TRAFFIC LAW AND THE IMPLICATION OF TRAFFIC CONGESTION AT SABON GARI MARKET, KANO STATE

BY

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BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF SOCIOLOGY, FACULTY OF SOCIAL AND MANAGEMENT SCIENCES, BAYERO UNIVERSITY, KANO

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DECLARATION

This is to certify that this project was carried out by me under the supervision of Dr. Haruna M. Awaisu of the Department of Sociology, Bayero University, Kano. The material content of this project is, to the best of my knowledge original. It has not been presented anywhere for any award of a certificate. All sources of information have been duly acknowledged by means of references.

Yusuf Garba

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Sign and Date

CERTIFICATION

This is to certify that this project titled "*Traffic Law and the Implication of Traffic Congestion at Sabon Gari Market, Kano"* was an original work conducted by Yusuf Garba **SPS/11/MCM/00016.** It has been read and certified to have met the conditions and regulations governing the award of Master of Crime Management, Prevention and Control, Bayero University, Kano and is hereby approved for its contribution to knowledge and literary presentation.

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DEDICATION

This project is dedicated to my parents and my lovely wife for the inspiration and encouragement I have been receiving from them at all times.

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I want to start by thanking Almighty Allah, the compassionate, and most merciful for giving me the protection, wisdom and strength during the time of the study.

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My most appreciation goes my dear mother.

ABSTRACT

The study is to examine the impact of traffic law and the implication on traffic congestion at Sabon Gari, Market Kano State. The objectives of the study was to investigate on a nation-wide basis, the causes of traffic congestion in major cities of Nigeria and to determine the possible cause of traffic congestion around Sabon Gari Market. The primary and secondary source of data collection was used in the study. Questionnaires were administered to the respondents to seek their opinion on the subject matter. The data gathered were analysed, and the findings revealed that the productivity is reducing as a result of lost of time in traffic congestion, it was also discovered that unnecessary parking by the road side reduces the size of the road and thereby leads to congestion. Also, Traffic congestion affects the movement of people and the flow of goods to the market. It was recommended that environmental and traffic laws (regulation) need to be reviewed so as to minimize the problems of environmental pollution and traffic congestion. Also, the There should be adequate public awareness on the traffic congestion so that the road user will be able to adhere to the rules and regulations and safety can be improved by reducing the chances of a driver making an error or by designing vehicles to reduce the severity of crashes that do occur.

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CHAPTER ONE
INTRODUCTION

1.1 Background of the study

According to the Joint Transport Research Centre of the Organisation for Economic Cooperation and Development (OECD) and the European Conference of Ministers of Transport (ECMT), "Cities and traffic have developed hand-in-hand since the earliest large human settlements. The same forces that draw inhabitants to congregate in large urban areas also lead to sometimes intolerable levels of traffic congestion on urban streets and thoroughfares."(ECMT 2007:5). This captures the relationship between urban cities and traffic congestion as well as the world wide dimension of the problem of traffic congestion in urban cities.

Many urban cities in Nigeria are bedevilled with traffic congestion which tends to defy various remedial measures adopted by different governments over the years. Journey times from one point to another within a town have remained unreliable and residents have continued to face disturbing inconveniences in transportation. These are accompanied by noise and air pollution and the high costs associated with burning of fuels from stationary vehicles.

The contributions of road transportation to environmental degradation in urban cities of Nigeria have been highlighted by Arosanyin (2008). The

problem is no longer limited to traditional cities such as Lagos, Ibadan, Benin-City, Port Harcourt, Abuja, Kano, and Kaduna (Arosanyin 2007). Virtually every state capital city in Nigeria today faces the problem of traffic congestion (Evans 1991). For example, Calabar city which was not previously associated with traffic congestion is now facing considerable traffic congestion on many of its urban roads, particularly when the schools are in session.

Although many researchers have conducted studies on traffic congestion and delays in Nigeria, most of these studies concentrate on specific cities such as Kano (eg. Aworemi et al 2009; Bashiru & Waziri 2008) etc. All these fall under only the south-western part of Nigeria with different cultural practices and behaviours compared with other geo-political regions of the country. Also, a review of previous research shows that the views of expert transportation engineers have not been considered.

Like many other institutions, markets lack sanitary facilities and services necessary to maintain the standard hygiene of the environment. This increases the chances of serious health problems to peoples who leave within the vicinity. Airbor and Olorunda (2006) stated that market occupy an important position in the lives of Nigerians market usually attract pro-school children. The coming together of buyers and sellers in the market provide

opportunities for the spread of communicable disease with considerable potential to reach epidemic dimensions.

Activities involved in buying and selling generate large quantities of solid waste. It is quite common to observe mountains of refuse at market places. The heaps of refuse provide excellent breading pounds per vectors of communicable diseases including rodents, insects etc. They may also pose fire hazard apart form being eye sores and sources of unpleasant odour. Very frequently refuse has encroached on or completely blocked roads thereby obstructing traffic Refuse often block gutters and other channels thereby aggravating flooding during rain session.

Another common feature of markets in Nigeria is gross inadequacy of sanitary facilities including potable water, toilet and bathrooms, refuse disposal bays etc. Open urination and defecation is widespread and the resultant contamination of the environment contribution to environmental degradation. Furthermore, poor supervision of market by ill-trained, ill equipped and corrupt official have led to overcrowding, trading on access roads within and outside the market – all adding to dangers that traders face. Blockage of access roads within the market and in the market surroundings

sometimes lead to unnecessary loss of lives and properties at the event of emergencies such as fire accident.

Traffic congestion occurs when cities road network is unable to accommodate the volume of traffic that uses it. This situation is caused by rapid growth in motorization and with less than corresponding improvement in road network, traffic management techniques and related transport facilities. This road traffic congestion is a phenomenon that is associated with urban environment all over the world. This is because we need transport to move from one place to another, especially when trekking becomes inefficient. While traffic congestion has been managed very well in some developed countries, it has continued to defy solutions in developing world especially in Metropolitan cities like Lagos, Port Harcourt, Kano in Nigeria urban centers in Nigeria suffer from inadequate facilities that could ensure smooth urban movement.

Congestion and its side effects are serious concerns for urban transport systems. Due to the limitations that increasing scarcity of land and increasing emphasis on environmental stewardship place on new road construction, alternative approaches involving the application of advanced traffic control systems under the umbrella of Intelligent Transportation

Systems (ITS) have become increasingly important. These advanced systems will be vital to the process of improving urban transportation operations and hence relieving the negative impacts of congestion.

Traffic control systems can be static or real time. Compared with the static systems that have no means to respond to current traffic conditions, real time traffic control systems respond to evolving traffic conditions by processing automatically sensed traffic stream characteristics. Real time systems can in turn be either traffic responsive or proactive. Traffic responsive systems adapt to the currently detected traffic conditions. However, accurate short term traffic condition prediction can theoretically enable traffic control to be in place precisely when needed. The potential and expectation for short term traffic condition forecasting to impart this anticipatory ability to the real time traffic control systems has been around since the 1970s. Towards this end, numerous short term traffic condition forecasting algorithms have been developed. Unfortunately, little success has been reported in implementation of such a proactive traffic control system, and consequently, integration of short term traffic condition forecasting algorithms with the real time traffic control systems continues to be a well-motivated applied research area.

Markets within the Kano city are not exceptional in matters relating to pollution and traffic congestion, the cleanliness of the market present one of

the most difficult public health problems. To neglect or give little attention to this condition, means the lives of people will be exposed to danger. Therefore, a conscious effort should be made to improve and maintain an adequate standard of hygiene. It is the intention of this study to focus primarily on the impact of traffic law and the implication of traffic congestion at Sabon Gari Market Kano.

1.2 Statement of the Problem

Ideally, markets are supposed to be kept clean. Man is supposed to enjoy sound health. The government has it as responsibility to provide an environment which is free form disease causing agents. Endemic diseases fire accidents and other traffic accidents are caused due to environmental pollution and traffic congestion and they are preventable when good hygiene precautions are adhered to.

Unfortunately, the reverse is the case, markets are not kept clean, and thus it serves as a place where pollutants are proliferation mostly because of poor environmental hygiene. There are no enough water ways to carry away waste to central collecting pit hence becoming nuisance and even polluting other water sources. Access road within the market were often congested with improper refuse disposal, unauthorized trading on access roads and

overcrowding thereby obstructing the traffic and sometimes leads to unnecessary loss of lives and properties.

Many urban cities in Nigeria are bedevilled with traffic congestion which tends to defy various remedial measures adopted by different governments over the years. Journey times from one point to another within a town have remained unreliable and residents have continued to face disturbing inconveniences in transportation. These are accompanied by noise and air pollution and the high costs associated with burning of fuels from stationary vehicles.

The contributions of road transportation to environmental degradation in urban cities of Nigeria have been highlighted by Onokala (2008). The problem is no longer limited to traditional cities such as Lagos, Ibadan, Benin-City, Port Harcourt, Abuja, and Kano state in particular. Virtually every state capital city in Nigeria today faces the problem of traffic congestion (Moses 2011). For example, Calabar city which was not previously associated with traffic congestion is now facing considerable traffic congestion on many of its urban roads, particularly when the schools are in session.

1.3 Objectives of the study

The objective of this study is to examine the impact of traffic law and the implication on traffic congestion at Sabon Gari, Market Kano State. Specifically, the study sought:

1. To investigate on a nation-wide basis, the causes of traffic congestion in major cities of Nigeria.
2. To determine the possible cause of traffic congestion around Sabon Gari Market.
3. To find out the possible cause of traffic congestion around Sabon Gari Market.
4. To identify the effect of traffic control in Sabon Gari Market.

