline of newspapers and radio and television station in every part of the country. One can correctly predict that multiple crashes are taking place on Nigeria highways at any point in time. This prediction can be based on broadcast news reports, while many others at large are not reported in the news. In this view, the study analyse the trend of RTC cases and its consequent casualties on Abuja – Lokoja highway from 2003 – 2012. Crash cases on roads are classified as fatal, serious and minor while accident casualties are classified as the injured and the killed. The whole cover of the road was divided into two segments, and data was collected on each segment of the road on crash cases and casualties from the records of the FRSC. The two segments of the road are Zuba – Abaji and Abaji – Lokoja.,

Generally, discussions on trend analysis, centres on identifying the pattern which the reported cases of crash display over the period of investigation. In this regard, three general trend patterns can be exhibited;

- i. Trend pattern, which shows the nature of increase, decrease or stagnation over the period of iinvestigation
- ii. Regular or cyclical pattern, which attempt to establish whether or not, there are recurring occurrences at definite period of the year interval which may be attributed to traffic volume increase/decrease, weather or road conditions, period of the year among other
- iii. Erratic pattern, which shows sudden shift / changes in the general pattern due to factors that, cannot be attributed to a particular reason.

The Figure 4.5a shows the trend of crash cases recorded on Zuba – Abaji segment of the road under study from 2003 – 2012. The figure shows that serious crash cases are more frequent on the road segment than the other two classified types of crash cases. The trend of serious crash cases on the segment of the road increases from 36 in 2003 to 209 in 2012. It implies that serious crash cases on the road is major and on gradual increase over the ten years scope of study.

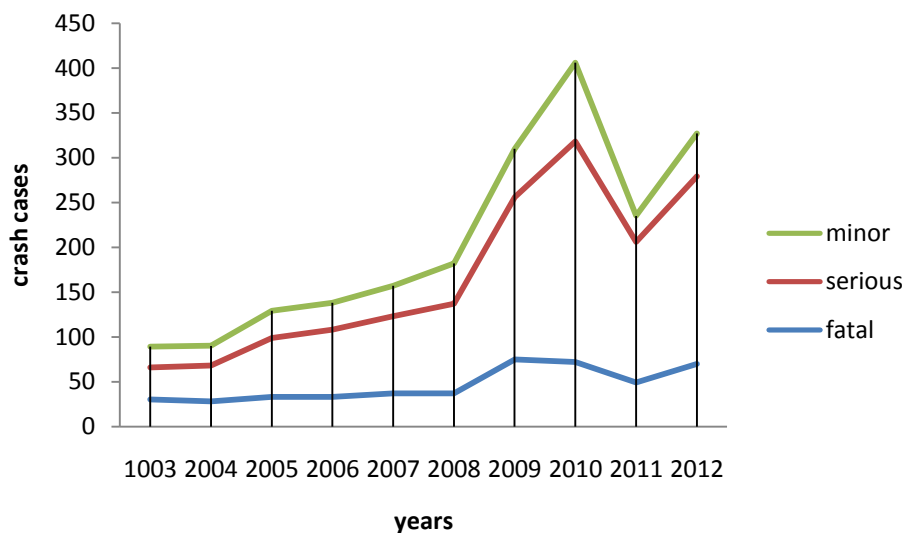


Figure 4.5a: Trend of Crash cases on Zuba–Abaji segment

Source: Adapted from FRSC Record (2013)

The trend of minor crash cases between Zuba and Abaji shows that crash cases stood at 23 in 2003, 30 in 2005, and 45 in 2008 increased to 88 cases in 2010 and came down 29 in 2011 and by 2012; it increased to 48 cases. However, the fatal crashes on the road segment have a close range of trend that started from 30 in 2003, 28 in 2004, 37 cases in 2008 to 70 cases in 2012 across. In the 3 classes of crash, there is a general increase from 2003 to 2012, but the degree of increase was more on fatal cases, minor RTC exhibited a sharp erratic feature between 2009 - 2011 which may be attributed to improved traffic enforcement and management practices by the relevant organ of

government like the FRSC and VIO. However, there is cyclical regime noticed over the years on the route.

