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(NMetS)

Assessment of the Integration of Climate Change and Sustainable Development in Nigerian Cities

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Abstract

There are many links between climate change and sustainable development. Despite the relationship, there is no direct link between sustainable development and climate change. This paper examines the relationship that can exist by integrating climate change and sustainable development approaches in Nigeria. It focuses on the concepts and methods that may have some important benefits to resilient cities; it also discusses recent developments in both the climate change and sustainable development literature and method of integrating them. The data for the study was obtained mainly from secondary sources. This was arranged into scenarios that were statistically analyzed. Six scenario groups were used and organized into four scenario families. Each family was analyzed using a narrative storyline. Six scenarios were selected to illustrate the whole set of scenarios. These six illustrative scenarios include one representative scenario from each of the four families. The analysis indicated that, sustainable development and climate change interact profoundly on a number of levels. Reducing greenhouse gas emissions and increasing adaptability has contributed to a range of sustainable development goals unrelated to climate in cities. The result also indicated that there is need for an approach to scenario analysis that integrates all aspects of climate change and sustainable development and the critical importance of alternative development paths and the assumptions. The research recommends that sustainable development policies can make a major contribution to reducing greenhouse gas emissions, even in the absence of explicit climate policy. It is concluded that there is possible relevance of sustainable development to climate change.

Keywords: Cities; Sustainable Development; Climate Change; Integrated Assessment; Scenarios.

1. Introduction

Sustainable development is a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [1]. Albeit somewhat vague, this concept of sustainable development aims to maintain economic advancement and progress while protecting the long-term value of the environment; it "provides a framework for the integration of environmental policies and development strategies" [1]. The key principle of sustainable development underlying all others is the integration of environmental, social, and economic concerns into all aspects of decision making. All other principles in the Sustainable Development framework have integrated decision making at their core. It is this deeply fixed concept of integration that distinguishes

sustainability from other forms of policy. The precautionary principle establishes that "where there are threats of serious or irreversible damage; lack of full scientific certainty shall not be used as a reason for postponing cost-effective measure to prevent environmental degradation" [3]. Therefore, the proponent of an activity bears the burden of proving that this action will not cause significant harm. Explicitly stated in the Rio Declaration, the notion of common but differentiated responsibilities recognizes that each nation must play their part on the issue of sustainable development. Climate change is a long-term shift in the statistics of the weather (including its averages). For example, it could show up as a change in climate normal (expected average values for temperature and precipitation) for a given place and time of year, from one

decade to the next [4] The global climate is currently changing, the last decade of the 20th Century and the beginning of the 21st have been the warmest period in the entire global instrumental temperature record, starting in the mid-19th century. Climate change is a normal part of the Earth's natural variability, which is related to interactions among the atmosphere, ocean, and land, as well as changes in the amount of solar radiation reaching the earth. The geologic record includes significant evidence for large-scale climate changes in the Earth's past. Climate change as a phenomenon is a **Human-induced change through the release Greenhouse Gases** Certain naturally occurring gases, such as carbon dioxide (CO₂) and water vapour (H₂O), trap heat in the atmosphere causing a greenhouse effect. Burning of fossil fuels, like oil, coal, and natural gas is adding CO₂ to the atmosphere. The current level is the highest in the past 650,000 years. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change concludes, "That most of the observed increase in the globally averaged temperature since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations" [4]

There are many alternative definitions of sustainable development, and none is universally accepted. Nonetheless, they all emphasise one or more of the following critical elements: identifying what to develop, identifying what to sustain, characterising links between entities to be sustained and entities to be developed and envisioning future contexts for these links [5]. Authors have emphasised the economic, ecological and human/social dimensions that are the pillars of sustainable development [6].

The concept of sustainable development has permeated mainstream thinking over the past two decades. Agenda 21 that is integral part of the World Conference corroborated with the 2002 World Summit on Sustainable Development [7] which made it clear that sustainable development had become a widely-held social and political goal. Climate change, however, adds to the list of stressors that challenge our ability to achieve the ecologic, economic and social objectives that define sustainable development.

This paper examines the relationship that exists and can exist by integrating climate change and sustainable development approaches in Nigeria. It focuses on the concepts and methods that may have some important benefits to resilient cities; it also discusses recent developments in both the climate change and sustainable development literature.

2. Discussions and analyses of Scenarios

The scenarios for this study were selected from six situations that are analysed statistically. These scenarios are grouped into four scenario families [6]. For each family of the scenario, a descriptive study was analysed; numerous demonstration clusters distinguished to justify the scenario [8]. The selected six scenarios were combined to discuss what happened in the event of integrating climate change to sustainable development. These six illustrative scenarios include one representative scenario for each of the four families as well as two additional scenarios. The four families are grouped into homogeneous and heterogeneous family scenarios. The homogeneous scenarios are the Global Family Scenario and Environmental Family Scenario that explore alternative energy development and its attributes are shown in Table 1.

The Environmental Family Scenario harmonizes the driving forces; for each family (Energy, Technology, Economy, Social and Environmental forces). The heterogeneous family includes: Regional Family Scenario which present a future that indicated regional identifies that can be strengthened as shown in Table 1. The two additional scenarios are sustainability and climate change with attributes shown in Table 1.

The analysis of the integration of climate change and sustainable development by SRES [9] indicated that, emission of green house gas (GHG) is contentious and its localization in Nigeria has proven that the four family's emission is extremely large (The GHG in 1990 has increased by 5 folds in 2014)

It is important to remember that these are all reference scenarios that assume no climate policy, just different assumptions about driving forces.

On the other hand, the SRES analysis also shows that alternative combinations of the driving

forces in the Environmental Family can lead to similar levels of GHG emissions by the end of the next century [10]. The implications of these findings for sustainable development issues are profound. They suggest that development path decisions may be more important than climate policy decisions, even in determining climate impacts, risk, costs and benefits.

However, there is no easy linkage between such development path decisions and emissions. In other words, climate change and sustainable development are profoundly linked, but in complex ways. The definition of sustainable development is to be considered

Table 1: Family and Scenarios of integrating Climate Change and sustainable Development

Families	Scenario	Characteristics	Attribute
Global	Global	Homogeneous	<ul style="list-style-type: none"> • High Rate of Change in Technology • High economic Growth • Low Population
	Sustainability	Homogeneous	<ul style="list-style-type: none"> • High Rate of Change in Technology • Low Population • Strong Sustainability
Environmental	Environmental	Homogeneous	<ul style="list-style-type: none"> • High Population • High Economic Growth • High Technological Advancement • High Energy Consumption • Intervening Land uses • Urban Agriculture
Regional	Regional	Heterogeneous	<ul style="list-style-type: none"> • High Population Growth • Medium Economy
Economic	Economic	Heterogeneous	<ul style="list-style-type: none"> • High Economic Growth • Cultural convergence
	Climate change	Heterogeneous	<ul style="list-style-type: none"> •

from three necessities: the ecological necessity to remain within biophysical carrying capacity, the economic necessity to provide an adequate material standard of living for all people, and the social necessity to provide systems of governance that propagate the values by which people want to live as shown in Table 2. Because of the many interconnections among the three necessities, it is impossible to address any one of three in isolation. In fact, they need simultaneous reconciliation.

Pillars of Sustainable Development	Characteristics
Ecological Imperative	To stay within biophysical carrying capacity
Economic Imperative	To provide an adequate material standard of living for all
Social Imperative	To provide systems of governance that propagate the values that people want to live by

3 Integrating Sustainable Development and Climate Change

The concept of sustainable development has been closely associated with an attempt to integrate social and economic issues into the environmental agenda. Arguably, this was the central message of the Brundtland report which argued, among other things, that at the global level, environmental issues could simply not be successfully addressed in isolation from human problems of poverty and development. The ambit of sustainable development is much broader than the old

agenda of environmental concern, bringing to the fore such issues as poverty, income distribution, trade, investment, wealth creation, competitiveness, and jobs, as well as the more familiar issues of resource depletion, pollution, biodiversity loss and protection, species conservation, maintenance of essential life support systems, and environmental ethics. An attempt to integrate social, economic and environmental issues at any spatial scale

speedily confronted by the existence of a huge array of public policy, institutional/organizational, and behavioural issues of almost bewildering complexity. In a world where environmental conditions are deteriorating rapidly in many regions, where economic conditions are grim or worse in others, and where systems of governance are breaking down into chaos, a belief in the possibility of some kind of integrated response that simultaneously addresses the three dimensions of sustainable development may seem somewhat naive.

Yet it is also becoming increasingly apparent that the linkages among these various issues are not just rhetorical. Poverty is often closely linked, as both cause and consequence, with environmental degradation, and economic growth is tied in complex ways with social development and environmental conditions. In this connection, sustainable development offers a new way to conceptualize, and analyse such options, and a new way to organize our thinking about future possibilities. It is no accident, for example, that the global scenario analyses of the World Business Council on Sustainable Development [11], the Global Scenarios Group and the IPCC SRES [9], use sustainable development or sustainability as an organizing principle for some of their scenarios. A key characteristic of most sustainable development analysis and policy is the attempt to provide some framework in terms of which ecological, social, and economic dimensions can be integrated. The diversity of ways in which this is done, and the ambiguity and vagueness inherent in the concept of sustainable development, mean that there is no single approach to integration [12]. We have therefore chosen to outline briefly one such framework, as an example of how such integration may be approached.

4. Linkages between Climate Change and Sustainable Development

One legacy of the science-driven nature of the climate change research process has been a kind of sequential view of the climate change from driving forces to emissions, atmospheric concentrations, changes in the physical climate system, impacts, and adaptation. While, this view has a certain elegance to it, it grossly oversimplifies a complex process of

feedbacks and inter-relationships and also relegates crucial aspects of the human dimensions of climate change to the status of exogenous variables, as either 'drivers' or responses [7].

Adaptation to climate change has an impact on the environment that is consistent with a complex adaptive systems approach [13]. The general idea is that flora and fauna continuously adapt to a range of changes in the biophysical, economic, and socio-cultural environment. Some of these adaptations have direct connection with climate change; many more occur for non-climate related reasons but have significant effects on greenhouse gas emissions or climate change impacts.

Given the inter-relatedness of ecological, social, and economic systems, it was discovered that holistic view has to be taken, including some awareness of trade-offs among competing goals. It also permits issues like climate change to be contextualized in terms of sustainable development issues.

5. Recommendations

There is a proposal of twin strategy that intended to contribute to simultaneous reconciliation of the three imperatives: dematerialization and re-socialization. Dematerialization involves uncoupling economic activity from the throughput of matter and energy to an economy by significantly reducing the material and energy inputs to production (Figure 1). In other words, it involves vastly improving the efficiency by which natural resources are used.