1.4 Research Questions

1. What are the causes of traffic congestion in major cities of Nigeria?
2. What is the incident rate of road traffic accidents around Sabon Gari Market?
3. What are the causes of traffic congestion?
4. What is the effect of traffic control in Sabon Gari Market?
5. What is the effect of traffic law in Sabon Gari Market, Kano State?

1.5 Significance of the Study

In Nigeria, traffic congestion has remained part of the operating transportation system especially during the morning and evening, afternoon and evening peak periods which grossly affects distribution and movements at Sabon Gari, Kano.

It is hoped that the Kano State Government will use the findings of this study to imbibe effective techniques and proper sanitary condition of the Sabon Gari Market. Similarly, it is excepted that the national health planners and policy marker will use the findings to design strategies for the improvement of sanitary procedures for combating pollution related disease and traffic related accidents in this part of the country.

Lastly, the populace will be enlightened on dangers associated with pollution and traffic congestion which may help them to adjust their activities for the improvement of their health standard.

The findings from this study can provide independent information to guide the Federal and State governments, including concerned private companies and international agencies in responding to the challenges of traffic congestion in Nigeria. Besides, it will also trigger further studies in attempt to find solutions to the issues raised by this study.

Lastly the study will serves as a reference point for students and other scholars that may be willing to further study on the subject matter.

1.6 Scope of the Study

The study is to examine the impact of traffic law and its implication on traffic congestion. The study will cover the period of 5 years i.e. 2007 - 20012. The study will not cover all the state and as such it will be limited to Sabon Gari Market Kano. The study will also examine the traffic law, the causes of traffic congestion, the implication of traffic congestion and ways to overcome the problems of traffic congestion.

1.7 Limitation of Study

It is expected that this study may experience the following limitations.

Firstly, this work will not be able to study all the area in Kano State as such this may in a way limit the scope of this study.

Secondly, it expected that the respondents may not want to divulge certain data required for the study and this may in way reduce the quality of data for the study. However, the researcher will try his best to mitigate these limitations and others unforeseen ones. This will be done by structuring and

designing the instrument for data collection to elicit non sensitive information from them.

1.8 Definition of Terms

Traffic Congestion:- Means the blockage or over crowding of access roads.

Environmental Pollution:- The introduction into the environment (air, water or land) of contaminates of that quality, characteristics and duration of which are likely to be injurious to human, animal or plant life.

Market:- A public place for buying and selling.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter brings together the views, ideas and opinion of different authors and professionals in the field of marketing and innovation in respect of the research topic. The various information in this chapter are therefore collected from secondary sources like recitation, quotations and personal reviews of magazines, journals, seminar papers and textbooks.

2.2 Meaning and Concept of Traffic Congestion

Congestion according to Dingle (2008) means overcrowded condition or too much gathering of people or other things at a particular place. In a situation where a certain place is over populated/overcrowded by people or any other things either due to the dual nature of the place or any other reason may refers to be congested place and this condition may contribute health hazard to human lives. Traffic congestion therefore has to do with too much gathering of people and other things around the road network. This condition contribute immensely hazard to human health as a result of road traffic accidents, air pollution and fire accidents which may lead to loss of lives and properties and many other air born infections.

Traffic congestion has been identified as being able to account for incremental cost resulting from interference among road users (TDM Encyclopedia, 2004). These effects are mostly significant under urban-peak conditions when traffic volumes approach a road capacity. Road traffic congestion is a significant and growing problem in many part of the world. Moreover congestion continues to increase despite, the conventional approach of building new road because of variety of reasons-political financial and environmental reasons. In fact, building new roads can actually compound congestion. In some cases, by including greater demands for vehicle travel that quickly eats up the additional capacity (Sheldon and Wayne, 1995) propensity travel is higher because owner of vehicles make more convenient journeys.

It is even more domineering in traditional Nigeria cities and towns where planning is not adequate. The traditional hinter land in such cities of Lagos Ibadan, Port-Hacourt, Kano Kaduna and Abuja etc. experienced this problem because their organic structure does no encourage effective urban traffic movement. Traffic congestion has become a severe scourge in large cities in both the industrialization and developing countries (Bulleting FAL, 2001), Nigeria inclusive and Metropolitan Kano in particular is not left out, increasing demand for urban transport and transit has led to longer travel

times and greater incidence of accidents, environmental problems and deterioration of quality of life than is considered for citizens.

Congestion has also been observed to decrease productivity through lost time and causes stress and put additional wear on our vehicles, all of which have a negative impact on our pocket books (TMG, 2003). Congestion reduces mobility and increases driver stress, vehicle costs and pollution, hence, the need to device means of controlling congestion. Urban settlements in the development settlement are better planned than what obtains in developing ones. Yet reports of incidences of traffic congestion abound on daily basis. Then it is obvious that likely worse situation may occur in the unplanned cities of Africa. Congestion arises out of the conjunction of two factors. The first is that every process has a finite capacity. The second is that every process has a stochastic character; there is some degree of randomness in both the demands placed on a process to service those demands (Marvia, 1995). Whenever the total impute rate is greater than the output link capacity, congestion occurs. When due network becomes congested. The queue lengths may become very large in a short time resulting in buffer, over flaws and cell loss congestion control is therefore necessary to ensure that users get the negotiated Quality of Service (QS) (ATM,2005).

It has been argued that there is no single widely accepted definition of traffic congestion. The reason for this is associated with operational and user perspectives. The Joint Transport Research Centre (2007) of the Organisation for Economic Cooperation and Development (OECD) and the European Conference of Ministers of Transport (ECMT) provide the following definitions of traffic congestion to reflect the different broad perspectives:

i. "Congestion is a situation in which demand for road space exceeds supply.
ii. Congestion is the impedance vehicles impose on each other, due to the speed-flow relationship, in conditions where the use of a transport system approaches capacity.
iii. Congestion is essentially a relative phenomenon that is linked to the difference between the roadway system performance that users expect and how the system actually performs."

Just as the definitions of traffic congestion are broad so are the causes. There are many causes of traffic congestion and these differ from place to place. The study attempts to investigate the main causes of traffic congestion associated with Nigerian urban cities with a view to suggesting solutions to help governments and policy makers towards better cost and effective

management of this problem. Traffic congestion is sometimes the result of urban development, housing, employment and cultural policies which cause people to live and work relative to one another in close proximity (ECMT, 2007). Ogunsanya (2002) argues that traffic congestion is a major transportation problem of Nigerian cities. At international level, it has been argued that "dynamic, affordable, liveable and attractive urban regions will never be free of congestion" (ECMT 2007:7).

A number of studies have been conducted in Nigeria and elsewhere concerning traffic congestion and its causes. Ogunbodede (n.d.) studied traffic congestion in Akure Nigeria using GIS approach. It was argue that traffic congestion is as a result of the increasing growth in motor vehicles without a corresponding improvement in transport facilities such as road network, traffic management techniques. The study also highlighted illegal roadside parking and lack of geospatial information necessary to tackle the spatial problem as other causes of traffic congestion. The study further suggested the use of a dynamic Traffic Information System (TIS) structure to monitor congestions in Akure city. This will also alert or inform road users about congested routes through linkage with Federal and State Radios. It cautioned however that this should not be used in isolation but to complement traditional methods of traffic management such as construction

of new routes, flyovers, one-way, odd and even numbers, etc which have earlier failed on their own to solve congestion problems in cities such as Lagos, Kano, Port-Harcourt, Benin-City, etc. The limitation in the TIS approach lies in the possibility of some road users not tuning to radios, or the radio stations not devoting the entire airtime to traffic information.

However, with the level of technology available today, the use of Variable Messaging Signs (VMS) located at strategic points on the road may provide a suitable alternative to the TIS. Also, the problems of intra-urban traffic in Lagos Nigeria have been studied by Bashiru and Waziri (2008). The study found that 57% of commuters and motorists spend between 30 to 60 minutes on the road due to traffic congestion. They also found that the worst traffic congestion occurred on Mondays. This agrees with similar findings by Agbonika (2011) for Abuja City. Bashiru and Waziri (2008) listed the causes of traffic congestion in Lagos to include the following: Presence of pot holes/bad road, trading activities, street parking, loading and discharging of passengers, illegal bus stops, flooding/poor drainage, vehicle breakdown, narrow road sections, religious activities, high volume of traffic, lack of parking space and lack of traffic light at some road intersections.

Similarly, Assum (1998) studied traffic congestion in Kano Metropolis. In agreement with Robinson & Smiley (2008), the study noted the following major causes of traffic congestion. These include: poor road condition, inadequate road infrastructure, accident, inadequate traffic planning, drivers' behaviour and lack of integrated transport system.

The problem of traffic congestion at road intersections in Ilorin Nigeria has been examined by Aderamo and Atomode (2011). Road intersections form a major component of urban roads and are generally prone to traffic congestion. The study found that traffic wardens and parking problems are the greatest causes of traffic congestion/delays at road intersections in Ilorin.