Figure 4.5b shows the trend of casualty rate of crashes on the Zuba – Abaji segment of Abuja – Lokoja highway. It shows that the number of people injured in crashes is more than the number of people that are killed by crashes. The number of injured persons in crashes on the road segment increases from 196 in 2003, 215 in 2006, 451 in 2008 to 1138 in 2012.

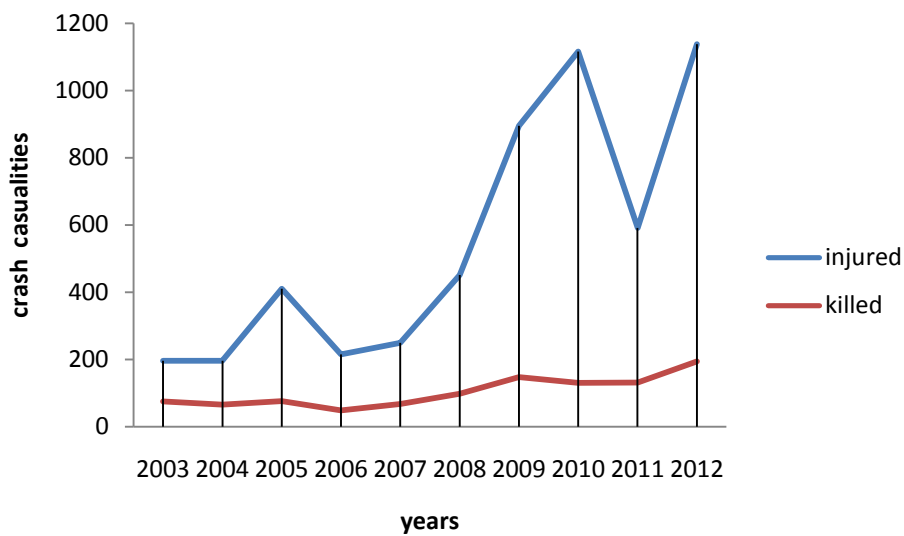


Figure 4.5b: Trend of Crash Casualties on Zuba–Abaji segment.

Source: Adapted from FRSC Record, 2013

The trend of road traffic crash cases on the Abaji – Lokoja segment of the road is presented in Figure 4.6a. The rate of road traffic crashes on Abaji – Lokoja segment of the road revealed that there are more recorded incidences of fatal road traffic crashes than the minor and serious crashes. It also indicates an increasing rate in the trend of crashes from 50 in 2003 to 205 in 2012. Generally, minor crash cases were low in 2003 (31 cases) to 88 cases which is the highest in 2010. Both the fatal and serious cases are running neck-neck. The higher figure of fatality as noted here could be as a result of the

bad and winding nature of the road along this axis, and perhaps poor monitoring and enforcement by the law enforcement agencies.