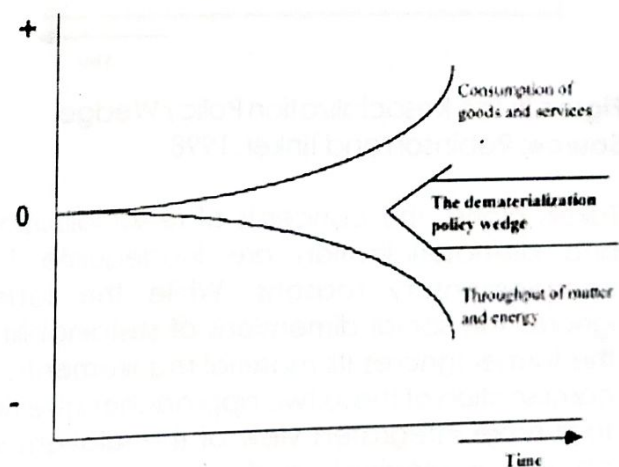


Figure 1: The Dematerialization Policy Wedge
Source: Robinson and Tinker, 1998.

Dematerialization If successful, holds the promise of significantly improving our ability to provide for growing material needs without increasing, and perhaps reducing, environmental impacts. However, it addresses only the environmental efficiency of the production system. It is a technical fix and, as such, ignores the social dimensions of sustainability.

To address these issues, it is proposed that the strategy of re-socialization, which involves uncoupling human well-being from economic activity through the building up of social capital and its substitution for formal economy consumption. Re-socialization focuses on the demand-side, on consumption and also governance issues (Figure 2). It involves the recognition that many forms of social activity and behaviour that people value are not measured in terms of economic output. Indeed, the development and maintenance of many forms of social capital take place entirely outside the formal economy and are simply not measured by traditional indicators of economic activity.

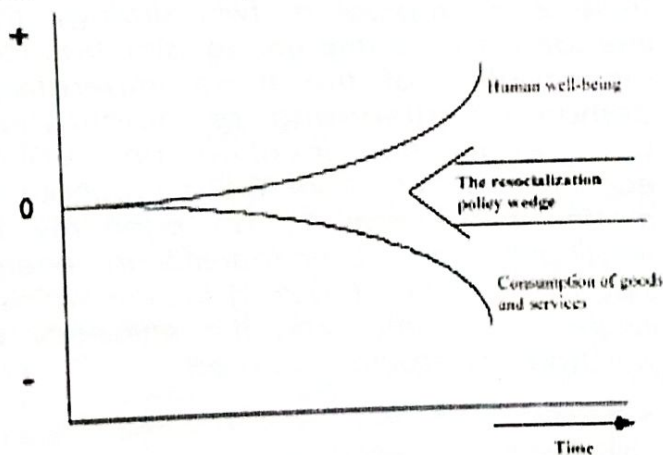


Figure 2: The Resocialization Policy Wedge
Source: Robinson and Tinker, 1998.

Taken alone, the concepts of re-socialization and dematerialization are inadequate for complementary reasons. While the latter ignores the social dimensions of sustainability, the former ignores its material requirements. A combination of these two approaches give rise to a more integrated view of the relationship among ecological, social and economic systems as shown in Figure 3.

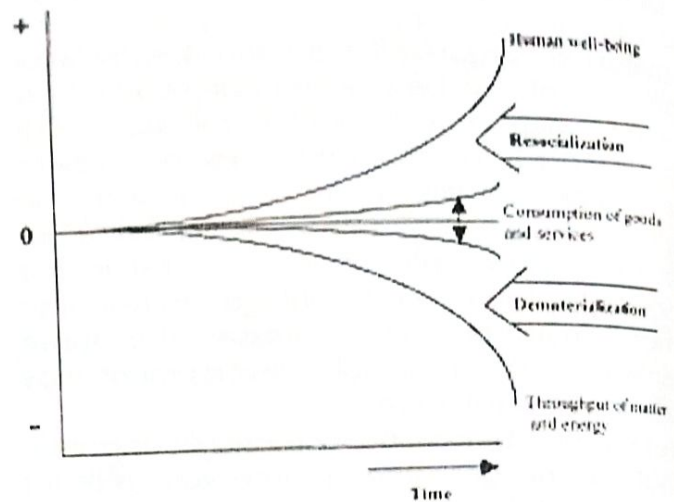


Figure 3: The integration Policy Wedge
Source: Robinson and Tinker, 1998.

Second, recognition of this interconnectedness suggests the desirability of going beyond a narrow treatment of climate change issues. It is important not to sub-optimize on climate change issues, but to instead consider linkage with other types of policy, since these may prove to have more significant effects on emissions and impacts.

Third, the emergence of 'development, equity and sustainability' as a cross-cutting issue in the work of the IPCC offers a major new opportunity to contextualize climate change issues in a sustainable development framework [2]. This would have the advantage of making climate change more relevant to policy by grounding climate change in real world sustainable development issues.

Fourth, a central insight emerging from both the sustainable development and climate change fields is the critical importance of alternative development paths and the assumptions about the reference case or baseline that underlie any analysis.

Fifth, this in turn suggests the need for an approach to scenario analysis that integrates across all aspects of climate change and sustainable development research. On the climate side, given the sequential process of developing emission scenarios, climate scenarios, and impact scenarios, much can be learned about how to link environmental issues with social and economic ones from the very detailed scenario and modeling work in the climate field.

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IN THE BUILT ENVIRONMENT**

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FOREWORD

The organising committee of the 2nd School of Environmental Technology International Conference is pleased to welcome you to Federal University of Technology Minna, Niger State Nigeria.

The conference provides an international forum for researchers and professionals in the built and allied professions to address fundamental problems, challenges and prospects that affect the Built Environment as it relates to Contemporary Issues and Sustainable Practices in the Built Environment. The conference is a platform where recognised best practices, theories and concepts are shared and discussed amongst academics, practitioners and researchers. The scope and papers are quite broad but have been organised around the sub-themes listed below:

- Architectural Education and ICT
- Building Information Modeling
- Construction Ethics
- Energy efficiency and Conservation
- Environmental Conservation
- Facility Management
- Green Construction and Efficiency
- Health and Safety Issues
- Information Technology and Building Maintenance
- Information Technology and Construction
- Information Technology and Design
- Innovative Infrastructure Development
- Resilient Housing Development
- Smart Cities Development
- Social Integration in Cities
- Sustainable Building Materials Development
- Sustainable City Growth
- Sustainable Cost Management
- Sustainable Property Taxation
- Sustainable Architectural Design
- Sustainable Urban Transportation Systems
- Theory and Practices for Cost Effectiveness in Construction Industry
- Urban Ecology Management
- Urban Land Access
- Disasters, Resilient Cities and Business Continuity

We hope you enjoy your time at our conference, and that you have the opportunities to exchange ideas and share knowledge, as well as participate in productive discussions with the like-minded researchers and practitioners in the built environment and academia.

**Local Organising Committee
School of Environmental Technology International Conference (SETIC) 2018
APRIL 2018**

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ASSESSMENT OF THE EXTENT OF TRAFFIC CONGESTION IN SELECTED TRAFFIC APPIAN IN MINNA, NIGERIA

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Traffic congestion has become a major challenge in major urban roads in Nigeria and Minna is not an exception to these challenges, which ranges from socio-economic to safety concerns on the lives of urban residents. This research therefore pursued the objectives of evaluating the nature of traffic congestion; assess the extent of congestion encountered in the selected traffic corridors; and analyse the impact of the congestion on urban accessibility in Minna, Nigeria. This research selected two major traffic corridors in Minna, which includes the primary apian that runs through the centre of the city which is the Suleja-Minna-Zungeru Road and the Western Bye pass. The research employs a comprehensive field survey and traffic count to analyse the nature of traffic, the extent of the congestion challenge and the various impact it poses to urban life in the selected corridors. The research findings show that, various peak and off-peak periods were identified at different times of the day, the traffic components identified in the selected corridors include cars, motorcycles, tricycles, and trucks. The research findings showed that the menace of congestion ranges from one osten point to the other on the selected traffic corridors. It is therefore recommended that, effective legislation and enforcement of traffic laws is required to deter some of the urban road users to comply with traffic rules must be put in Place and also raise the revenue base of the state government through surcharges and fines for traffic violations. Conclusively, it is quite pertinent to note that urgent attention should be focused on regulation the traffic situation in these selected corridors in order to attain sustainable urban transportation in the City.

Keywords: Cordon points, Traffic congestion, Traffic corridors, Traffic components, Sustainable urban transportation

INTRODUCTION

Transportation is inherently central to the development of nations, as it is not only a necessity of life but have a resultant effect on all aspects of human existence (Oyesiku, 2002). Oni (2004) described transport as the life wire of any urban environment. Without transport, life, as it is today, would be inconceivable; as it is central to the flow of knowledge, information and commercial goods (Oluwasegun, 2015). Transport is particularly crucial in the existence of a city and cities over the world remain the focal point in an economy where people come together primarily to exchange goods and interacts (Oluwasegun, 2015). Indeed, the transportation sector all over the world is generally recognized as being in a state of crisis, particularly, Nigerian cities have continued to expand in recent time and transport supply falls below the demand (Oluwasegun, 2015). The continued alarming growth of urban population is one of the major factors partly contributing to the rate of physical development in Nigerian cities (World Bank, 2006).Despite the opportunities, however, Nigeria is experiencing increasing rate of urban mobility problems (Oyesiku, 2002). Ogunsanya (1983) noted that urban transportation problem started with increasing urbanization leading to urban transport problems such as traffic congestion.

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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) in 2007, Cities and traffic have developed hand-in-hand since the earliest large human settlements (Fadairo, 2013). The same forces that draw inhabitants to congregate in large urban areas also lead to intolerable levels of traffic congestion on urban streets and thoroughfares (OECD, ECMT 2007). This captures the relationship between cities and traffic congestion as well as the world-wide dimension of the problem of traffic congestion in cities (Fadairo, 2013).

Traffic congestion is a major transportation problem of Nigerian cities. It occurs when urban road network is no longer able to accommodate the volume of traffic that uses them; it increases travel cost and causes physical and psychological discomfort (Jaco, 2008). The chaotic situation is observable in virtually all the road corridors in Minna Metropolis (Badamasi, 2014). Consequently, all over the major roads in Minna Metropolis, a large number of people and vehicles are seen crawling along the roads (Badamasi, 2014).

Minna the capital city of Niger State is largely populated because of the commercial activities going on within the town. Considering the fact that Minna is the capital, one should expect the influx of civil servants into the city. State and Federal Government workers within the state will most likely reside in the city for easy access to their different places of work. The 2017 projected population figure of Minna is 505,999 with growth rate of 3.4%.

The rapid increase in urbanization has a tremendous impact on the traffic system of cities in developing countries (Ogunbodede, 2003). According to the United Nation in 2012, the world population will reach 7.3 billion in July 2015 and that 83 million people will be added to the world's population at the end of 2016. This trend will continue because of the rapid growth in population, resulting from improvement in health services and the multifarious functions performed by cities, which have been another major attractive force. The situation as described above has its impact on traffic in the cities of developing world. Thus, the activities, which take place in them, make them generators and attractors of traffic, which, of course, has implications on mobility (Ogunbodede, 2003).