Their study highlights the fundamental theory of traffic flow to underscore the importance of traffic flow characteristics such as flow, density and velocity to the planning, design and operation of urban roads. This is in line with Salter and Hounsell (1996). In a study by Agbonika (2011) in Abuja Nigeria it was found that only 18.57% of the sampled commuting population lived within the city centre. This indicates that the location of major government offices with respect to the spread of residential areas, where this is not properly considered in town planning and development of master

plans for major urban cities, can cause serious congestion problem due to mass movement within the same period as in the case of civil servants moving to and from work around the same period of time. This is confirmed by the study as the worst congestions in Abuja occur in the morning (8.00 am) and evening (6.00pm) respectively.

2.3 Types of Congestion

Many types of congestion occur in transportation system but it is especially important to distinguish two major categories (Marvin, 1999)

i. Load-independent congestion

ii. Load –dependent congestion

Load-Independent Congestion:

This occurs when system performance is degraded by the interactions of system components, even if the system is not utilized (Marvin, 1979). For example, vehicles moving along guide way can experience congestion even if there are no passengers or cargo on the vehicles. In this case the demand that causes congestion is that of the system component such as vehicles rather than passengers or cargo. There are number of specific types of congestion in this category, two of which are vehicle facility congestion and vehicle-schedule congestion.

Vehicle-facility congestion: Every facility, whether guide way or terminal exhibits congestion effects. A terminal has a service rate at which it can handle arriving or departing vehicles. A guide way has a service rate at which vehicles move over facility. The mechanism controlling congestion on guide ways is the head spacing-speed distribution. As the volume of vehicles scheduled or otherwise. Attempting to move through a guide way approaches capacity, vehicle interactions cause speed reductions and thus, delays (congestion) in this case actual frequency (flow rate) of vehicles, where þ = 9, the flow capacity of the facility. Vehicle –facility congestion can occur whether the vehicles are empty or full; the demand is not load but vehicles. This is mostly prevalent in Metropolitan Kano where the performance on most of the roads is a function of vehicle, intersection, alignment (horizontal and vertical) etc.

Vehicle-Schedule Congestion: This type or congestion arises when the number of scheduled trips is large relatively to the number that can be produced by the available fleet. Here, the services rate is a function of the volume of round trips per vehicle per time period. The demand is the number of round trips required to meet the schedule.,Q^ = Where Q is the scheduled frequency

Load-Dependent Congestion:

This occurs when systems performance is degraded by the volume of flow of load (passenger or cargo). If the flow volume of passengers or cargo is Zero, no degradation occurs, two are listed below (Marvin,1999)

Load-Vehicle Congestion: This arises when a stream of vehicles move over a route past a terminal at which loads is waiting to board. The waiting time experienced by a passenger (or cargo load at the terminal has two components; waiting time until the first vehicle arrives (after arrival of the passenger at the terminal) and the additional time (if any) until a vehicle with an empty space arrives. In this case, if q is the frequency at which vehicles move past the terminal and each vehicles move past the terminal and each vehicle has a payload capacity w, then the number of seats or (tons) available per unit of time is wq and the service rate is þÞ=Wq (1)(Marvin Model)Marvin (1999) suggested that he model is crude, a more realistic one would model the arrival of batches of seat size w at rate q. The arrival is the number of passengers (or tons) at the terminal ready to board (per unit time). That is delay time reflects the probability of finding a eat. In this case of a grains slipper waiting for an empty tracker to be available to in or loading by rail carrier for the available vehicle capacity.

Load-Schedule Congestion: A key element of a schedule is the time allowed, for each detailed element of vehicle's movement. For examples, the time allowed for loading unloading cargo or passenger at each step. Congestion occurs when the terminal volumes to be loaded requires more time originally scheduled. In this case, the service rate is the quantity of passengers or cargo that can be loaded per unit time and the arrival rate is actual volume requiring loading.

Indiscriminate parking of vehicles along roadsides also results in congestion as it reduces the road width. Aluko (2004) in his study that the cause of delay in Metropolis include passenger services (commercial vehicles), intersection, inadequacies, bad road, pedestrian interference and religious activities such as first weekends of every months by the Redeem Church of Christ along Ibadan-Lagos express. Extension of Jumat services along road sides by some Mosques on Fridays and blocking some major roads during traditional festivals can obstruct flow movement which can also lead to congestion.

Non recurring congestion:

This is the delay attributed to temporary disruptions of the transportation system by spontaneous unplanned occurrences like traffic accidents and

incidents, research zones, poor weather, emergency maintenance and special events (Sheldon and Wayne, 1995; Jeff, 2004) As reported by USDT-FHA(2005) These external events can have a major effect on traffic flow. When these events occur, their main impact is to steal physical capacity from the roadway. Events also may cause changes in traffic demand by causing travelers to rethink their trips. This type of congestion occurs in a typical unplanned urban city like Kano.

2.4 Cause of Traffic Congestion

Federal Road Safety Commission (2008) revealed that it is a very common phenomenon in Sabon Gari area to find a traders taking over a large portion of road to keep his goods for sale. This market people contribute a lot in creating congestion of road traffic in Sabon Gari area. Consequently, attracting road traffic accident in Sabon Gari.

Albor and Olorunda (2006) stated that poor supervision of market by ill-trained, ill-equipped and corrupt officials have led to overcrowding, trading on access roads with and outside the market all adding to danger that traders face. Saminu (2008) opined that traffic congestion may sometimes depend on the dual nature of the area. In some areas traffic congestion may be constituted by high pollution level, high commercial activities and poor

condition of the roads. Security problems and disobedience to traffic rules may also contribute to traffic problems.

In matter relating to the causes of pollution Obionu (1999) asserted the Air pollution is caused by various activities of man. The sources of atmospheric pollution include:-

a. Combustion
b. Specific industrial process
c. Personal habit e.g. smoking
d. Nature.

According to the Getso (2006) the causes of air pollution can be categorically grouped into 3 namely, natural, household and industrial sources.

2.5 Effects/Cost of Congestion

Congestion affects the research trip and the personal trips. It affects the movement of people and the flow of goods to the market. To the travelers including truckers (both long haul and local pickup and delivery) household and business service providers such as Logisticians, site managers, information network analysts, computer technicians, police and ambulances services) and personal travel (such as commuters, vacationers and shoppers.

Congestion means lost of time, missed opportunities, frustration and wasting of personal resources.

To the employers, congestion means lost of worker opportunity, delivery delays and increased costs. Speed reliability and the cost of urban and intercity freight movements are increasingly affected by congestion (Sheldon and Wayne, 1995, USDT-FHA), 2005. The congestion costs to freight interests are significant. Congestion is growing on many key freight segments of the transportation system and congestion can drastically reduce productivity of the overall freight network. The delay caused by congestion could vastly increase costs of those freight movements that are today managed to exacting schedule (USDT-FHA, 2005).Congestion causes more fuel to be used and more emissions to be produced. The extra time spent in congestion causes services provider's to make fewer calls per day, leading to higher prices for consumers, this is particularly important for emergency medical, fire and police services which may be unnecessarily delayed from attending to medical, crime and disaster situations. (USDT-FHA, 2005). Companies with production schedules timed to take the advantage of trucks delivery components to an assembly line as they are needed must instead plan for items to arrive early. The primary objective of the principle of JUST-IN-TIME (JIT) can not be achieved in production system as

congestion will always leads to poor inventory. For trucking as congestion spreads into the midday period, which is the peak travel periods reliability- for trucks, the ability to hit delivery windows predictably will decrease and will decrease and will add even costs as firms struggle to optimize delivery schedule. This is especially a problem for trucks who must meet Just-in-time delivery schedule set by shippers, manufacturers and retailers.

2.6 Measuring Congestion

Traffic congestion is considered as one of the main urban transportation problems (In this case, urban includes suburbs, and even small resort communities during tourist season or other major events (TDM, Encyclopedia, 2004)

Congestion can be measured in various ways including roadway level of service (LOS), Average traffic speed and Average congestion Delay compared with free flowing traffic (Todd, 2004) Various indices are used to quantify, monetize (measure in monetary units and valuate congestion). The key principles that the Federal Highway Administration (FHWA) has promote that the metrics used to track congestion should be based on travel time experienced by the users of the highway system. While transportation profession has used many other types of metrics to measure congestion,

travel time is a more measure of how congestion affects users (USDT-FHA, 2005). Travel time is understood by a wide variety of audiences- both technical and non-technical as a way to describe the performance of the highway system. Travel time reliability is a growing problem as the variation in travel time from day to day is a significant characteristics of the congestion problem. In a typical unplanned metropolitan city like Kano, congestion can be measured using travel time, which is the time required by vehicles to traverse measured course, because the equipment required are readily available. The features that hamper/hinder the free flow of traffic.

The measures may be applied to all cars in turn over the course of the week, in accordance with final digit of the number plate. In addition, truck and other cargo laden vehicles would normally be banned from circulating in the central city at peak periods. Buses should be exempted, since they create least congestion per passenger transported and represent an important alternative for people forced to keep their own car at home. Restriction could be via surcharge on the annual motor vehicle license. This will be effective, if those that will keep their vehicles at home can make their trips conveniently and comfortably.

Access Management: This is a term used by transportation professionals for coordination between roadway design and land use to improve transportation. It involves changing land use planning and roadways and intersections on arterials and high ways, constructing medians to control turning movements, encouraging clustered development and creating more pedestrian oriented street designs. This reduces friction along the roadway, which tends to increase traffic spreads, reduce congestion delays and reduce crashes.

Speed Reductions: Reducing traffic speed to 55mph or less in congested roads can often increase traffic flow and reduce conflicts and driver's stress. This may be achieved by reducing posted speed units, improving enforcement of existing limits, or implementing road design features that discourage excessive speeds.