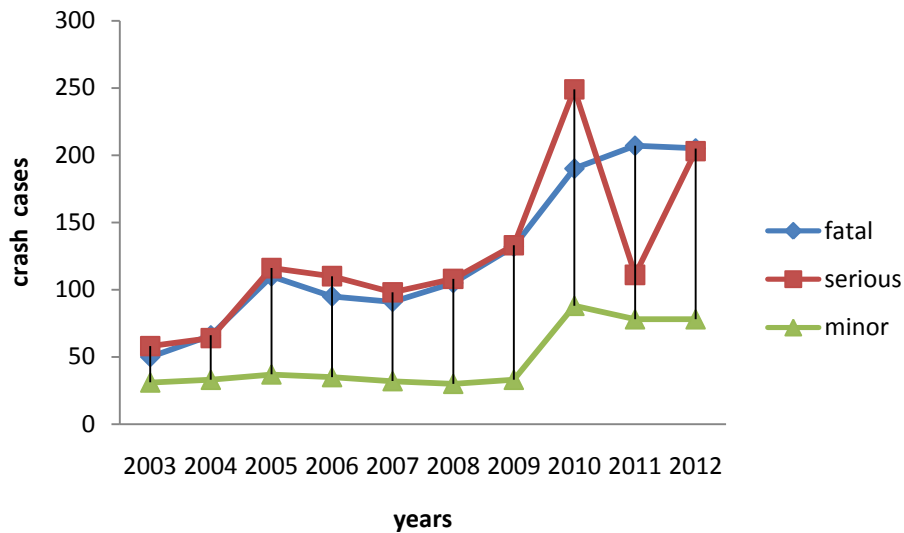


Figure 4.6a: Trend of Crash Cases on Abaji - Lokoja segment

Source: Adapted from FRSC Record, 2013

For the trend of crash casualties, the number of injured persons involved in crashes on the road segment increases from 213 in 2003, 330 in 2005, 389 in 2008 to 1438 in 2011 and 1169 persons in 2012, while the number of persons killed in crash cases on the road segment stood at 57 in 2003, 89 persons in 2008, and increased to 194 in 2011 than 171 in 2012. The highest cases of injuries and fatalities were noticed in 2011.

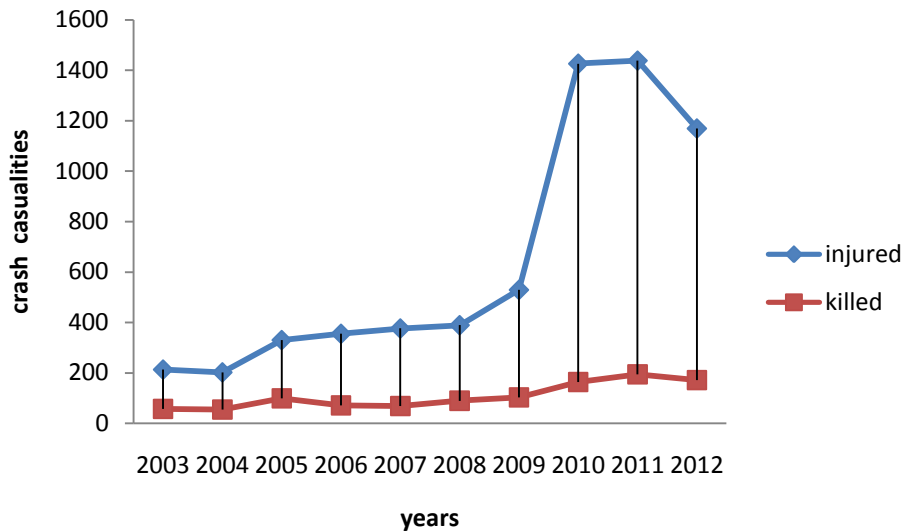


Figure 4.6b: Trend of Crash Casualties on Abaji - Lokoja segment

Source: Adapted from FRSC Record (2013)

4.12 Temporal Analysis of Road Traffic Crashes Occurrence on Abuja – Lokoja Highway

Data on the rate of road traffic crashes on Abuja – Lokoja highway from 2003 – 2012 were classified into hours of crashes occurrence in each of the month in the year for further analysis in order to bring out the time and seasonal variations in road traffic crashes occurrence along the road. As a result, Figure 4.7 shows the time of occurrence recorded crash cases Zuba – Abaji segment of Abuja – Lokoja highway. The Figure shows that most crashes on the segment of the road occur in the afternoon between 12pm – 6pm with a total of 929 reported cases followed by crash cases that occurred in the morning time between 6am – 12pm with a total of 870 cases from 2003 - 2012. This can be attributed to the increased volume of traffic that characterises day time operations, bad conditions of the road and attitudinal factors of the drivers which they exhibit in the form of over speeding, wrong overtaking, and lane violation among others.