Urban areas have been noted to be very busy with automobiles, especially during the peak periods. During such peak periods, traffic noise comes from vehicle engines, exhaust systems and horns. Busy urban roads generate between 70-85 decibels of noise, depending on the characteristics of the traffic, speed and type of road surface (Ameyan, 1996). The tolerance level of noise is put at 66-68 decibels; meaning that with 70-85 decibels, a significant number of people are irritated and the negative effect of noise on health could be better imagined.

Illegal parking is also a contributing factor to this ugly trend. This is because of parking on roadside, which is a common phenomenon, reduces the traffic corridors meant for the efficient movement of automobiles. Thus, it becomes a major problem in cities and especially in the Central Business District (CBD), where multi-storey buildings are common and the land use is devoted mostly to commercial purposes (Ayotunde, 2013). The resultant effect of such illegal parking, therefore, is traffic congestion. This illegal parking leads to increase in travel time and increases the cost of traveling because more fuel is used up in the process of accomplishing a delayed journey (go-slow/traffic jam) (Ayotunde, 2013).

Traffic congestion is a major transportation problem of many Nigerian cities. If this is true then efforts will be geared towards cost-effective management of the problem (Ogunsanya, 2002). 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.

Most of these identified traffic congestion related problems still persist in our cities of which Minna is no exception. This research therefore, addresses the problems of traffic congestion amongst selected road corridors in Minna metropolis.

Aim and Objectives

The aim of this study is to compare road traffic congestion along some selected major traffic corridors within Minna metropolis, Nigeria. The specific objectives are:

1. Identify the existing road corridors in Minna metropolis;
2. Classify the identified road according to hierarchy;

3. Carry out spatio-temporal analysis to ascertain the rate of congestion along selected road corridors; and
4. Evaluate the extent of congestion along selected road corridors;

Study Area

The study area is Minna which is the administrative capital of Niger State. Minna is in the middle belt of Nigeria, situated in the wet tropical or guinea climate in the guinea savanna zone. It extends on latitude 9°36'22"N and longitude 6°33'15"E. Minna lies on a valley bed (i.e. lowland) bordered to the east by Paida hill stretching eastwards toward Maitumbi and northwards to Maikunkele village, to the west and the southward is highland, with an area essentially savannah and quite conducive for farming. Minna falls under the tropical continental wet and dry climate based on the Koppen classification scheme. Hence it has a distinct wet season as well dry season. Minna is invaded by two distinct air masses, one from the north; dry and continental in origin, the Sahara air mass. The other is from the Atlantic in the south; moist cool and equatorial in nature. The weather depends to a large extent on the air mass which covers its area and depth. Annual rainfall distribution pattern shows a maximum of 130mm rainfall and minimum of 900-1000mm. the rainy season is between April and October covering a period of six months of September has the maximum rainfall. A monthly rainfall value in excess of 400mm occurs in Minna and its environs (Garber, 2002).

Landscape area of Minna is characterized by an undulating topography. The geological structure depicts steep sloping rock outcrop on the north and eastern flank. These rock outcrops (on the eastern flank); forms a physical constriction on the eastern flank. There are also large but isolated rock outcrops in this landscape and also some areas of scattered rocks. In other words, land beyond the presently developed strip is suitable for development but needs careful planning to keep engineering cost of converting, bridges, embankments and drainage works low to the north over the hills there are some developable lands but intersperse with poor land to the south the land offers reasonable development possibilities but is curtailed by the Chanchaga river. There is a major drainage channel fed by many minor drainage flows from the Centre of the town south-west wards at some other locations, these drainage flood large areas of lying terrain especially after heavy downpour (Garber, 2002). Figure 1.1 and 1.2 shows Niger state in the national context and Minna in the state context respectively. Figure 1.3 shows Minna metropolis the study area.

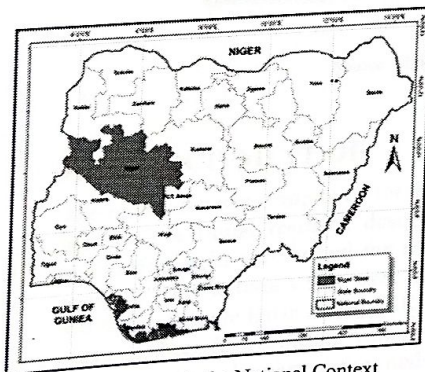


Figure 1.1: Niger State in the National Context
Source: Researcher's Modification, 2017.

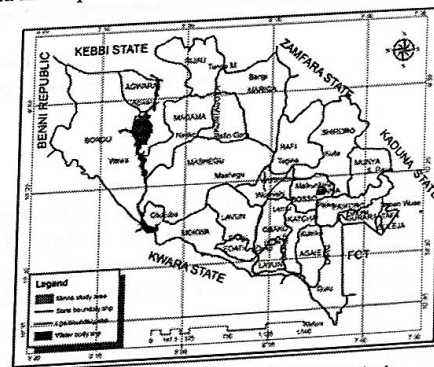


Figure 1.2: Minna in the State context.
Source: Researcher's Modification, 2017.

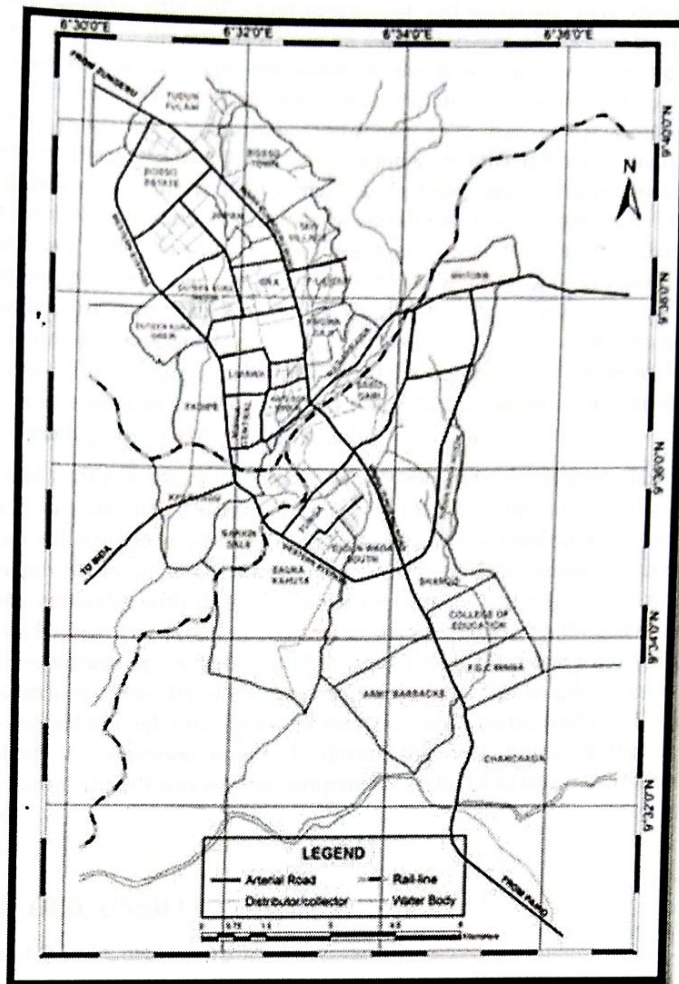


Figure 1.3: Minna Metropolis
 Source: Ministry of Land and Housing, Niger state.

RESEARCH METHOD

The research design employed for the sake of this research is the survey research design and the cross-sectional research design. It explains the process of collecting data through conducting field survey and the use of instrument for on-the-spot collection of data for analysis. The materials that were used in achieving the aim of this research include high resolution Google Earth maps, ESRI ArcMap (10.1), a 12channel XL Garmin GPS receiver, a record sheet for recording volumetric count, a street map guide and internet sources for secondary data. As part of the method for data collection, a volumetric traffic count was embarked on to obtain spatio-temporal pattern of traffic over a selected period of time on the selected corridors in the metropolis from 6 a.m in the morning to 6 p.m in the evening at intervals of two (2) hours. The volumetric count examined traffic during selected days of the week. The volumetric count took note of traffic at the start of working days (Monday), during mid-week (Wednesday), the end of working days (Friday) and then a weekend (Saturday). This helped establish the peak periods of each corridor studied. At the various selected corridors, research assistants were positioned within the specified time frame to help with the traffic count. Traffic component counted during the volumetric count were; cars (private cars and taxis), motorcycle, tricycle, buses (mini-buses and luxury buses), trucks/trailers/vans and bicycles. A record sheet was used in the field to collect the volumetric count data after which they will be checked, edited and integrated for analysis. Table 3.1 shows the volumetric count table format adopted for the sake of this research.

All responses to the research data collection instrument and materials were checked and edited. Descriptive analysis of the volumetric count conducted was performed by means of frequency distribution and percentages, the result of which was presented using graphs, charts and tables. Microsoft Office (Excel and Word) was used to aid analysis. As part of the research process, inputs from volumetric count were organized comprehensively and analysed geo-spatially using ArcMap. The advancement in GIS enhances analysis and allows swift interpretation for better policy making. In Geographic Information System (GIS), there is a wide variety of data source, though all fall into two categories; primary and secondary data sources. For the sake of this research, data used in the Geographic information system are primary in nature. They include the high resolution satellite image captured from Google Earth viewer, the Street Map Guide from Niger State Ministry of Land and Housing which was geo-referenced and digitized, and volumetric count data collected during the field survey. These entire data sources aided the generation of attribute data. The attribute data are been stored in a relational structured format often characterized by a collection of tables relating object to their properties.

Analysis of the road traffic network of Minna Metropolis was developed showing the position of the Arterial roads and Distributor/Collector roads within the study area, road related attribute data will also be generated through analysis of the road network which will also help check the possibility of an alternative route. Attribute data generated via analysis will also show road networks with different congestion levels and hot/cordon points by congestion in the study area. The extent of congestion was measured via the aid of a buffer analysis in the GIS environment. A buffer analysis was established using the volumetric count of each peak periods of the day along the corridor studied. The lengths of each of the corridors were ascertained through a road network statistical analysis on ArcGIS. Thus aided measuring the extent of congestion especially during the peak hours of the day, the overlapping technique in ArcGIS was used to compare the trend of extent for different days of the week studied.

RESULTS AND DISCUSSION

Mapping of Selected Road Corridor

This research is primarily confined to selected road corridors characterised by the disturbing menace of congestion. Road hierarchy was used as a basis for the selection of these corridors. For the sake of effective and reliable analysis, road corridors of the same hierarchy were selected and compared. On a hierarchy based classification, Minna road corridor is classified into three broad types namely; the Arterial road, the Distributor/Collector road and the Access road. Statistics from the Federal Road Safety Commission (FRSC) in 2016 revealed that the two apian that runs through the centre of metropolis suffers major crisis resulting from the menace of congestion. This served as a basis for selecting the corridors for study.

Volumetric traffic count along corridor A (Western By-Pass carrying streams of traffic from Bosso, Dutsen Kura Hausa and Dutsen Kura Gwari to Kpakungu) Figure 4.2 summarizes the traffic distribution for the observed days of the week along the corridor under study. The most noticeable congestion problem along the study corridor was during the peak hour (between 8:01 am and 10:00 am) while coming from Bosso, Dutsen Kura Hausa and Dutsen Kura Gwari. This is because of the concentration of individual workers that leave for work during the morning and staffs and students of the Federal University of Technology Minna who have activities to engage in at Gidan Kwano campus. The type of congestion experienced during this period is the synchronized-flow congestion characterized with significant drop in the speed of vehicles with no noticeable change in the flow rate.