Traffic Calming and Roundabouts: Traffic calming induces a variety of roadway design features that reduce vehicle travel speeds and volumes. Traffic calming results in smoother traffic, more optimal speeds and causing modern roundabouts are alternatives to stop signs an traffic signals at small and medium size intersections that can reduce stopping requirement and avoid traffic platoons.

Supply Initiatives: The supply of transport services consist of a range of means of providing transit which can be categorized as follows; urban road infrastructure or network; means of transport or vehicles; and the way in which both are managed. Improving any component of supply normally increases passengers-bearing capacity and reduces congestion. A numbers of solutions are outlined below reflect this principle.

The Urban Road Network: Infrastructure is comprised of avenues, streets and intersections. In unplanned cities, the road system is often poorly designed and maintained and this state of affairs would need to be improved before extension to reduce congestion that could be envisaged. Substandard design or condition of the road system causes congestion. Instances abound of unmarked traffic lanes, bus stops located next to intersections and other shortcomings that hamper the flow of traffic and comprises security. The poor condition of road surfaces and in particular potholes, restricts the capacity of the roads.

Habitality should combine the case of movement and one way to do this is to assign special functions to different streets; some may be designed and used for long journeys and high volumes, others for local service and accessibility, with the remainder performing mixed roles. Besides, large

investments in wider road typically fail to deliver the expected results, as new motorists join the traffic volumes, a phenomenon evident in cities where motorway networks have been built.

Intersections: Crossroads can lead to substantial, improvements in traffic flows. As a general rule, road capacity is determined by intersections. Since they are where two or more roads meat, they must allow vehicle flows that cross each other's path to continue their journey. It is important to design intersection with care, since they are normally where bottle necks occur. The paths to be taken should be clear, as should waiting areas for vehicles continuing on or turning. Similarly needs for pedestrians must be catered for. Intersection may be unsignalized (only where there are lower traffic volumes) features right of way sign (with priority determined by give, a way and stop, signs) or operate with traffic lights. The choice of control system depends on the range of factors, such as traffic volumes, visibility, hold-ups or accidents.

Condition of traffic lights: Traffic lights are appropriate at many intersections. Where many lights are located at close intervals, coordination is one of the most effective means of increasing the speed of traffic flows and achieving saving in term of travel times, fuel, pollution and accidents.

Coordination involves establishing cycles, allocating times and providing phases in a road or network in such a way that vehicles can travel at a specified speed, thereby keeping the disruption caused red lights to minimum. Some ways of coordinating traffic lights are; coordinating using fixed, that is pre-et, plans, which can be changed manually.

Though the approach is not obsolete, the results achievable are limited in scope. Centralized flexible coordination, which allows for phasing changes as and when required; the system is administered from a central computer and is responsive to changes in actual volume at each intersection. In this way, it is possible to make very fine adjustments in areas of high traffic density. Combined system such as providing flow dynamic control in city centre, fixed plans in some remote arterials and even autonomous in functional terms.

Giving Priority To Public Transport: One practical method of increasing passenger-bearing capacity is to place greater reliance on vehicles that transport more passenger than car. This means fewer vehicles on the road, leading to more efficient use of scare respect (Bulletin FAL,2001). Giving priority to public transport is justified on two counts; first, public transported and secondly, it is a regulatory step that corrects the distortion resulting from

private motor vehicles not paying for the cost of congestion they cause. Apart from granting buses certain advantages in phasing traffic lights, the main preference is to serve lanes solely for their use. That enables buses o speed up, while eliminating frictions with other vehicles, which in certain circumstances step up their speed, as has been borne out on quite a few occasions.

Some other Traffic Management techniques includes;

i. Bus only lane

ii. Segregated bus lane

iii. Exclusive bus road ways

iv. Varied direction roads

v. Parking guidance and information

vi. School opening times arranged to avoid rush hour traffic

vii. Speed limit reduction.

2.7 Concept of Road Safety

Road Safety is the concept that deals with state of security and certainty of roads by the road users. The aim of road safety is to reduce the harm cause by motor vehicle collisions. Unsafe roads can cause deaths, injuries and property damage, the consequences of road accident is always great. Road

traffic crashes are one of the world's largest public health and injury problems that are preventable. According to the World Health Organization more than a million people are killed on the world's roads each year. Road safety becomes a major public health concern when the statistics show that more than 3,000 people around the world succumb to death daily due to road traffic injury.

In addition, road crashes lead to the global economic losses. An estimate in road traffic injury costs an economic burden for developing countries. It is reflected that the road crash costs up to USS 100 billion in developing countries which is twice the annual amount of developing aid to such countries.

The collection and use of accurate and comprehensive data related to road accidents is very important to road safety management. The road safety data are necessary not only for statistical analysis in setting priority targets but also for in depth study in identifying the contributory factors for better understanding of the chain of events. Having the inconsistence in the aims of the police and the road safety engineers, the data analysis and its interpretation usually does not result in proper counter measures.

Sometimes lack of proper knowledge of crash and proper training of the police officers in charge of systematic data collection procedures from a crash scene adds to the diverging nature of the role of the police and the road safety professionals. These problems have become a burning issue for developing countries addressing road safety without completed crash data due to the negligence of the concerned authorities. A traditional approach to road safety tends to focus on vehicles and victims. Solutions purposed for changing the safety of vehicles and those who become the victims of road accidents include designing roads to be safer reducing speeds, requiring wearing of helmets and seatbelts and implementing licensing or driver training. However road safety remains an enormous problem which grows as the number of motorized vehicle on the road grows. It has become increasingly recognized as a public health issue but a lack of road safety is less acknowledged to be a social issue with social cultural and political causes and effects in fact a lack of road safety has enormous social implications and it also has a number of social causes.

The range of social impacts caused by a lack of road safety include

1. Pressure on caregivers and families of accident victims.
2. An increased number of people with long term disabilities caused by road accidents.

3. Increased isolation for those who fear for their safety and security.
4. Local footpaths animals trails and other non – motorize routes are often endangered by the encroachment of a road or road traffic.
5. Sidewalks and pedestrian spaces, where they are available, are often encroached upon by motor vehicles making pedestrians on their own space or forced to walk on the street.
6. Safety may be used as an excuse for banning the movement of heavy duties truck in the morning in part of the towns for example in Lagos the heavy trucks are not allow in the morning.

2.7.1 Social Causes of Poor Road Safety

1. Cultural and political attitudes that put motorized transport rather than people and communities at the heart of transport policies and behaviour
2. Long term knowledge on the full range of impacts of road (including the negative impacts) is rarely studied or documented
3. Traffic and transport systems are made for cars not for the needs of vulnerable road users
4. Poor management and enforcement allows people to get away with unsafe driving.

2.7.2 Policies and Actions for Road Safety

1. Create access to knowledge on how a broad range of social issues must be considered as part of improving road safety for everyone and knowledge of experience of what has worked elsewhere.
2. Carry out broader social assessments as part of road safety audits.
3. Work towards mainstreaming universal design principles so transport is safe and accessible for those with impaired mobility.
4. The National Road Transport Union and other Transport Union must be part of the decision making process.
5. Greater numbers of people using a certain type of transport tends to increase the safety of those people. For example, the numbers of people using motor legless Okada have increased tremendously hence the need for safety measures for this group.

The issue of safety in any condition means the state of being safe and protected from danger or harm. Man's actions and/or inactions, most times, are fraught with consequences that negate the essence of life. About 80% of injuries or death brought to man is attributable to some forms of unsafe act(s) or unsafe condition(s), so also is damage to property and the environment. Inherent degree, caused by man as a result of his inventions

and his activities within the environment where he operates and even beyond. (Ibekwe 2008).

According to Ibekwe (2008), Road transport is one of the major areas in all of man's activities where hazards exist so much that, on a "per second" count, nationwide, damage injury is sustained, harm is done to the environment (through air pollution from smoke and noise) and death occurs in the most cases. In order that this phenomenon can be reduced to as low as reasonably practicable hence road safety is concerned.

Road safety deals with problems associated with road traffic cause by all class of persons including pedestrians, cyclists, and drivers etc. It also tries to provide solutions through the prescription and enforcement of safety operating procedures for the average user of the road.

Road safety is defined as a condition of being safe while on the road, that is, freedom from danger, harm or risk while on the road standing, working, walking or running, riding, driving including being ridden or driven be it on a horse – back motor – bike or in a motor vehicle etc.

2.7.3 **Intervention Policy for Road Safety**

1. Neighborhood roads where many vulnerable road users such as pedestrians and bicycles can be found, traffic calming can be a tool for road safety.
2. Government policy can aid road safety for example, Lagos state government applied odd and eve principle of road management.
3. Another method is to post special safety signage on the most dangerous highways.
4. Modern safety barriers are designed to absorb impact energy and minimize the risk to the occupants of cars and by standards.
5. Clearing obstruction on any part of the highways for example removal of dangerous or falling trees,
6. Making the most road signs and pavement marking materials retro – reflective, incorporating small glass sphere or primes to more efficiently reflect light from vehicle headlights back to the driver's eyes.
7. Creating public awareness and education for drivers, motorists and other members of the public generally on the implication of a dearness to rules guarding safety on the road.

8. Enforcement of use of safety belt Helmets, Child rest speed limits for all categories of road uses.
9. Government cooperation with bodies or agencies or groups engaged in road safety activities.
10. Poor road surfaces can lead to safety problems. Adequate maintenance of the road by both state and federal ministry of works and housing.
11. Safety can be improved by reducing the chances of a driver making an error or by designing vehicles to reduce the severity of crashes that do occur. For example crash avoidance equipment such as lights and reflectors
12. The enforcement of blood alcohol content limits.