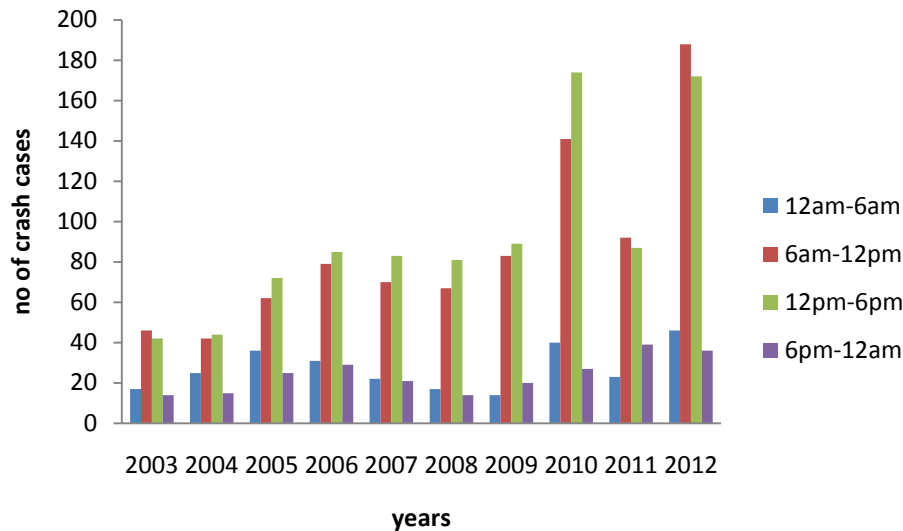


Figure 4.7 Time of crash cases between Zuba-Abaji

Source: Computed from FRSC Record, 2013

The number of crash cases reported to have occurred between 12 midnight and 6am appears the lowest generally because traffic volumes are usually low at this period of the day as many motorists do not travel at this time while commuting daily activities that require transportation are quite minimal. But it must be noted that road accident during the night whenever it happens can be fatal. This is because; it normally involves large haulage vehicles like trailers and tankers. In addition, rescue operations by FRSC and VIO during the night is relatively poor because of limited operational capacity and passers' by may be afraid to render help for fear of falling a victim of other miscreants who deceived unsuspecting motorists. A further view of Figure 4.7 shows that majority of the crashes recorded for each of the years happens 6am – 12noon and 12noon – 6pm.

The Figure 4.8 shows the time of crashes occurrence on Abaji –Lokoja segment of the highway. The figure shows the hours that the recorded crashes occur on the road segment from 2003 – 2012. Figure 4.8 indicates that majority of crashes cases on the road segment happened between 6am and 6pm across the years under consideration. Therefore, the total number of crash cases recorded to have occurred on Abaji – Lokoja

segment of the road have 279 cases that occurred at 12am – 6am, 1092 cases between 6am – 12pm, 1098 cases between 12pm and 6pm and only 226 cases between 8pm and 12midnight. Hence, the hours of 12pm – 6pm accounts for the prevailing time of crash cases on this segment of the road between Abuja and Lokoja.

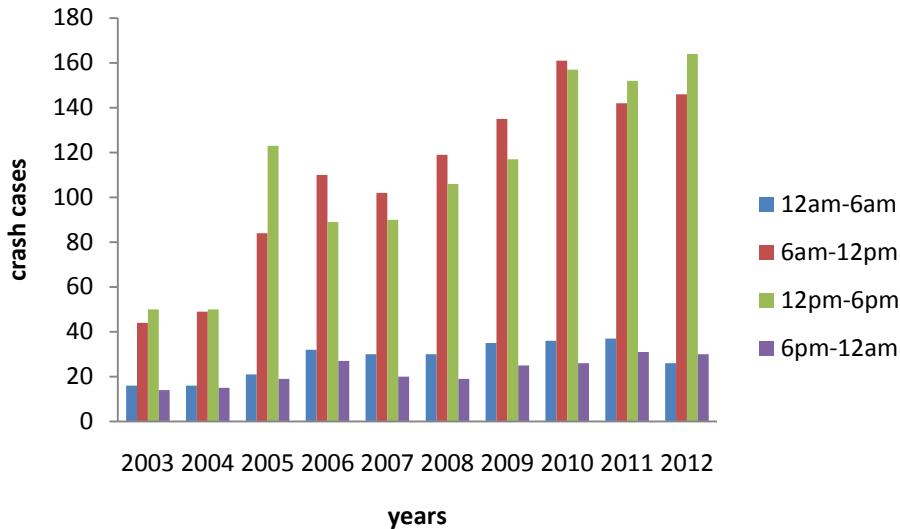


Figure 4.8: Time of accident cases between Abaji – Lokoja

Source: Computed from FRSC (2013)