It could be deduced from figure 4.2 that the two peaks periods were constant for all the days of the week observed. The hours of the day associated with the peak periods are from 8:01 am – 10:00 am (morning Peak) and 2:01 pm – 4:00 pm (evening peak). This however is in line with the reality of two peak periods of congestion. Figure 4.3 reveals that traffic is at its highest on Monday. The implication of this is that it leads to the clogging of the corridor which often leads to terrible traffic on Monday. This is justified by the fact that Monday is the first day of the week.

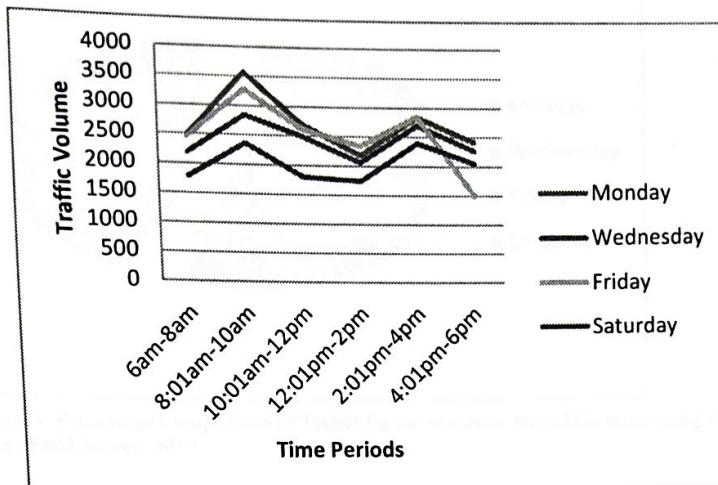


Figure 4.3: Percentage Composition of Traffic for the observed days of the week along corridor A.
Source: Field Survey, 2017

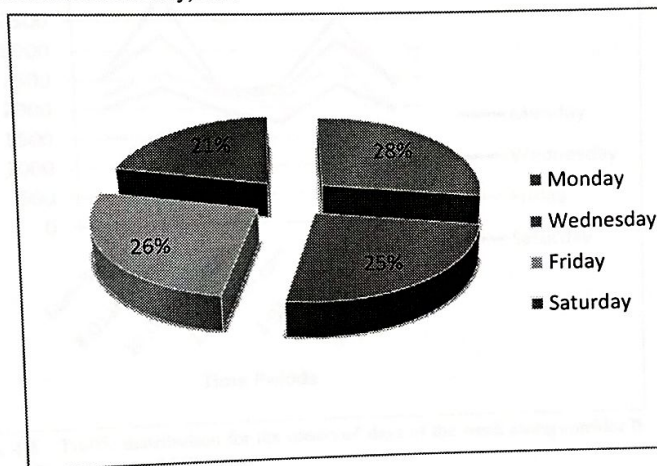


Figure 4.2: -Traffic distribution for the observed days of the week along corridor A.
Source: - Field Survey, 2017

Volumetric traffic count for Monday along corridor B (Western By-Pass carrying streams of traffic from Tunga, Sauka Kahuta and Barkin Sale to Kpakungu)

Figure 4.4 summarizes the traffic distribution for the observed days of the week along the corridor under study. It could be deduced from figure 4.4 that the two peaks periods were constant for all the days of the week observed. The hours of the day associated with the peak periods are from 8:01 am – 10:00 am (morning Peak) and 2:01 pm – 4:00 pm (evening peak). This, however, is in line with the reality of two peak periods of congestion. During the peak periods when traffic was intense, traffic congestion was noticed in numerous cases. Contributing factors to the congestion situation along the corridor were grocery stores and shops that are juxtaposed to each other without provision for parking resorting to roadside parking by vehicle drivers alongside petty traders who lay their commodities for sale along the shoulders of the corridors resorting to customers parking on the roadside which obstructs traffic.

The type of congestion experienced during this period is the synchronized-flow congestion characterized with significant drop in the speed of vehicles with no noticeable change in the flow rate. It was observed during the study that elementary school students plied through the corridor frequently on bicycle as a mode of transportation to their schools. This is responsible for the significant up-rise in the bicycle traffic along corridor B as compared to corridor A. This is justified by the current location of the Limawa Government Secondary School along the western by-pass.

Figure 4.5 reveals that traffic is at its highest on Monday with 29% of the entire traffic for the days observed. This, however, leads to the clogging of the corridor which often leads to terrible traffic on Monday. It could also be ascertained from the figure that traffic gradually falls progressively from the start of working days (Monday) to weekend (Saturday).

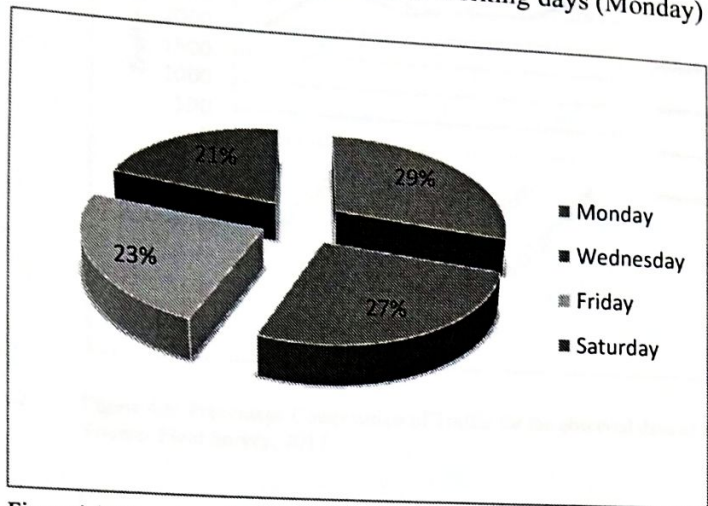


Figure 4.4: Percentage Composition of Traffic for the observed days of the week along corridor B. Source: Field Survey, 2017.

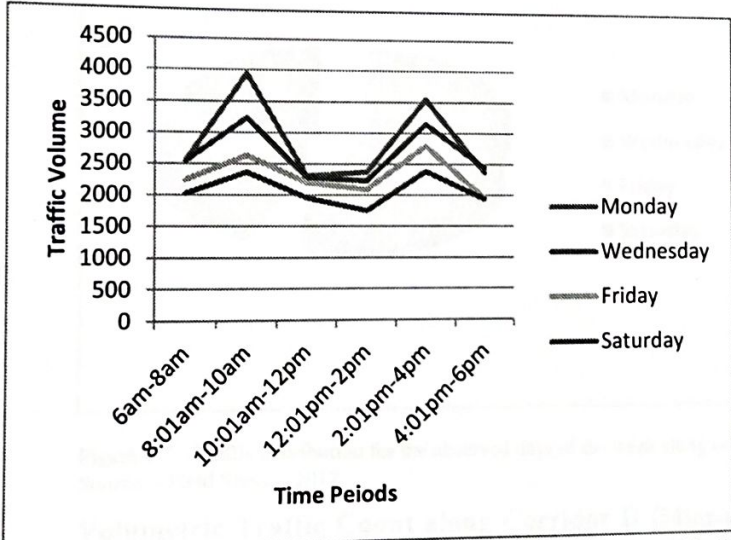


Figure 4.5: -Traffic distribution for the observed days of the week along corridor B. Source: - Field Survey, 2017

Volumetric traffic count along corridor C (Minna-Zungeru road carrying streams of traffic from Chanchaga, Tunga and Shango to Mobil)

Figure 4.6 summarizes the traffic distribution for the observed days of the week along corridor c. The most noticeable congestion problem along the study corridor was during the peak hour (between 8:01 am and 10:00 am) while coming from Chanchaga, Tunga and Shango. During the peak periods when traffic was intense, traffic congestion was experienced in numerous cases. Congestion during this period could be attributed to absence of lay-bays at the shoulders of the corridor to allow for on-street parking. Thus vehicle owners resort to parking along the road just before the cordon point which obstructs traffic. The type of congestion experienced during this period is the synchronized-flow congestion as experienced on previous corridors examined characterized with significant drop in the speed of vehicles with no noticeable change in the flow rate. It could be said from the figure that peak periods did not follow the same trend as seen in the previous corridors examined. Peak periods during the week occurred between the hours of 8:01am-10: 00 am for the morning peak, 2:01pm-4: 00 pm and 4:01pm-6: 00 pm for the evening peak.

Figure 4.7 reveals that traffic is at its highest on Monday with 29% of the entire traffic for the days observed. This, however, leads to the clogging of the corridor which often leads to terrible traffic on Monday.

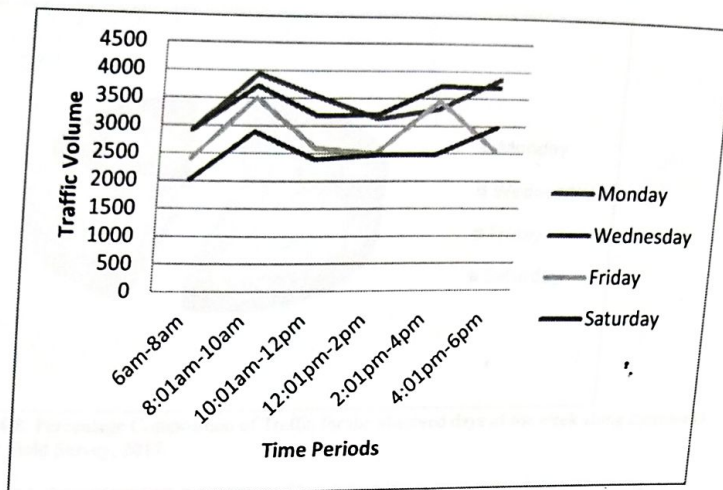


Figure 4.6: Percentage Composition of Traffic for the observed days of the week along corridor C.
Source: Field Survey, 2017

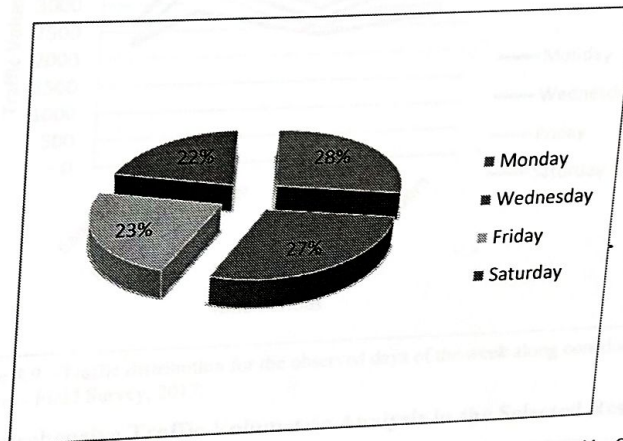


Figure 4.7: -Traffic distribution for the observed days of the week along corridor C.
Source: - Field Survey, 2017

Volumetric Traffic Count along Corridor D (Minna-Zungeru road carrying streams of traffic from Bosso, Tayi village and F-Layout to Mobil); Figure 4.8 gives a summary of the traffic distribution along corridor D during the observed days of the week. It also presents the trend in peak periods and off-peak periods. Just like in previous corridors examined, the most noticed congestion period was during the morning and evening peak hour (between 8:01 am – 10 am and 4:01 pm – 6 pm) while coming from Bosso, Tayi village and F-Layout. During the peak periods when traffic was intense, traffic congestion was experienced in numerous cases. Contributing factor to the congestion along the corridor were petty traders who lay their commodities for sale along the shoulders of the road resorting to vehicles (commercial taxis and tricycles in particular) parking on the road side which obstructs traffic. The corridor runs through the central business district of the metropolis and as such traffic is intense because of the various land uses that generates and attracts traffic within the central business district. The available right of way for traffic is very small considering the nature of traffic in the CBD and as such various transport vessels compete for the available space especially during intense traffic period.