2.7.4 Some Establishing Functions of Federal Road Safety

i. Recommending works and devices designed to eliminate or minimize accidents on the highways and advising the Federal and State Governments including the Federal Capital Territory Administration and relevant governmental agencies on the localities where such works and devices are required; and

ii. Clearing obstructions on any part of the highway;

iii. Educating drivers, motorist and other members of the public generally on the proper use of the highways;

iv. Clearing obstructions on any part of the highways;

v. Making regulations in pursuance of any of the functions assigned to the Corps by or under this Act;

vi. Regulating the use of motorcycles on the highway;

vii. In the exercise of the functions conferred by this section, members of the Corps shall have power to arrest and prosecute persons reasonable suspected of having committed ant traffic offence including the following offences and serve such persons with court processes or notice of offence sheet.

viii. Obstructing highway with a vehicle or any other object

ix. Failing to obey traffic lights, road signs or pavement or road markings;

x. Contravention of the provision of any order, by-laws, regulations or rules relating to

xi. Unauthorized removal of, or tampering with, road warning sign;

xii. Creating a road hazard without adequate warning signs;

xiii. Arrest any person suspected of committing or having committed an offence under this Act;

xiv. Removed and detain any vehicle which has been parked in a manner that causes an obstruction on a highway and the owner or driver of the vehicle shall pay a such of ₦200.00 (two hundred naira) for every day or part thereof such detention in addition to any other penalty which may have been prescribed under this act;

xv. Tow away and park such impounded vehicle in the premises of the Corps and promptly notify the police of the matter for further investigation;

xvi. Impound any vehicle by which an offence under this Act is reasonably suspected to have been committed; and

xvii. A person suspected of having committed an offence under this act may be prosecuted in any Magistrate's Court in the Federal Capital Territory, Abuja or the State within which the offence is committed.

2.8 Impact of Traffic Congestion

according to Albor and Olorunda (2006) blockage of access roads within the market and in the market surroundings sometimes lead to unnecessary loss of lives and properties in events of emergencies such as fire accidents. Federal Road Safety Commission (2008) stated that road traffic congestion created noise pollution from sound make by the vehicles and motorcycles. On the other creating pollution from exhaust of the vehicles and motorcycles

in the road traffic congestion and situation that may be hazardous to the health of people around and contributor to global warning.

Pertaining the impact of pollution Getso (2006) stated that air pollutants affect health in various degree of severity form minor irritation through serious illness to pre-mature death. He added that nausea and irritation of eye, nose and throats. They can sensitize respiratory tract to asthma and lay fever. Pollutants worse can cause heart and lungs diseases as bronchitis, emplosema and cancer. Some pollutant can damage the cells of the air ways reducing the ability of the lungs to clear foreign bodies as some ionizing radiation can damage many body tissues causing various tissue concern.

Getso (2006) puppet that, the main problem of water pollution is transmission of feaco-oral infect ion and water born diseases, these include typhoid and paratyphoid fever, cholera, dysentery, poliomyelitis, hepatitis, ascariasis, ancydostomiasis, and tangis etc.

Adeyinka (2002) also asserted that the effects of air pollution include the following:-

a. Irritation of eye, nose and throat

b. Cataracts, skin cancer and sunburns.

c. Acid rain

d. Dizziness

e. Fatigue.

2.9 Incidence of Road Traffic Accident

Statistics form the PRS (Policy, Research and Statistics) department of Federal Road Safety Commission (FRSC) RS 1.23 command reveal that about 23% of the total accident cases that were recorded from Sabon Gari in 2007 are motorcycle raiders were the most affected victims of the accident cases, followed by commercial buses. A motorist or rider may struggle to find his way out of the congestion and in the process, the motorist or raider hits another road user.

Another statistic form PRS Department of Federal Road Safety Commission also revealed that total number of accident at Sabon Gari area is 13 in 2007 of which 5 are fatal 6 serious, 2 minor and 14 people were killed.

2.10 Theoretical and Conceptual Underpinning

Urban Car Parking Model

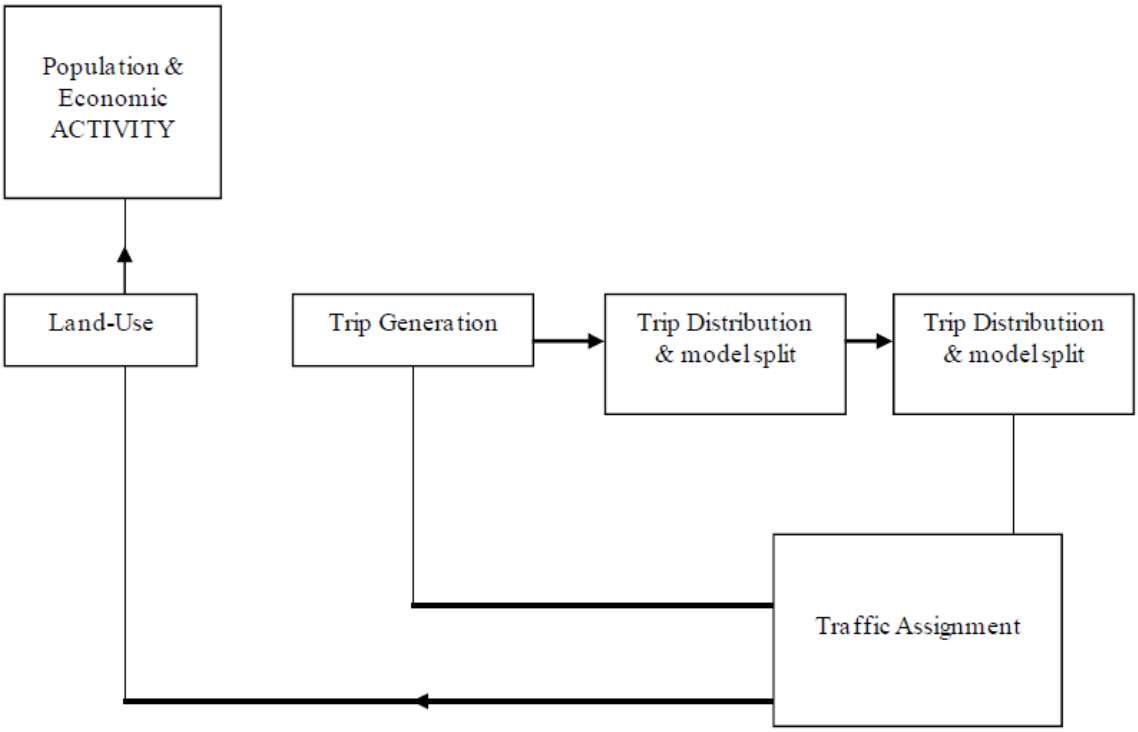
This model is of significance important both at the local and at the strategic level of planning. Parking policy and supply play a major role in traffic management systems in dense urban areas. The amount and the location of parking affect, in particular, the level of service and congestion on access

roads. Parking behaviour is characterized by complex dynamic relationship between multi-dimensional demands, performance and supply quantities. The most commonly used parking models related parking demand to the scale of a single land use (ITE, 1985; TANSW, 1985). The general approach has been extended (Le & Young, 1989) to take into account mixed land uses. The distinguishing features of the models that should be used to investigate parking policy is that they should accurately represent these relationships.

Traffic Assignment Models

This model assigns vehicles to the traffic and parking network given an original destination matrix. Austin (1973) presented two processes for the allocation of parkers to parking stations in the Central Business District (CBD). Firstly using trip generating model to determine the number of trips destined to particular zones in the CBD.

Parkers were then allocated to parking stations depending on the cost of parking and walking distance. The allocation of trips was in proportion to the composition cost associated with each origin and parking lot destination pair. The capacity of the parking system was included by using an interactive procedure.



The Gur-beinborn model was part of a larger system used to analyse the impact of integrated transport systems management strategies in city centers. Included in the procedures were calculations of parking impedance for each parking location in the area, including illegal parking. The model included the amount of time spend looking for a parking space as an increasing function of the utilization level of the parking area. With this relationship, it was possible to describe and analyse the parking process within the framework or user-optimized equilibrium assignment.

In this model parking has been considered as daily system, arrival rate patterns vary throughout the day. Gut and Beimborn described the

application of the model to a high-density section of Haifa, Israel. In the test case the sensitivity of parking behaviour was examined as it varied with the value of walk time, parking cost, parking fines, enforcement policies and level of travel demand.

Traffic Flow Theory

Wattle Worth (1996), there have been many significant development in traffic flow theory. Some of these developments have led to very useful relationship while some application has not been all that useful. He further said that probably, the most useful result of traffic flow theory is the development of the relationship among the macroscopic variables of traffic stream flow (flow rate, speed and density). Traffic Engineering uses the flow theory for the development of the level of services concept.

However, there has been some criticism of the traffic flow theory work regard the lag between the theoretical development and the application of some portion of the flow theory work. The traffic flow theories have largely looked into the basic relationship (why things happen). The traffic Engineers owe them a lot, for these theorists are physicists and mathematicians.

The fundamental characteristics of traffic stream flow are:

a. Flow

b. Speed

c. Density

Wattle Worth (1976) defined rate (q) as the rate at which vehicles pass a point on a roadway. It is expressed in vehicles per how (veh/hr).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the methods which were used to investigate the subject matter. It explains the tools and methods that were used on the investigative activities of the study. First it expresses the methods used in gathering data and secondly narrates the relevant tools and methods that were used in analysing the data.