The records of FRSC on the time of road traffic crashes cases on Abuja – Lokoja highway as presented in Figure 4.7 – 4.8 had shown that majority of the crash cases on the road occurred during the day time between the 6am – 6pm when traffic volume is high with competition on the road space and infrastructure.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 INTRODUCTION

This chapter provide the summary of major findings, make conclusion and proffer some recommendations on the basis of the findings made in the study.

5.2 SUMMARY OF FINDINGS

The aim and objectives of this study centred on the analysis of road traffic crashes on Abuja – Lokoja highway, as highlighted from the onset of the work, the analysis is based on reports of road traffic crash from year to year over a period of ten (10) years time frame (2003 – 2012) showing types of vehicles involved and periods of the day it commonly occurs. The study used both primary and secondary sources of data. The primary sources of data (questionnaire) were obtained using quota and simple random sampling technique on the respondents at the seven (7) motor parks. Secondary sources of data were collected from the records of Federal Road Safety Corps (FRSC) on reported crash cases, its causes, vehicles involved and time from 2003 – 2012. The data obtained were analysed using descriptive statistic and trend analysis involving tables of percentage, line graphs and histogram. The study came up with several findings which are;

(1) That human related factors are responsible for majority of crash cases on the road. These causes range from loss of control; speed limit violation and wrong overtaking are classified as drivers' recklessness and refusal to obey traffic rules. This agreed with the study of Bako and Musa (2011) in their study of RTC occurrence on selected roads in urban Zaria used a combination of questionnaire survey, hospital and FRSC record to determine the rate of RTC occurrence per day, month and year in urban Zaria, the result

attributed major causes of RTC to drivers recklessness, refusal to obey traffic regulations. This study also agreed with the work of Dawan and Obieikhalu (2011) study on the analysis of the major causes and costs of RTC in FCT. The study identified more drivers' related causes of RTC which include; dangerous driving, speed violation, overtaking, traffic violation and road hazards violation.

(2) That redesigning and expansion of the road will serve as a major effective measure to reduce crash rates on the expressway.

(3) That cars and buses are vehicle types that frequently involve in crashes on the road. However, there was a high record of motorcycles crashes between Zuba and Abaji segment of the road.

(4) The three classified types of crash cases by FRSC (fatal, major and serious) occurred on the two segments of the Abuja – Lokoja highway; the study shows that serious type of crash cases are predominantly recorded across the segments of the road.

(5) The rate of crash casualties was examined and the study revealed that more persons involved in crashes on the two segments of the road were injured than the number of persons that were killed by crashes on the road.

(6) Finally, the time of crash occurrence cases on the road were analysed by the study based on each segment of the road and found that majority of the crash cases on the road occurred during the daytime particularly between from 6am – 6pm along the classified route.

5.2 RECOMMENDATIONS

Arising from the findings above the following recommendations were offered to reduce the level of RTC along Lokoja- Abaji- Zuba highways.