Figure 4.9 reveals that traffic is at its highest on Monday and least on Saturday. This is justified by the fact that Monday is the first day of the week and economic activities are vibrant a case of which is different during weekends. This, however, leads to the clogging of the corridor leading to terrible traffic on Monday the case of which is different on Saturday characterized by very smooth traffic flow.

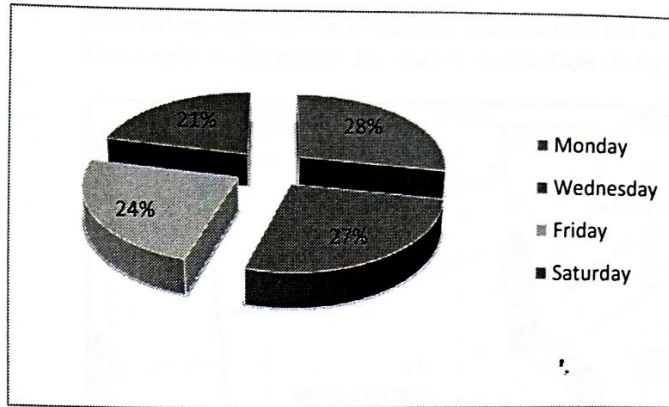


Figure 4.8: Percentage Composition of Traffic for the observed days of the week along corridor D. Source: Field Survey, 2017.

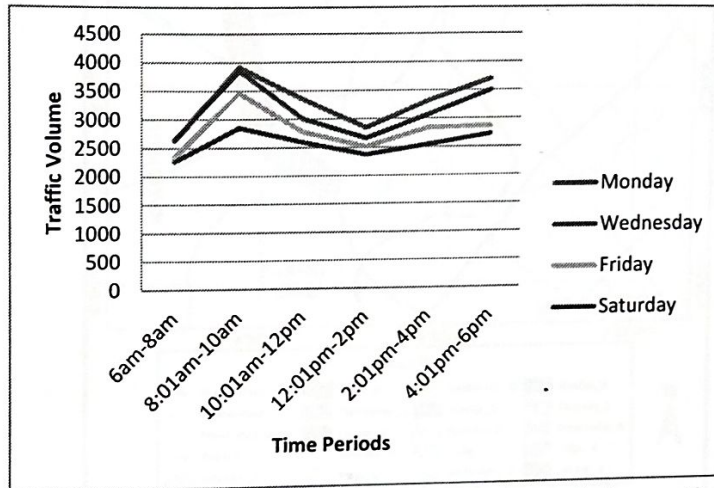


Figure 4.9: -Traffic distribution for the observed days of the week along corridor D. Source: - Field Survey, 2017.

Comprehensive Traffic Volumetric Analysis in the Selected Research Road Corridors

Days of the Week	Corridor A					Corridor B					Corridor C					Corridor D								
	C	T	B	TT	M	B	C	T	B	TT	M	B	C	T	B	TT	M	B	C	T	B	TT	M	B
Monday	6286	3263	66	56	6535	9	6374	4236	48	26	6392	10	7404	5603	90	97	7442	47	6627	5432	89	88	7494	44
Wednesday	5748	2976	35	25	5764	4	5748	4212	49	47	3806	12	7396	5668	66	67	7036	50	6394	5430	96	81	6696	37
Friday	5501	3611	46	39	5852	12	4971	4040	56	44	4772	17	6001	4608	93	60	6256	24	6042	5150	67	71	5420	43
Saturday	4227	3138	24	41	4699	3	4365	3357	35	37	4621	18	5248	4195	65	50	5679	9	5094	4802	68	61	5294	28

Legend .	
C	Cars
T	Tricycles
B	Buses
TT	Trucks/Trailers
M	Motorcycles
B	Bicycles

Source: Author's Research, 2017

Congestion Extent Experienced along Corridors Studied.

The extent of congestion was extreme during certain peak periods of the day. A composite map that shows all the extent of congestion experienced during the days of the week along the corridors studied is seen in figure 4.10. The extent of congestion for each day of the week studied along the corridor is represented by different colour tones. The direct correlation between the colour tones and the extent of congestion tells that the denser the tone, the more extreme the extent of congestion experienced. The overlapping technique in ArcGIS was used to arrive at the map composite. The congestion extent of each day of the week studied was overlapped accordingly to reveal the trend.

Figure 4.10 reveals that the extent of congestion along each of the corridors examined is extreme on Mondays. The implication of this is that there will be clogging of road corridors on Monday which will often lead to terrible traffic on Mondays. The trend falls concurrently all through the week along the corridors leaving Saturday (a weekend) with the least extent of congestion. The extent of congestion is least on Saturdays all through the corridors

This explains the reason for smooth traffic flow during weekends.

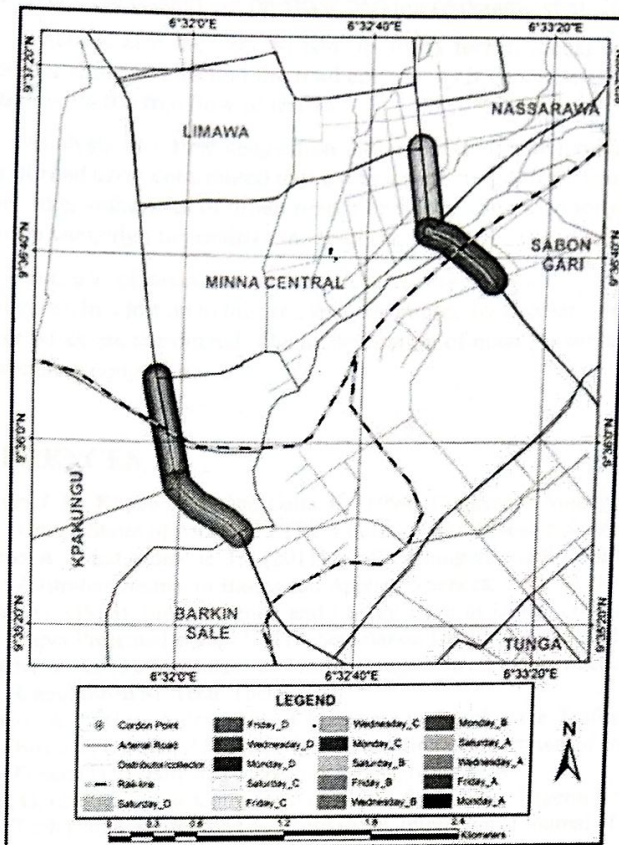


Figure 4.10: Composite Map of Extent of Congestion Experienced along Corridors Examined.
Source: Field Survey, 2017.

CONCLUSION

The conclusion for this research work is based on the research findings. Transportation is a basic tool, vital to the effectiveness and smooth running of every single human activity. Consequently, it is most appropriate that significant effort is adapted towards guaranteeing its greatest practicable usefulness (Badamasi, 2014). This study has been able to identify the nature, impact and extent of traffic congestion on urban accessibility in Minna metropolis and offered some useful suggestions on ways and means to solve these problems.

Although the congestion issues in Minna has not yet assumed the dimensions of that of larger cities like Abuja, Lagos, Ibadan and Port-Harcourt, signs of bottlenecks are already apparent. With increasing population growth and affluence, it is expected that the situation will deteriorate much sooner unless we evolve efficient traffic management for our cities, especially at traffic intersections.

Conclusively, it is quite pertinent to note that urgent attention should be focused on regulating the traffic situation in these selected corridors in order to attain sustainable urban transportation in the City.

Recommendations

Traffic congestion problems are huge impediments to the free flow of traffic. These problems are caused by the growth in the number of vehicles on the roads, occasioned by population growth, as well as ineffective use of the road spaces (Aderamo et al., 2011). In lieu of the research findings, the following recommendations have been proposed in order to effectively deal with the problems of traffic congestion in the study area:

1. The narrowness of the corridors do not give ample space for side-kerb parking and due to the absence of a provision for off-street parking, drivers resort to parking on the streets, thereby, further constricting the already narrow carriageway. It is therefore

recommended that the expansion of the carriageway, the provision of off-street parking facilities as well as the installation of NO PARKING and NO WAITING signs strategically, will alleviate the problem of on-street parking (Aderamo et al, 2011).

2. There is also the need to ban, in all its forms, illegal commercial activities being carried out along and around the road corridor as it generally constitutes a nuisance and an impediment to the free flow of traffic.

3. Analysis of traffic congestion along the study corridors revealed that poor driving habits of road users contributed to the menace of congestion experienced along the corridor. On this note, authorities of urban road transport in the metropolis should embark on regular education campaign to sensitize the road users on effective utilization of roads.

4. The use of mass transit has an advantage in moving more people than cars and motorcycles. In addition to this, the space occupied by smaller vehicles will be well reduced, if larger buses are patronized. The incorporation of mass transit lanes on highways will also help in easing congestion.

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**FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA**



**SCHOOL OF ENVIRONMENTAL TECHNOLOGY
INTERNATIONAL CONFERENCE (SETIC 2016)**

SETIC 2016 *Conference Proceedings*

EDITORS:

Yekeen A. SANUSI
Olatunde F. ADEDAYO
Richard A. JIMOH
Luqman O. OYEWOBI

THEME:

**SUSTAINABLE BUILT ENVIRONMENT
AND CLIMATE CHANGE:
THE CHALLENGE OF POST 2015
DEVELOPMENT AGENDA**

DATE:
**TUE. 10TH - THUR. 12TH
MAY, 2016**

VENUE:
**SCHOOL OF ENVIRONMENTAL
TECHNOLOGY COMPLEX**

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**9:00AM - 5:00PM
DAILY**

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PROF M. A. AKANJI
VICE CHANCELLOR, FEDERAL UNIVERSITY
OF TECHNOLOGY, MINNA

HOST:
PROF Y. A. SANUSI
DEAN, SCHOOL OF ENVIRONMENTAL TECHNOLOGY,
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Federal University of Technology Minna,
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Conference Proceedings

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Conference (SETIC) 2016

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10th – 12th May 2016
School of Environmental Technology,
Federal University of Technology, Minna, Niger State, Nigeria.