3.2 Research Design

Survey design was used to describe many decisions of this study. The survey also gave an accurate description of the area of interest providing detailed information's that described the observed trend.

3.3 Population of the Study

The population of the study comprises of all residents of Sabon Gari, Fagge Local Government of Kano State. The population is over 57,568 people dwelling in the area (2006 Census).

3.4 Sample and Sampling Procedure

The sample of this study consist of 100 respondents in Sabon Gari market area it was drawn randomly and a simple random sampling technique was used to select 100 respondents from the area.

3.5 Instrument for Data Collection

The instrument used in this research for the collection of data was 100 questionnaires. The data were collected using fifteen (15) items self-structured questionnaires covered two (2) sections. Section A: was developed to collect data about the demographic information of the respondents. While section B was on the research questions.

3.6 Procedure for Data Collection

The questionnaires were randomly distributed to the respondents through the assistance of primary health care workers of the area. in the process the questionnaire were administered. The respondent were expected to fill in and return the questionnaire immediately where possible. While not possible, respondent were given (2) days within which the questionnaires could be filled and returned. The questionnaires where interpreted to non-literate respondent.

3.7 Method for Data Analysis:

Data collected were analysed using frequency counts and percentage. The result were tabulated and used to answer the research questionnaires.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter contains the findings of the study as obtained through the analysis of the data collected. The result of the findings was analysed in order to assess the validity of the study. The researcher administered questionnaires to members of the public in Sabon Gari Market, Fagge Local Government Area of Kano State. Out of 100 questionnaires administered to members of the public only 80 were filled and returned, and the analysis is based on the returned questionnaires.

4.2 Presentation of Data

4.2.1 Respondents Personal Data

Table 1: Sex

SEX	NO. OF RESPONDENTS	PERCENTAGES (%)
Male	52	65%
Female	28	35%
Total	**80**	**100**

Source: Field Survey, 2013

Table 1 above show that 52 respondents representing 65% are male and 28 respondents representing 35% are female. This means that the majority of the respondent is male.

Table 2: Age

AGE	NO. OF RESPONDENTS	PERCENTAGES (%)
18 – 25	10	12.5%
26 - 35	24	30%
36 – 45	32	40%
46 – and above	14	17.5%
Total	**80**	**100**

Source: Field Survey, 2013

The above Table 2 shows the age of the respondents. 10 respondents representing 12.5% are within the age of 18 – 25 years, 24 representing 30% are within the age of 26 – 35 while 32 respondents representing 40% are 36 – 45 and 14 representing 17.5% are 46 and above. This shows that the majority of the respondents are youth that those that are likely to partake in the subject matter.

Table 3: Marital Status

MARITAL STATUS	NO. OF RESPONDENTS	PERCENTAGES (%)
Married	48	60%
Single	8	10%
Divorced	16	20%
Widowed	8	10%
Total	**80**	**100**

Source: Field Survey, 2013

Table shows that 46 respondents representing 60% are married, 8 of the respondents representing 10% are single and widowed respectively while 16 representing 20% are divorced. This means that the majority of the respondents are the ones that participate in community development that will give their view on the subject matter.

Table 4: Level of Education

EDUCATION	**NO. OF RESPONDENTS**	**PERCENTAGES (%)**
Primary	10	12.5%
Secondary	19	23.75%
Tertiary Education	51	63.75%
Total	**80**	**100**

Source: Field Survey, 2013

Table 4 above shows the level of education of the respondents and it was discovered that 10 respondents representing 12.5% are primary certificate holder, while 19 of the respondents are secondary school certificate holder and 51 respondents representing 63.75 have obtained one certificate or the other in tertiary institution. This gives the researcher the assurance of getting quality data from the respondents as the majority of the respondents are educated.

Table 5: Occupation

OCCUPATION	NO. OF RESPONDENTS	PERCENTAGES (%)
Driver	48	60%
Business	24	30%
Petty Trading	8	10%
Total	**80**	**100**

Source: Field Survey, 2013

Table 5 indicates that 48 respondents representing 60% are drivers and 24 respondents representing 30% are business owners while 10% of the respondents are petty traders. This shows that the majority of the respondents are those who participated in economic development of Fagge Local Government Area of Kano.

SECTION B:

Table 6: Congestion Occur where there is no adequate planning on road network**.**

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	20	25%
Agree	38	47.5%
Undecided	12	15%
Strongly Disagree	10	12.5%
Total	**80**	**100**

Source: Field Survey, 2013

Table 6 above shows that 20 of the respondents representing 25% strongly, 38 respondents representing 47.5% agree and 12 respondents representing 15% and 10 representing 12.5% are undecided and strongly disagree respectively. This means that congestion occur where there is no adequate planning on road network and this mostly occur in Sabon Gari market.

Table 7: Congestion lead to decrease productivity through lost time and causes stress and put additional wear on our vehicles.

RESPONSE	**NO. OF RESPONDENTS**	**PERCENTAGES (%)**
Strongly Agree	40	50%
Agree	28	35%
Undecided	10	12.5%
Strongly Disagree	2	7.5%
Total	**80**	**100**

Source: Field Survey, 2013

Table 7 shows that 40 respondents representing 50% strongly agree that congestion lead to decrease productivity through lost time and causes stress and put additional wear on our vehicles. 28 respondents representing 35% agree while 10 respondents were undecided and 7.5% of the respondents are strongly disagree. This productivity is reducing as a result of lost of time.

Table 8: Indiscriminate parking of vehicles along roadsides also results in congestion as it reduces the road width.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	20	25%
Agree	15	18.75%
Undecided	10	12.5%
Strongly Disagree	25	35.25%
Total	**80**	**100**

Source: Field Survey, 2013

Table 8 shows that 20 respondents representing 25% strongly agree that Indiscriminate parking of vehicles along roadsides also results in congestion as it reduces the road width. 15 respondents representing 18.75% agree while 10 respondents were undecided and 25 respondents representing 35.25% strongly disagree. This indicated that the unnecessary parking by the road side reduces the size of the road and thereby lead to congestion.

Table 9: Market people contribute a lot in creating congestion of road traffic in Sabon Gari, thereby attracting road traffic accident.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	20	25%
Agree	48	60%
Undecided	5	6.25%
Strongly Disagree	7	8.75%
Total	**80**	**100**

Source: Field Survey, 2013

Table 9 shows that 20 respondents representing 25% strongly agree that Market people contribute a lot in creating congestion of road traffic in Sabon Gari, thereby attracting road traffic accident. 48 respondents representing 60% agree while 5 respondents were undecided and 7 respondents representing 8.75% strongly disagree.

Table 10: Traffic congestion affects the movement of people and the flow of goods to the market.

RESPONSE	**NO. OF RESPONDENTS**	**PERCENTAGES (%)**
Strongly Agree	15	18.75%
Agree	50	62.5%
Undecided	5	6.25%
Strongly Disagree	10	12.5%
Total	**80**	**100**

Source: Field Survey, 2013

Table 10 shows the response of the respondents as regards to whether Traffic congestion affects the movement of people and the flow of goods to the market. 15 respondents strongly agree, 50 respondents representing 62.5% agree and 5 respondents representing 6.25% undecided while 10 respondents representing 12.5% strongly disagree.

Table 11: Lack of Proper Resource Management, impacted negatively on the congestion management in Kano metropolis.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	30	37.5%
Agree	35	43.75%
Undecided	8	10%
Strongly Disagree	7	8.75%
Total	**80**	**100**

Source: Field Survey, 2013

Table 11 above shows that 30 respondents representing 37.5 strongly agree that lack of proper resource management, impacted negatively on the on the congestion management in Kano metropolis, 35 respondents agree, 8 respondents representing 10% responds to undecided while 7 (8.75%) strongly disagree. This means that the problem facing congestion management is as a result of lack of proper resource management.

Table 12: Federal Road Safety Commission help in reducing traffic congestion by ensuring that residents of Kano State adhere to Traffic Law thereby reducing the rate of accident.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	45	56.25%
Agree	24	30%
Undecided	3	3.75%
Strongly Disagree	8	10%
Total	**80**	**100**

Source: Field Survey, 2013

Table 12 above shows that 45 respondents representing 56.25% strongly agree that the Federal Road Safety Commission help in reducing traffic congestion by ensuring that residents of Kano State adhere to Traffic Law thereby reducing the rate of accident, 24 respondents representing 30% agree, 8 respondents representing 10% responds to strongly agree while it is only 3.75% respondents that cannot decide. This means that the Federal Road Safety Commission play a significant role in reducing traffic congestion.

Table 13: Traffic congestions obstruct medical, fire and police services from attending to medical, crime and disaster situations.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	38	47.5%
Agree	41	51.25%
Strongly Disagree	1	1.25%
Total	**80**	**100**

Source: Field Survey, 2013

Table 13 above shows the opinion of the respondents on the lack of adequate facilities allocated to the police. 38 respondents representing 47.5% strongly agree and 51.25% that 41 respondents agree. This means that medical, fire and police services which may be unnecessarily delayed from attending to medical, crime and disaster situations, since the majority of the respondents strongly agree and agree respectively.