1. Federal Road Safety Corps (FRSC) and other government organisations involved in traffic management in Nigeria should improve their efforts at sensitising and educating the public especially the drivers on the need for proper behaviour while on steering. Since the driver of a vehicle is the most important determinant of the occurrence of a crash, the quality of drivers on the roads in the study area cannot be over-emphasised. Consequently, training and retraining of drivers on defensive driving, Highway Code understanding, attitude enhancement should be a basic effort towards reducing RTC. The training and retraining of drivers constitute a formidable means of effectively dealing with the issue of road traffic crash reduction.
2. Regular monitoring and patrol by FRSC and VIO with the objective of checking the excesses of drivers along the routes should be intensified, with particular focus on the Abaji – Lokoja axis, where the road is more narrow/ winding and where more casualties were recorded.
3. It is evident that the traffic carrying capacity of the road has been exceeded, judging by the volume of vehicles that ply the road on a daily basis. Therefore, the dualization effort that is on-going on the study area should be intensified. This will increase the capacity of the road to accommodate more traffic, thereby reducing vehicle competition for space on the road.
4. The stakeholders, drivers, passengers, unions (NURTW) and NGOs can also help in sensitising and educating the public on the need for proper behaviour while on steering.

5.3 CONCLUSION

Road traffic crash, a well documented consequence of motorization is the leading cause of deaths in Nigeria. While crashes occur in all modes of transport, including air and rail the degree and magnitude of road traffic crashes on the road mode is indeed alarming, especially with the fact that, it involves the young and active age bracket of the population. Effort at bringing down the tide of RTC is the responsibility of all as living safely is a challenge that must be accepted by everyone if we are to continue to move forward in an ever-changing society. Generally, Nigerians have been found to exhibit nonchalant attitudes to traffic regulations, as such traffic offence has become a regular behavioural tendency among various classes of road users. Thus, an obvious policy question is how to increase the level of compliance of road user's with traffic regulations so as to reduce the level of traffic offences. There is need to create avenues through which road users' behaviour can be improved upon in order to conform to existing road safety norms.

This study has therefore contributes to the search for policy actions on road safety management. In this regard, the study concludes that we must emphasize that within the variable traffic equation, one constant element remains which is the human being behind the wheels. Roads can be built or improved, and vehicles may be better designed to operate under adverse conditions, while a more forgiving environment for transport can be created, but shaping and reconstructing human behaviour remains a major challenge. This understanding and consideration must form the focus of all road safety management actions in the country and this is a wake-up call to all road users in Nigeria.

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I am an M.Sc student in the Department of Geography, faculty of sciences,
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I am conducting a research on “Analysis of road traffic crashes along Lokoja-
Abuja highway”.

This is part of the requirement for the award of the M.Sc degree in Geography. I
will be very grateful if you will kindly assist by completing the attached questionnaire

All information provided would be treated as confidential.

Maina Williams Esther

Researcher

A. SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS

1. Sex: a. Male [] b. Female []
2. Age: a. 1-18 years []
b. 19-40 years []
c. 41-60 years []
d. 61 and above years []
3. Occupation: a. Civil Servant []
b. Private Company/ Employee []
c. Self Employed []
d. Trader/Business Person []
e. Artisan/Professional []
e. Others Specify .. []
-
4. Level of Educational Attainment:
a. No Formal Education []
b. Primary School []
b. Secondary School []
c. Tertiary Education []
f. Others Specify .. []
5. Marital Status: a. Married []
b. Never married []
d. Widowed []
e. Divorced []
f. Separated []
6. Income Level per month: a. ₦1-18,000 []
b. ₦ 18,001-30,000 []
c. ₦ 30,001-45,000 []
d. ₦ 45,001-60,000 []
e. ₦ 60,001- 75,000 []
f. ₦ 75,001- above []
7. Household size? a. 1-2 []
b. 3-4 []
c. 5-6 []
d. 7 and above []

Section B: Respondent (Divers) knowledge of Road Traffic Accident Along Abuja-Lokoja Expressway

8. Do you own a car? a. Yes [],
b. No []
9. If yes, what type: a. Car/taxi []
b. Bus []

- c. Lorry []
- e. Trailer /Tanker []
- f. Motor/tricycle []
- g. Bicycle []
- h. others specify

10. How long have you been driving along the route (Abuja-Lokoja)?

- a. Less than 1 year []
- b. 1-5 years []
- c. 6-10 years []
- d. 10 years and above []

11. Have you ever witnessed road accident along Abuja-Lokoja Highway?

- A. Yes [],
- b. No []