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The following members of the 1st School of Environmental Technology (SETIC) and
Faculty of Environmental Engineering, Federal University of Technology, Akoka, Lagos
State, Nigeria, organized the SETIC 2016 Conference.

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The SETIC 2016 Conference was held at the Federal University of Technology, Akoka, Lagos State, Nigeria, from 14th to 16th September 2016. The conference was a great success and we are grateful to all the participants, sponsors, and staff who made it possible. We hope you enjoy your stay at our conference, and that you have the opportunity to
network, learn and share knowledge, as well as participate in productive discussions with
the best minds in your field and practitioners in the local environment and industry.

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Dr. Oluwole D. Oyedun
Dr. Oluwole D. Oyedun
Dr. Oluwole D. Oyedun
Dr. Oluwole D. Oyedun
Dr. Oluwole D. Oyedun

FOREWORD

The organising committee of the 1st School of Environmental Technology International Conference is pleased to welcome you to Federal University of Technology Minna, Niger State Nigeria.

The conference provides an international forum for researchers and professionals in the built and allied professions to address fundamental problems, challenges and prospects that affect the Built Environment as it relates to Climate Change and Sustainable Development. The conference is a platform where recognised best practices, theories and concepts are shared and discussed amongst academics, practitioners and researchers. The papers and scope are quite broad but have been organised around the sub-themes listed below:

- Infrastructure Development and Financing
- Sustainable Practice Theories
- Urban Resilience and Energy Conservation
- Waste Management and Sanitation
- Health and Safety Issues
- Climate Change and Threat to Sustainability of the Built Environment
- Climate Change Induced Disaster
- Designing the Human Settlement for Climate Change
- Conceptual Issues on Climate Change and Sustainable Development
- Sustainable Materials
- Cross Cutting Issues

The peer review process saw us making use of 48 senior academics and specialist as reviewers drawn from institutions in Nigeria and England. There were some papers were outside the theme of the conference but we had to create a cross cutting issues to accommodate such papers this is in spirit that every knowledge is important.

We hope you enjoy your time at our conference, and that you have the opportunities to exchange ideas and share knowledge, as well as participate in productive discussions with the like-minded researchers and practitioners in the built environment and academia.

Professor Yekeen Adeeyo Sanusi
Conference Chair
School of Environmental Technology International (SETIC) 2016
Federal University of Technology Minna, Niger State Nigeria.
May 2016

FOREWORD

The organising committee of the 1st School of Environmental Technology International Conference is pleased to welcome you to Federal University of Technology Minna, Niger State Nigeria.

The conference provides an international forum for researchers and professionals in the built and allied professions to address fundamental problems, challenges and prospects that affect the Built Environment as it relates to Climate Change and Sustainable Development. The conference is a platform where recognised best practices, theories and concepts are shared and discussed amongst academics, practitioners and researchers. The papers and scope are quite broad but have been organised around the sub-themes listed below:

- Infrastructure Development and Financing
- Sustainable Practice Theories
- Urban Resilience and Energy Conservation
- Waste Management and Sanitation
- Health and Safety Issues
- Climate Change and Threat to Sustainability of the Built Environment
- Climate Change Induced Disaster
- Designing the Human Settlement for Climate Change
- Conceptual Issues on Climate Change and Sustainable Development
- Sustainable Materials
- Cross Cutting Issues

The peer review process saw us making use of 48 senior academics and specialist as reviewers drawn from institutions in Nigeria and England. There were some papers were outside the theme of the conference but we had to create a cross cutting issues to accommodate such papers this is in spirit that every knowledge is important.

We hope you enjoy your time at our conference, and that you have the opportunities to exchange ideas and share knowledge, as well as participate in productive discussions with the like-minded researchers and practitioners in the built environment and academia.

Professor Yekeen Adeeyo Sanusi

Conference Chair

School of Environmental Technology International (SETIC) 2016

Federal University of Technology Minna, Niger State Nigeria.

May 2016

ACKNOWLEDGEMENTS

The success of the 1st School of Environmental Technology International Conference holding at the Main Campus of the Federal University of Technology Minna, Nigeria is predicated on the support and goodwill from Vice-Chancellor of Federal University of Technology and many other highly motivated people.

I sincerely wish to appreciate you for attending this maiden event and to warmly welcome you to the city of Minna the capital of the *POWER STATE*. It is a great honour to have you in the beautiful campus of Federal University of Technology Minna, Nigeria, **THE MOST PEACEFUL UNIVERSITY IN NIGERIA**. I am aware of the great sacrifices made by many of you to be present in this occasion and I will definitely not overlook the long distances some of you have had to cover to get to this conference venue. We genuinely appreciate all your efforts. It is our singular hope and desire that the conference meets your expectations and gives you unquantifiable experience and tremendous developmental networking opportunities for a life fulfilling career.

We are grateful for the presence of the Vice Chancellor of the Federal University of Technology Minna – Professor Musbau Adewumi Akanji whose leadership and distinguished academic career has served as inspiration and encouragement to many young academics. His desire to see the University compete at International level has led to the upsurge in the organisation of International conferences, Public lectures and Seminars on regular basis within and outside the university. We are happy to have you as the Chief host to declare the conference open and deliver the welcome address.

We are grateful to the Dean of School of Environmental Technology, Federal University of Technology Professor Yekeen Adeeyo Sanusi for providing the robust platform, academic support and leadership for the organisation of the conference. You threw the challenge and provided the required resources and strategies for achieving its success, it is a great honour of having the opportunity to learn at your feet. We are happy to have you as the host and keynote speaker at the conference. I wish to thank also all the special guests particularly leaders of the Industry, Built Environment and Academia.

SETIC is beginning at the foundation this year and for this I wish to thank all those who have supported us through various forms of participation. Specifically I wish to thank the delegates and the partners for contributing significantly to the conferences. I wish to thank Prof. Oluwole O. Morenikeji (DVC Academic), Prof. Stella N. Zubairu and Prof. A. M. Jinadu who genuinely and consistently monitored the progress of the conference preparations. It is my desire that SETIC becomes a constant feature in the calendar of the university and global conference listings.

Delegates to SETIC 2016 are from 39 different academic and research institutions that are spread across six different countries. This offers participants a wonderful opportunity for exchange of cultural, social and academic ideas during the conference periods. It is also an opportunity to create awareness about programmes and events at the participants' individual institutions. I encourage you all to make good use of the networking opportunities that are available.

We received a total of 226 abstract, based on a quick review we were able to accept 175 of them and the authors were communicated on what they needed to focus on while developing the full papers. A total of (129) full papers were received and reviewed, the reviewers report for the authors to make corrections and submit revised papers. It was after the process that we were able to accept 112 papers for presentation at the conference, I therefore congratulate all the authors whose papers made it to the conference. We acknowledge the amount of hard work you had all put in producing these papers. It is my sincere believe that the presentation of the different ideas in your paper would go a long way in improving the knowledge of the participants and also generate meaningful discussions at the tea beaks, lunch and beyond.

I wish to express my utmost gratitude to each reviewer for a wonderful job done and for tolerating our deadlines and Oliver Twist syndrome. It is your dedication and expertise that has ensured that the conference is a success.

Special thanks to all our keynote speakers, Prof. Oluwole O. Morenikeji (Deputy Vice-Chancellor Academics, Federal University of Technology Minna), Prof. Hussein Makun (Director, Directorate of Research Innovation and Development, Federal University of Technology Minna), Prof. Musa Aibinu (Director, Centre for Distance Learning), Prof. Mustapha Zubairu (Director, Centre for Human Settlement and Urban Development), Dr. Appolonia A. Okhimamhe (Director, WASCAL) and Prof. Yekeen Sanusi, (Dean School of Environmental Technology, Federal University of Technology Minna).

It is important to appreciate the roles and efforts of the following people for their selfless and very significant contributions made towards the successful organization of the conference: Adedokun John, Idowu Oqua, Akhabue Oriwoh and Ailoyafen Dorcas (for being available to run around at very short notice), Arc. Oyetola Stephen and Tpl Samuel Medayese (for typesetting the papers for the conference proceedings).

I have come to realise that it is not easy to organize conference without dedicated individuals offering to serve. My heartfelt gratitude goes to Dr. R.A. Jimoh, Dr. L.O. Oyewobi, Dr. Taibat Lawanson, Dr. P. Ayuba, Dr. J.J. Dukiya, Dr. A.I. Anunobi, Dr. N.I. Popoola and Dr. O.A. Kemiki for their unflinching support all through the process.

It is our sincere hope that this conference will serve as a forum for the advancement of research in the urban sphere towards achieving a sustainable environment. It is our sincere believe that academics and professionals in practices will continually participate in this forum.

Once again I wish to thank you all for creating time out of your busy schedule to attend this conference. Please do enjoy your stay at Federal University of Technology Minna, and the city as a whole. Ensure that you make use of the different fora created throughout the conference to build new relationships for the future and strengthen existing relationships. I look forward to seeing you all in future.

Olatunde Folaranmi ADEDAYO
Chairman SETIC 2016 Organising Committee
May 2016

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ASSESSMENT OF INSECURITY CHALLENGES IN NYANYA AREA OF ABUJA, NIGERIA

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Insecurity is a major phenomenon plaguing many regions in Nigeria. However, the situation is more intensified in the northern part of the country where Boko-Haram insurgency has thrived unabated. Insecurity is not only caused by a single factor but a combination of factors such as armed robbery, burglary (house and shops), terrorism, cult activities, among others. The aim of this study is to assess the incidence of insecurity and its effect on residents of Nyanya, Abuja. Nyanya has 40232 households, 10% of the households population were used to carry out this study using multi-stage systematic random sampling method Nyanya was divided into six (6) neighbourhoods and questionnaire were distributed according to the number of household in the neighbourhood. The study discovered that Nyanya has 51.4% of armed robbery occurrence on monthly basis, 41.2% incidence of shop burglary on daily basis, 30.4% incidence of house burglary on weekly basis, 55.8% cases of false pretence on daily basis and 51.4% occurrences of unlawful possession on daily basis; and these crimes are mostly caused by unemployment and under-employment, poverty, low and lack of formal education, lesser penalty for offenders, lack of parental care, peer pressure, poor social amenities among others. However, as risen the level of insecurity and fear in Nyanya from 30.6% in 2013 to 67.4% in 2015. In view of these, many crime prevention measures have been taken by the residents and the government among which are effective police patrol, several military check points, and restriction of movement. The research therefore recommended that Government should strengthen its security forces in areas like the Nyanya village, Nyanya market area and Mararaba junctions respectively to reduce the level of crime occurrence and there should be a joint security service between the government security and the resident's security providers to help contain crime activities in the area.

Keywords: Insecurity, Security, Crime, Safety, Fear, Terrorism.