Table 14: Blockage of access roads within the market and in the market surroundings sometimes lead to unnecessary loss of lives and properties in events of emergencies such as fire accidents.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	15	18.75%
Agree	50	62.5%
Undecided	5	6.25%
Strongly Disagree	10	12.5%
Total	**80**	**100**

Source: Field Survey, 2013

Table 14 shows that 15 respondents strongly agree, 50 respondents representing 62.5% strongly agree that blockage of access roads within the market and in the market surroundings sometimes lead to unnecessary loss of lives and properties in events of emergencies such as fire accidents, while 5 respondents were undecided and 10 respondents representing 12.5% strongly disagree.

Table 15: People in congestion are exposed to air pollution and may be hazardous to their health.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	45	56.25%
Agree	24	30%
Undecided	3	3.75%
Strongly Disagree	8	10%
Total	**80**	**100**

Source: Field Survey, 2013

Table 15 above shows that 45 respondents representing 56.25% strongly agree, 24 respondents representing 30% agree and 3 respondents representing 3.75% responds to undecided while 10% of the respondents strongly disagree. This means that the People in congestion are exposed to air pollution and may be hazardous to their health.

Table 16: Creating awareness among residents of Sabon Gari Market can help to reduce the problem of Congestion in the area.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	30	37.5%
Agree	35	43.75%
Undecided	8	10%
Strongly Disagree	7	8.75%
Total	**80**	**100**

Source: Field Survey, 2013

Table 16 above shows that 30 respondents representing 37.5 strongly agree that creating awareness among residents of Sabon Gari Market can help to reduce the problem of congestion in the area, 35 respondents agree, 8 respondents representing 10% responds to undecided while 7 (8.75%) strongly disagree. This means that the congestion can be minimize if to a bearest minimum.

Table 17: Poor market and road regulations are one of the factors that hindered the effectiveness of traffic control in Kano state.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	25	31.25%
Agree	48	60%
Undecided	2	2.5%
Strongly Disagree	5	6.25%
Total	**80**	**100**

Source: Field Survey, 2013

Table 17 above indicates that 25 respondents representing 31.25% strongly agree, 48 respondents representing 60% agree that Poor market and road regulations are one of the factors that hindered the effectiveness of traffic control in Kano state, while 2 respondents representing 2.25% were undecided and 5 respondents representing 6.25% strongly disagree. This means that the lack of former rules and regulations has made the traffic control ineffective in Sabon Gari Market area of Fagge Local Government area of Kano State.

Table 18: Review of environmental and traffic regulations can help to control traffic congestion in Kano state.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	45	56.25%
Agree	24	30%
Undecided	3	3.75%
Strongly Disagree	8	10%
Total	**80**	**100**

Source: Field Survey, 2013

Table 18 above shows that 45 respondents representing 56.25% strongly agree, that Review of environmental and traffic regulations can help to control traffic congestion in Kano state, 24 respondents representing 30% agree, 8 respondents representing 10% responds to strongly agree while it is only 3.75% respondents that cannot decide. This means that if government can review the environmental and traffic regulations, there will be less traffic congestion in Sabon Gari, Fagge Local government area of Kano State.

Table 19: Loss of working hours, economic set-back and psychological disorder are the economic effect of traffic congestion.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	33	41.25%
Agree	42	52.5%
Undecided	1	1.25%
Strongly Disagree	4	5%
Total	**80**	**100**

Source: Field Survey, 2013

Table 19 above shows that 33 respondents representing 41.25% strongly agree, 42 respondents representing 52.5% agree and 1 respondent representing 1.25% responds to undecided while 5% of the respondents strongly disagree. This means that Loss of working hours, economic set-back and psychological disorder are the economic effect of traffic congestion.

Table 20: Traffic law violation has lead to high rate of accidents in Sabon Gari Market.

RESPONSE	NO. OF RESPONDENTS	PERCENTAGES (%)
Strongly Agree	15	18.75%
Agree	50	62.5%
Undecided	5	6.25%
Strongly Disagree	10	12.5%
Total	**80**	**100**

Source: Field Survey, 2013

Table 20 shows the opinion of the respondents as regards to whether Traffic law violation has lead to high rate of accidents in Sabon Gari Market. 15 respondents representing 18.75% strongly agree. 50 respondents representing 62.5% agree while 5 respondents representing 12.5% were undecided and 10 respondents representing 12.5% strongly disagree. This means that lack of adherence to traffic law has lead to unnecessary accident in Sabon Gari markets.

4.3 Summary of Findings

The findings of this study revealed that:

1. Productivity is reducing as a result of lost of time in traffic congestion.
2. Unnecessary parking by the road side reduces the size of the road and thereby leads to congestion.
3. Traffic congestion affects the movement of people and the flow of goods to the market**.**
4. Lack of proper resource management, impacted negatively on the on the congestion management in Kano metropolis.
5. This means that the Federal Road Safety Commission play a significant role in reducing traffic congestion.

6. The study also revealed that that medical, fire and police services which may be unnecessarily delayed from attending to medical, crime and disaster situations.
7. The study also revealed that that the people in congestion are exposed to air pollution and may be hazardous to their health.
8. The findings revealed that that if government can review the environmental and traffic regulations, there will be less traffic congestion in Sabon Gari, Fagge Local government area of Kano State.
9. It was also revealed that Loss of working hours, economic set-back and psychological disorder are the economic effect of traffic congestion.
10. Lack of adherence to traffic law has lead to unnecessary accident in Sabon Gari markets.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study is the role of the Traffic law and the implication of traffic congestion with a specific reference to Sabon Gari Market, Fagge Local Government Local Area of Kano State. Many urban cities in Nigeria are bedevilled with traffic congestion which tends to defy various remedial measures adopted by different governments over the years. Journey times from one point to another within a town have remained unreliable and residents have continued to face disturbing inconveniences in transportation. These are accompanied by noise and air pollution and the high costs associated with burning of fuels from stationary vehicles.

The contributions of road transportation to environmental degradation in urban cities of Nigeria have been highlighted in the study. The problem is no longer limited to traditional cities such as Lagos, Ibadan, Benin-City, Port Harcourt, Abuja, and Kano state in particular. Virtually every state capital city in Nigeria today faces the problem of traffic congestion. For example, Calabar city which was not previously associated with traffic congestion is now facing considerable traffic congestion on many of its urban roads, particularly when the schools are in session.

The researcher introduces the background of the study, statement of the problem, objectives, research question and the significance of this study in chapter one, review of related literature was carried out in chapter two while the methodology was highlighted in chapter three and the data gathered was analyzed.

The findings reveals that traffic congestion affects the movement of people and the flow of goods to the market, lack of proper resource management impacted negatively on the congestion management in Kano metropolis. The study also shows that Federal Road Safety Commission play a significant role in reducing traffic congestion.

The study also revealed that that medical, fire and police services which may be unnecessarily delayed from attending to medical, crime and disaster situations.

5.2 Conclusion

The study concludes that Road traffic accidents are major public health problem and a leading cause of death and injury around the world. In order to reduce road traffic accident, adequate measures have to be taken. Policies and actions for road safety are taken by the government. Intervention policies are also needed for road safety.

It was also concluded that compliance with traffic regulations by commercial motorcyclists is mixed. While there is total compliance with some rules such as minimum age limit, motorcycle capacity and number plate, there are varying degrees of compliance with others, especially with respect to driver license holding, crash helmet usage, Highway Code awareness and number of passengers carried per trip. The paper suggests the overhauling of the driver licensing scheme and improved enforcement by the agencies concerned. The role of public enlightenment should be explored using the commercial motorcyclist union as a rallying point given the negative influence of unions on compliance issues.

5.3 Recommendations

Based on the findings of the study, the following recommendations were made:

1. Government should provide (recruit) more public health personnel to improve and ensure proper sanitation at the market area.
2. Government should provide enough working materials for proper sanitation of the area.
3. Environmental and traffic laws (regulation) need to be reviewed so as to minimizes the problems of environmental pollution and traffic congestion.

4. There should be adequate public awareness on the traffic congestion so that the road user will be able to adhere to the rules and regulations.
5. More health care services should also be provided to minimize the health risk among the population of the area.
6. Safety can be improved by reducing the chances of a driver making an error or by designing vehicles to reduce the severity of crashes that do occur.

REFERENCES

Ibekwe H. (2008) Fundamentals of Road Safety and Journey Management Lagos Macro Safety Nigeria Ltd. Wikipedia, the free encyclopedia.

Pendakur, V. Setty (2002), Presentation on Road Safety in China and Jiangzi. Presented by at the International Seminar on Road Safety, November 26-28, 2002.

Assum, Terje. (1998). Road Safety in Africa - Appraisal of Road Safety Initiatives in Five African Countries. Working Paper No. 33, SSATP , Africa Technical Department, World Bank, Washington, DC. Available at the Sub-Saharan Africa Transport Policy Program (SSATP) Publications Web site.

Elleveset, Leif and Stein Lundebye (1997), NGO's and their Role in Road Safety. Paper Presented at the Third UN sponsored African Road Safety Conference in Pretoria, South Africa. Unpublished.

Wettland, Thor and Stein Lundebye(1997), Financing Road Safety Activities. Paper presented at the Third UN sponsored African Road Safety Conference in Pretoria, South Africa. Unpublished.

Agresti, Alan (1996). Introduction to categorical data analysis New York: John Wiley and Sons.

Arosanyin, G.T. (2004). Road Accident Data Problems in Nigeria: An Agenda for Reform. Indian Journal of Transport Management 28(4), 478-504.