12. If yes, how many times have you witnessed Road Accident Along this route?

- a. 1 []
- b. 2 []
- c. 3 []
- d. above 3 []

13. How often does the accident occur?

- a. Daily []
- b. Weekly []
- c. Monthly []
- d. yearly []

14. How will you describe the nature of the accident?

- a. Minor []
- b. Serious []
- c. Fatal []

15. Which segment(s) of the road does the accident normally occur?

- a. Zuba- Gwagwalada []
- b. Gwagwalada- Kwali []
- c. Kwali- Abaji []
- d. Abaji- Gegu-beki []
- e. Gegu-beki- Kotonkarfi []
- f. Kotonkarfi- Lokoja []

16. Have you ever been involved in Road Accident along Abuja- Lokoja Expressway?

- A. Yes [],
- b. No []

17. If yes, how many times have you been involved?

- a. 1 []
- b. 2 []
- c. 3 []
- d. above 3 []

18. How will you describe the nature of the accident?
- a. Minor []
 - b. Serious []
 - c. Fatal []
19. If serious, how many people were injured in the accident?
- a. 1 []
 - b. 2 []
 - c. 3 []
 - d. above 3 []
20. If Fatal, how many people died in the accident?
- a. 1 []
 - b. 2 []
 - c. 3 []
 - d. above 3 []
21. Which segment of the road does the accident normally occur?
- a. Zuba- Gwagwalada []
 - b. Gwagwalada- Kwali []
 - c. Kwali- Abaji []
 - d. Abaji- Gegu-beki []
 - e. Gegu-beki- Kotonkarfi []
 - f. Kotonkarfi- Lokoja []
22. Give a brief description of the road at the accident scene?
- a. close to a narrow bridge []
 - b. around a sharp corner/ bend []
 - c. towards a deep valley []
 - d. at the approach of a hill []

 - e. around a road construction site []
 - f. close to police check point []
 - g. others specify
23. What period of the day does the accident happen?
- a. at the morning hours []
 - b. afternoon hours []
 - c. evening hours []
 - d. night hours []
24. What days of the week does the accident happens?
- a. Monday []
 - b. Tuesday []
 - c. Wednesday []
 - d. Thursday []
 - e. Friday []
 - f. Saturday []
 - g. Sunday []

25. What Months of the year do the accident happen?
- a. January- March []
 - b. April- June []
 - c. July- September []
 - d. October- December []

26. Name the Vehicle types that are involved in the accident

- a. Car/taxi [] Make ----- Model
- b. Bus [] Make ----- Model
- c. Lorry [] Make ----- Model
- e. Trailer /Tanker [] Make ----- Model
- f. Motor/tricycle [] Make ----- Model
- g. Bicycle [] Make ----- Model
- h. others specify

27. What will you say is the cause(s) of the accident?:

Human Related Cause

- a. Drivers Recklessness & dangerous driving []
 - b. Driver Stress and Fatigue []
 - c. disregard of road traffic rules and regulations []
 - d. negligence of pedestrian and other road users []
 - e. Over speeding []
-]
- f. wrongful overtaking []
 - g. avoiding of obstruction or animals []
 - h. under the effect of alcohol and drugs []
 - i. flashing and dazzling of headlights []
 - j. other specify

Vehicle Related Causes

- a. Tyre burst/pull- out []
- b. Steering wheel lock []
- c. defective lights/ signals []
- d. Break Failure []
- e. Others specify

Environment Related causes

- a. Bad Roads (Potholes) []
- b. Absence of Road Traffic Signs []
- c. Bad Weather []
- d. Poor visibility (fog) []
- e. Heavy rainfall []
- f. Others specify

28. Make suggestion(s) as to how the occurrence of accident on this highway can be reduced?

- a. Redesign and Expansion of the road []
- b. Regular patrol by the law enforcement agents []
- c. involvement of stakeholders (commuters, NURTW, Marshals) []
- d. drivers training and attitudinal re-orientation []
- e. Strict implementation of vehicles roadworthiness and inspection []
- f. Others specify