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INTRODUCTION

Insecurity can be seen as a situation where the life and property of citizens in a particular country or a society is not adequately protected (Online Dictionary, 2015). The word security emanated from the Greek word *Se-Cura*, meaning "to be in a state of no fear". This state of being free from any threat within or without underscores the importance of putting in place actions and structures that can ensure the shelving of a people away from any harm. There is no doubt that security has been a subject that has attracted a rapidly growing interest and concern among the scholars in social sciences whereby a wide spectrum of issues on the subject – security have been studied and new breakthroughs and findings have been made. The experience of the world in recent times emphasise a paradigm shift in security discourse. Any internal or external threat challenging the authority of the State in monopolising violence was considered as a security threat (Worcester, 2015). Fear, on the other hand, is a strong uncontrollable, unpleasant emotion caused by actual or perceived danger or threat (British Dictionary, 2015).

Nigeria, no doubt is an inimitable country where thousands of people who are multi-ethnic, multi-cultural and multi-religious co-exist. However, competition for the control of socio-political and economic authorities among the various ethnic groups has led to series of violence and civil unrests (Ojo and Ayesoro, 2013). The problem of insecurity is not only a sectional or a regional problem rather it has become a global phenomenon that has attracted the attention of every stakeholder in the world today (Michael, 2008). However, poor urban planning, design and management play a significant role in shaping of urban environments that put citizens and property at risk (Akukwe, 2013). The dangerous dimension of the insecurity challenge has become a great source of worry to security experts as they have predicted that, what is on ground has shifted to the realm of terrorism, a global phenomenon where no one is safe (Haruna, 2012). It is regrettable, however, that the security organizations have failed to tackle the challenges, even as they have become the target of terrorists who have never hidden their disdain for the intelligence and law enforcement community (Alozieuwa, 2012).

In Nigeria however, the most pronounced terrorist activities are the Niger Delta militants and the dreaded Islamic extremist group popularly known as the Boko Haram which have its official name as *Jama' atu Ahlis Sunna, Lidda' await Wal-Jihad*. This literally means "people committed to the propagation of the prophet's teachings and Jihad", with the goal of maiming activities in the north-eastern part of the Nigeria living some other parts of the country with terrorist activities such as kidnapping, armed robbery, and many others. These have introduced fears among the populace of the country (Bello, 2012).

Nyanya is a satellite town in the FCT it is known for its high commercial activity and this has attracted population to the area; this has in turn caused crime such as theft, armed robbery, prostitution, and other social delinquencies are common found in the area. The most pronounced incident that occurred is the twin bombing of the motor park that took place on 1st and 14th April 2014 that led to the death of 94 persons according to This day online news

of April (2014). However, the insecurity challenge facing the north-eastern part of the country in recent times has triggered the movement of people into the town thereby making the town congested.

In the discourse of security in Nigeria, Okorie (2011), Jega (2002), Salawu (2010), Onyishi (2011), Ezeoha (2011), Lewis (2002), have identified several causes of security crisis in Nigeria that pose serious consequences to national development. Highest among them is ethno-religious conflicts that tend to have claim many lives in Nigeria.

STATEMENT OF PROBLEM

Abuja metropolis was designed to accommodate a total population of about 3 million by the year 2010 and a maximum population of 4million well into the 21st century in 2012 the population of Abuja was 2,245,000 (NPC 2012) but today, Abuja have a population of Abuja today is over 5millinon people with over 3million commuters that come into the city on daily basis. This growth has adversely affected the study area in the aspect of spill over population (Abuja Today Online, 2015).

Rapid urbanization is said to have led to the twin bomb blast that was later claimed to be perpetuated by the dreaded Islamic sect (BOKO HARAM) who took the advantage of the motor park located along the Abuja Keffi road these act led to loss of lives and properties. This is in consonance with the view of Ojo and Ayesoro (2013) who argued that uncontrolled urbanisation has the proclivity of security challenges. This has however possess fear amongst the dweller of Nyanya and also to the socio-economic activities of the satellite town and has also threatened the mutual co-existence of the inhabitants of Nyanya. Also as a result of these blasts, traffic congestion has increase making the journey of 10 minutes the journey of hours.

AIM AND OBJEVTIVES

The aim of this study is to assess the Challenges of insecurity in Nyanya Abuja. The main objectives of this study are to:

- I. Identify areas within Nyanya that are presently facing high security challenges;
- II. Examine the efficiency of the security agencies responsible for maintaining a secured environment;
- III. Appraise the effect of insecurity on the socio-economic activities of residents of Nyanya Abuja; and Evaluate the role of residents in managing security challenges

LITERATURE REVIEW

The present study relies heavily on the theory of social disorganisation. The theory was formulated by Shaw and McKay in 1942, following a research conducted in Chicago to

examine the location of security threatening factors in the residential areas in the city (Shaw and McKay, 1942; Seepersad, 2010; Ojo and Ayesoro, 2013), believing 'that an ecological theory of social disorganization could explain the patterns of criminality' (Lewis, 1996). By using maps to carry out 'crime mapping', Shaw and McKay (1942) noted that the distribution and rate of crime did not owe origin spatio-temporal factors in the city. The theory posit that crime occurs more in 'particular areas of the city, and importantly, remained relatively stable within different areas despite continual changes in the populations who lived in each area' (Ojo and Ayesoro, 2013; Seepersad, 2010). In areas of the city where crime persists, for example, the rates of crime continue to be comparatively high irrespective of which racial or ethnic group are the dominant residents of that area at that particular time, with a corresponding decrease in the rate of crime as the residents migrate to areas with low rate of crime (Ojo and Ayesoro, 2013; Lewis, 1996). These observations led Shaw and McKay to the conclusion that crime was likely a function of neighbourhood dynamics, and not necessarily a function of the individuals within neighbourhoods (Seepersad, 2010).

Shaw and McKay (1942) also noted that, aside from the lack of behavioral regulation, socially disorganized neighborhoods tended to produce "criminal traditions" that could be passed to successive generations of youths. This system of pro-delinquency attitudes could be easily learned by youths through their daily contact with older juveniles. Thus, a neighborhood characterized by social disorganization provides fertile soil for crime and delinquency in two ways: through a lack of behavioral control mechanisms and through the cultural transmission of delinquent values (cited in Seepersad, 2010). The present study adopts this theory in order to justify the assertions of social disorganization theory in the Nigerian context. This follows the standpoint of Ojo and Ayesoro (2013) who noted that this theory is of immense relevance to the success of any study that deals with the issues of security threats in the urban areas.

MICRO-SOCIAL THEORIES OF AND EXPLANATIONS OF INSECURITY

The micro-social theory of security threat is one of the many theories developed to explain the reason behind people's violent actions. One of the main developers of this theory is Collins (2007). The theory specializes in explaining violent situations in general, as opposed to the generasly practiced approach which takes an individualistic approach to explaining violence (Collins, 2007). He argued that in trying to explain violence, it is important to "seek the contours of situations, which shape the emotions and acts of the individuals who step inside them" stressing that "it is a false lead to look for types of violent individuals, constant across situations". Hence, in the opinion of this theory, though violence is an attribute of young men, not all young men are violent; but that middle-aged men, children, and women are violent too. However, though poverty, marginalization, divorce or separated parents, and so on, in the appropriate situations, are major causes violence (Collins, 2004; Collins, 2007; Ojo and Ayesoro, 2013), this may not Always be the case (Collins, 2007).

Summarily, this theory posits that in an attempt to proffer countermeasures to violence, there are at least three methods for getting at situational details of violent interactions: recordings (where violent scenes are mentally recorded and written), reconstructions (where a thorough situational analysis is carried out through analyzing prevailing and historical events), and observations (through a sociological, psychological and economic in-depth study); and these "are most useful when used in combination" (Ojo and Ayesoro, 2013; Collins, 2007).

INSECURITY IN NIGERIAN CONTEXT

Nigeria in recent times has witnessed an unprecedented level of insecurity. This has made national security threat to be a major issue for the government and has prompted huge allocation of the national budget to security (Achumba, et al 2013). Consequently, Azazi, (2011) observed that in order to ameliorate the incidence of crime, the federal government has embarked on criminalization of terrorism by passing the Anti-Terrorism Act in 2011, installation of Computer-based Closed Circuit Television cameras (CCTV) in some parts of the country, to enhance surveillance as well as investigation of criminal related offences, heightening the physical security measures around the country, which is aimed at deterring or disrupting potential attacks, strengthening of security agencies through the provision of security facilities, the development and broadcast of security tips in mass media. Despite these efforts, the level of insecurity in the country is still high. To corroborate this assertion, GPI (2012) has stated that Nigeria has consistently ranked low in the Global Peace Index, signifying a worsened state of insecurity in the country. Hence, Adagba, et al (2012), Uhumwuangho and Aluforo (2011) argued that the efforts of government have not yielded enough positive result.

RESEARCH METHODOLOGY

This study covered six (6) neighbourhoods in Nyanya Abuja namely: Nyanya Area 'A', Nyanya Area 'B', Nyanya Area 'C', Nyanya Area 'D', Nyanya Area 'E', and Nyanya Village. This research adopts a cross sectional research design method this type of research design is confined in a particular place at specific point in time. Cross sectional surveys are studies aimed at determining the frequency (or level) of a particular attribute, such as Specific exposure, disease, or the effect of a phenomenon in a defined population at a particular point in time (Wikipedia, 2015). Similarly, a cross-sectional research is an observational one. This means that researchers record information about their subjects without manipulating the environment (Winter, 2009). In line with the above definitions, this research begin with reconnaissance survey of the study area, data collected from the civil defence corps and police on areas that has attracted high level of policing, personal interview was carried out on some of the residents on their perception on the problem of insecurity in the area, GPS reading (coordinate) was taken from the areas identify as criminal hideout and the blast scene of April 1 and 14 2014.

In carrying out this research work, the multi stage systematic random sampling method was adopted to sample 138 households in the study area for the research. This sampling method was used to eliminate subjectivity and impact in the research by giving every member in the

surveyed population an equal probability of an individual in the sample to be selected (Singh, 2006 and Kothari, 2004). The data collected were analysed in descriptive terms, following the fact that security challenges are recurrent in the study area.

DATA ANALYSIS AND PRESENTATION OF RESULTS

This assessment was carried out to know the street in the study area. The survey that was carried out shows that Area 'A' have 14.5% of respondents, Area 'B' have 21.0% respondents, Area 'C' have 14.5% respondents, Area 'D' have 6.5% respondents, Area 'E' have 36.2% respondents and Nyanya village have 7.2% respondents. See figure 4.10.

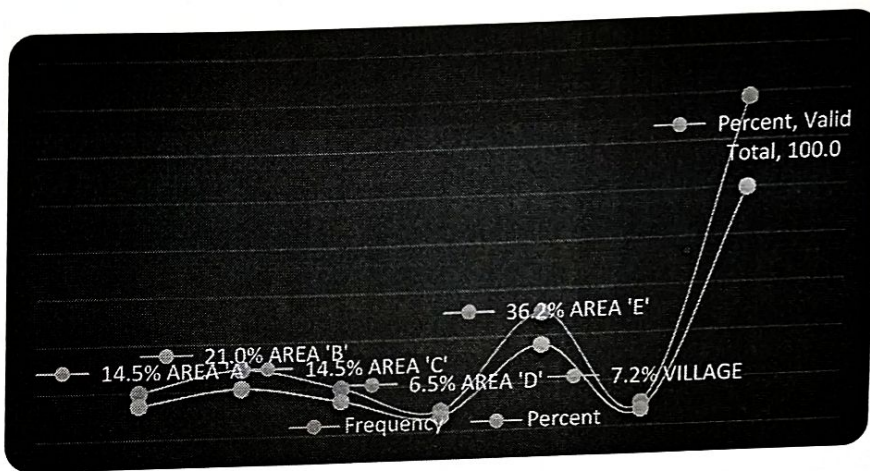


Figure. 4.1 Street Name of Respondents
Source: Field survey 2015.