Arosanyin, G.T (2007). Are Okada Operators Licensed to Ride in Nigeria? A Preliminary Finding. In: Proceedings of the Road Safety on Four Continent, Bangkok, Thailand 14-16 November, 2007. LinKong: VTI, Sweden, 1179-1248.

A Preliminary Investigation. Journal of Logistic and Transport 1(1), 96-104.

Arosanyin, G. T. (2008). Costing Road Crashes in Nigeria and the Need for Further Research. In. Saliu, H. A., Aderinto. A. A., Jimoh, H. I.J. and

Arosanyin, G.T. (Eds.) Perspectives on Nation Building and Development in Nigeria: Environmental and Economic Issues (pp.140-163) Ilorin: Faculty of Business and Social Sciences, University of Ilorin.

Armour, M. (1984). The Effect of Police Presence on Urban Traffic Roads. Research Note RN3/84. Rosebery, NSW: Traffic Authority of New South Wales, III +27p..

Asogwa S. E. (1980). The Crash Helmet Legislation in Nigeria; A Before-and-After-Study. Accident Analysis and Prevention12 (3), 213-216.

Assum, T. (1986). Deterrent Effects of Imprisonment and Fines for Driving while Impaired. Paper presented at the 10th International Conference on Alcohol, Drugs and Traffic Safety, Amsterdam: The Netherlands.

Bailey, J. P. M. (1991). An Evaluation of Community and Regional Programmes for the Control of Drink Driving Accidents in New Zealand. International Medical Advisory Group Conference.

Dingle, V. (1985). Deterring Traffic Offenders through License Actions and License Administration Procedures. In: Proceedings of the International Conference on the Prevention of Traffic Crime, Riyadh, Kingdom of Saudi-Arabia, 72-86.

Elvik, R and Vaa, T (2004). The Handbook of Road Safety Measures. Amsterdam: Elsevier Science. European Commission (EC) (2003). Saving 20,000 Lives on Our Roads: A Shared Responsibility. Luxembourg: Office for the Official Publications of the European Communities.

Evans, L. (1991). Traffic Safety and the Drivers. New York :Van Nostrad Reinhold.

Evans, L. & Frick, M. C (1986). Safety Belt Effectiveness in Preventing Drivers Fatalities Versus a Number of Vehicular, Accident, Roadway and Environment Factors. Journal of Safety Research, 17 , 143-154.

Federal Republic of Nigeria (FRN) (2004). National Road Traffic Regulation 2004. The Federal Government Press. Lagos.

Federal Republic of Nigeria (FRN)(2008). Nigeria Highway Code. Abuja: Federal Road Safety Commission.

Goodman, L. A. and W. H. Kruskal, W.H. (1972). Measures of Association for Cross-Classification IV. Journal of the American Statistical Association, 67, 415-421.

Iribhogbe, P. E & Odai, E. D. (2009). Driver-Related Risk factors in Commercial Motorcycle (Okada) Crashes in Benin City, Nigeria. Pre-hospital and Disaster Medicine 24 (4), 356-359.

Kulanthayan, S., Radin Umar, R. S. et al. (2000). Compliance of Proper Safety Helmet Usage in Motorcyclists. Med. J. Malaysia 55 (1), 40-44.

Liebetrau, A. M. (1983). Measures of Association. Quantitative Applications in the Social Sciences Series No. 32. Newbury

Park, CA: Sage Publications. Morgan, C. (1999). Effectiveness of Lap/Shoulder Belts in the 100Copyright © Canadian Academy of Oriental and Occidental Culture Compliance with Road Safety Regulations Among Commercial Motorcyclists in Nigeria Back Outboard Seating Position.

Owoaje, E. T., Amoran, O.E., Osemeikhain, O., Ohnoferi, O.E. (2005). 'Incidence of Road Traffic Accidents and Pattern of Injury Among Commercial Motorcyclists in a Rural Community in South Western Nigeria. J. Community Med. Prim Health Care, 17, 7- 12.

Riley, D. (1991). Drink – driving: The Effects of Enforcement. London: Home Office, Research and Planning Unit, 1991 XIII+78p. Home Office Research Study: 121.

Robinson, C & Smiley, A. (1989). Driver License Disqualification: A Review of the Literature. Ministry of Transportation of Ontario, Canada.

Rosenberg, M. (1968). The Logic of Survey Analysis New York: Basic Books.

Ross, H. L (1988). Deterrence – based Policies in Britain, Canada and Australia. In: M. D Laurance, J. R. Snortum & F. E Zimring (Eds.). The Social Control of Drinking and Driving (pp. 64-78). Chicago: University of Chicago Press.

Shimamura, M., Mainaro Yamazaki & Goro Fujiti (2005). Method to Evaluate the Effectiveness of Safety Belt Use by the Rear Passengers on the Injury Severity of Front Seat Passengers. Accident Analysis and Prevention. 37, 5-17.

Southgate, P. & Mirrlees Black, C. (1991). Traffic Policing in Changing Times (pp.139). London: Home Office Research and Planning Unit. Home Office Research Study: No. 124.

Wilden, P. A., Phillis, W.G. & Cabon, T. (1989). The Use of Warning Letters as a Means of Moderating Road User Behaviour. Journal of Behaviour Modification, 49 (2), 102-117.

Williams, S. H., Gerner, G. T. & Philby, F. N (1992). The Use of Traffic Offence Points and License Suspension as a Means of Deterring Motorists Who Have Committed Less Severe Traffic Offences. In: W. D. Smith (Ed.) The Prevention of Road Traffic Accidents: An Overview of Behavioural Modification Techniques (pp. 85-97) Chicago: University of Chicago Press.

Wood, D. F. & Johnson, J.C. (1993). Contemporary Transportation (2nd Ed.). Tulsa: PennWell Publishing Company.

World Health Organization (WHO) (2011). Global Plan for the Decade of Action for Road Safety 2011-2020. Geneva: WHO.

Zaal, D. (1994). Traffic Law Enforcement; A Review of the Literature. Report No 53 Clayton, Victoria: Monash University Accident Research Centre.

APPENDIX I

DEPARTMENT OF SOCIOLOGY
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
BAYERO UNIVERSITY, KANO

Dear Sir,

LETTER OF INTRODUCTION

I am a student of the above institution currently conducting research on **Traffic Law and the Implications of Traffic Congestion at Sabon Gari Market, Kano State.** The aim of this research is to obtain adequate and relevant data that could serve as basis for getting insight on the subject matter.

Here are some questions for you to tick the appropriate alternative please, any information given by you will be treated with absolute confidentiality and exclusively for academic purposes.

Thank you.

Yusuf Garba
Researcher

APPENDIX II

QUESTIONNAIRE

SECTION A PERSONAL DATA

1. Sex:

   (a) Male [ ] (b) Female [ ]

2. Age of respondents

   (a) 18-25 [ ] (b) 26-35 [ ] (c) 36-45 [ ] (d) 46 and above [ ]

3. Marital Status:

   (a) Married [ ] (b) Single [ ] (c) Divorce[ ] (d) widow [ ]

4. Level of Education

   (a) Primary [ ] (b) Secondary School [ ] (c) Tertiary Institution [ ]

5. Occupation:

   (a) Civil Servant [ ] (b) Business [ ] (c) Petty Trading [ ]

   (d) Farmer [ ]

SECTION B:

1. Congestion Occur where there is no adequate planning on road network.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

2. Congestion lead to decrease productivity through lost time and causes stress and put additional wear on our vehicles.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

3. Indiscriminate parking of vehicles along roadsides also results in congestion as it reduces the road width.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

4. Market people contribute a lot in creating congestion of road traffic in Sabon Gari, thereby attracting road traffic accident.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

5. Traffic congestion affects the movement of people and the flow of goods to the market.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

6. Lack of Proper Resource Management, impacted negatively on the congestion management in Kano metropolis.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

7. Federal Road Safety Commission help in reducing traffic congestion by ensuring that residents of Kano State adhere to Traffic Law thereby reducing the rate of accident.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

8. Traffic congestions obstruct medical, fire and police services from attending to medical, crime and disaster situations.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

9. Blockage of access roads within the market and in the market surroundings sometimes lead to unnecessary loss of lives and properties in events of emergencies such as fire accidents.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

10. People in congestion are exposed to air pollution and may be hazardous to their health.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

11. Creating awareness among residents of Sabon Gari Market can help to reduce the problem of Congestion in the area.
   a. Strongly Agree [ ]
   b. Agree [ ]
   c. Undecided [ ]
   d. Disagree [ ]
   e. Strongly Disagree [ ]

12. Poor market and road regulations are one of the factors that hindered the effectiveness of traffic control in Kano state.
    a. Strongly Agree [ ]
    b. Agree [ ]
    c. Undecided [ ]
    d. Disagree [ ]
    e. Strongly Disagree [ ]

13. Review of environmental and traffic regulations can help to control traffic congestion in Kano state.
    a. Strongly Agree [ ]
    b. Agree [ ]
    c. Undecided [ ]
    d. Disagree [ ]
    e. Strongly Disagree [ ]

14. Loss of working hours, economic set-back and psychological disorder are the economic effect of traffic congestion.
    a. Strongly Agree [ ]
    b. Agree [ ]
    c. Undecided [ ]
    d. Disagree [ ]
    e. Strongly Disagree [ ]

15. Traffic law violation has lead to high rate of accidents in Sabon Gari Market.
    a. Strongly Agree [ ]
    b. Agree [ ]
    c. Undecided [ ]
    d. Disagree [ ]
    e. Strongly Disagree [ ]