This assessment in figure 4.2 was carried out to be able to determine the Areas that is highly faced with security challenge. It was discovered 15.2% of the areas are highly faced with insecurity, 60.9% are moderately faced with insecurity, 19.6% are merely challenge and 4.3% are not faced with any security challenge.

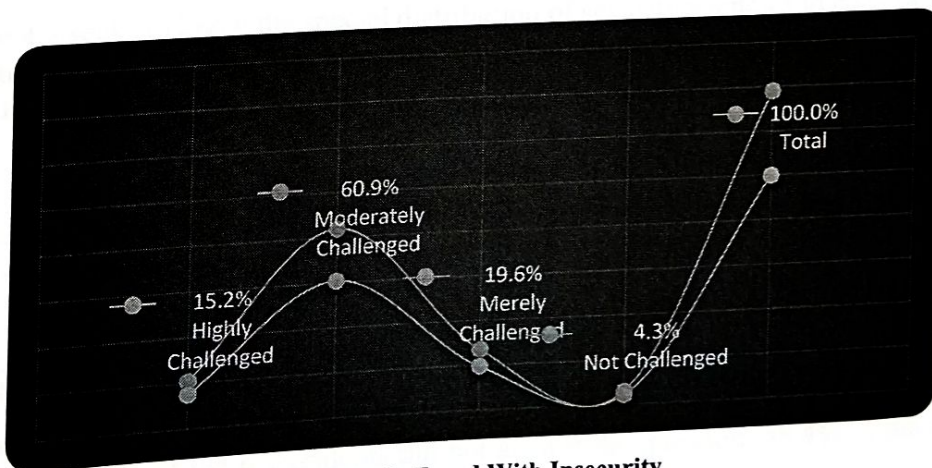


Figure. 4.2 Streets That Are Highly Faced With Insecurity
Source: Field survey 2015.

Figure. 4.3 shows the assessment was done in order to know the level of security in the study area. The study discovered that 18.1% of the respondent are feeling highly secured, 47.8% are having a feeling that they are moderately secured while 23.9% are merely secured and 10.1% are not secured.

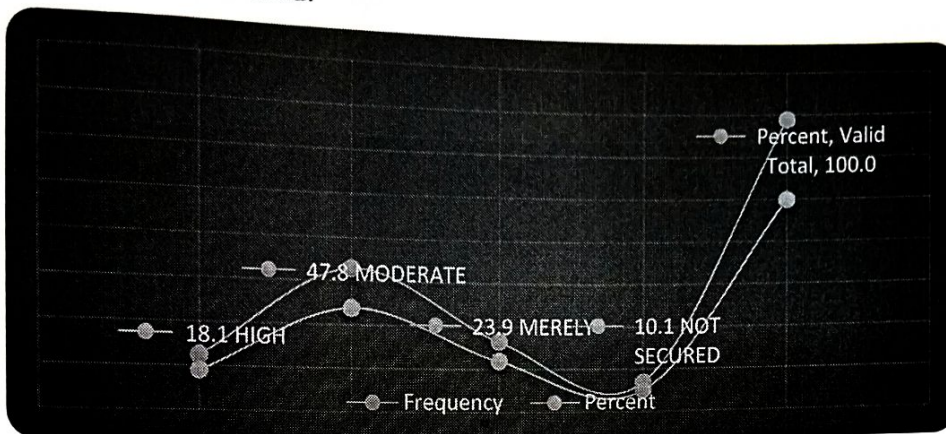


Figure. 4.3 Level of security
Source: Field survey 2015.

This was asked bring the research to the limelight of the security providers in the study area. The research find out that 48.6% of securitization is provided by the government, 23.9% is provided by private individuals while 21.0% is provided by the community (vigilante group) and 6.5% did not choose any of the aforementioned options (Table 4.1).

Table 4.1 Security Providers

Security Providers	Respondents	Percent
Government	67	48.6
Individual	33	23.9
Community	29	21.0
None Of The Above	9	6.5
Total	138	100.0

Source: Field survey 2015.

Table 4.2 seeks to know the special distribution of security agencies in each of the phases in the study area. The result of the survey carried out shows that 55.8% of the respondents have a police post or any other security post in there street while 44.2% of the respondents do not have.

Table 4.2 Spatial Distribution of Security Agencies

Options	Respondents	Percent
Yes	77	55.8
No	61	44.2
Total	138	100.0

Source: Field survey 2015.

Table 4.3 below, sought to know the level of patrol in the study area. The surveyed result shows that 2.9% of the respondents did not answer the question, 38.4% of the respondents

answer was that they see them daily, 13.0% see the patrol team weekly, 5.1% see them monthly and 40.6% only see them when there is information about crime.

Table 4.3 Level of Patrol

Level of Patrol	Respondents	Percent
Not Answered	4	2.9
Daily	53	38.4
Weekly	18	13.0
Monthly	7	5.1
Only When There Is Information About Crime	56	40.6
Total	138	100.0

Source: Field survey 2015.

The rate of murder occurrence in the study area was assessed so as to avail the research the opportunity to ascertain the level of fear. The surveyed data reveals that 3.6% of the respondent said the crime occur on daily basis while 8.0% experience murder on weekly basis in the study area, 9.4% experience murder on monthly basis and 79.0 experiences murder on yearly basis. Table 4.4.

Table 4.4 Level of Murder Occurrence

Level of Occurrence	Respondents	Percent
Daily	5	3.6
Weekly	11	8.0
Monthly	13	9.4
Yearly	109	79.0
Total	138	100.0

Source: field survey 2015

SUMMARY OF FINDINGS

It can be summarized from the data collected and analysed that Area 'E' is presently faced with high security challenge with 36.2% level of insecurity compare to other neighborhoods like Area 'A', 'B', 'C', and 'D' who have 14.5%, 21.0%, 14.5%, 6.5% and level of insecurity challenge. It was also deduced that 15.2% of the respondents who are highly challenged lives around Nyanya market, Nyanya village, Mararaba gate areas respectively this is because these areas are densely populated and can also be characterized by busy commercial activities while areas that are moderately challenged with 60.9% stay in area 'A' 'B', 'C' and 'D' whereas, 19.6% that are merely challenged lives around Mobile police Barracks and Nyanya labour camp respectively. However, areas that are highly secured are Nyanya Mopol Barracks area, with 18.1% while areas that are moderately secured are the Nyanya labour camp of Area 'A', Area 'B', C and D with 47.8% moderate security level. Mararaba gate, Nyanya village and the Market Area are having 23.9%, and 10.1% which makes these areas merely secured. The research finds out that both private individuals and government agencies forms the largest security providers in the study area with 48.6% and 23.9% security proving research findings also discovered that the spatial distribution of security agencies is done at 55.8% yet the residents still feel the sense of insecurity.

The effectiveness of policing in the study area is at 44.2% level of efficiency while the vigilante group has 39.9% level of effectiveness. It was noticed that street gates are not effective in the study area but human guard/watch man constitutes 28.3% level of effectiveness, more so, road bumps are have 51.4% level of ineffectiveness and security/guard dogs has 37.7% level of ineffectiveness with 30.4 level of effectiveness. It was also gathered that neighborhood security alarm also have an ineffectiveness level of 49.3% and 24.6% level of effectiveness while street light have low level of ineffectiveness of 17.4% and 37.5% level of effectiveness. The research also find out that military personnel provides 41.3% security in Nyanya. Consequently, the use of surveillance cameras are not effective in the study area the level of the ineffectiveness is 69.6% warning signs/ caution signs are also not effective with 56.5% level of ineffectiveness, but findings also came up with 44.2% check point effectiveness.

CONCLUSION

In conclusion, the major effect of insecurity in Nyanya Abuja, presents its self in three dimensions these dimensions can be highlighted to be; rapid urbanization which is the major cause of insecurity in the study area, as well as poverty/ low economic status, lack of parental care, social class among others if carefully taken care of will lead to a reoccurrence of bomb blast in the study area

RECOMMENDATIONS

The research has shown that there is a geometric increase in the level of insecurity and fear from 32.6% in year 2013 to 67.4% in year 2015. In view of this, the research recommends the following planning measures to curbing insecurity in Nyaya:

- I. Government should strengthen its security forces in areas like the Nyanya village, Nyanya market area and Mararaba junctions respectively to reduce the level of crime occurrence in those areas.
- II. There should be a joint security service between the government security and the resident's security providers to help contain crime activities in the area.

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**CONTEMPORARY ISSUES
AND SUSTAINABLE PRACTICES
IN THE BUILT ENVIRONMENT**

EDITORS:

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Olatunde F. ADEDAYO
Richard A. JIMOH
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CONFERENCE PROCEEDINGS

Volume 2

Editors

**Asimiyu M. JUNAID,
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Conference Proceedings of the School of Environmental Technology International Conference (SETIC) 2018

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FOREWORD

The organising committee of the 2nd School of Environmental Technology International Conference is pleased to welcome you to Federal University of Technology Minna, Niger State Nigeria.

The conference provides an international forum for researchers and professionals in the built and allied professions to address fundamental problems, challenges and prospects that affect the Built Environment as it relates to Contemporary Issues and Sustainable Practices in the Built Environment. The conference is a platform where recognised best practices, theories and concepts are shared and discussed amongst academics, practitioners and researchers. The scope and papers are quite broad but have been organised around the sub-themes listed below:

- Architectural Education and ICT
- Building Information Modeling
- Construction Ethics
- Energy efficiency and Conservation
- Environmental Conservation
- Facility Management
- Green Construction and Efficiency
- Health and Safety Issues
- Information Technology and Building Maintenance
- Information Technology and Construction
- Information Technology and Design
- Innovative Infrastructure Development
- Resilient Housing Development
- Smart Cities Development
- Social Integration in Cities
- Sustainable Building Materials Development
- Sustainable City Growth
- Sustainable Cost Management
- Sustainable Property Taxation
- Sustainable Architectural Design
- Sustainable Urban Transportation Systems
- Theory and Practices for Cost Effectiveness in Construction Industry
- Urban Ecology Management
- Urban Land Access
- Disasters, Resilient Cities and Business Continuity

We hope you enjoy your time at our conference, and that you have the opportunities to exchange ideas and share knowledge, as well as participate in productive discussions with the like-minded researchers and practitioners in the built environment and academia.

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SPATIAL ANALYSIS OF ON-STREET PARKING IN KPAKUNGU AREA OF MINNA, NIGERIA

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On-street parking overtime has taken a spatial dimension and become widespread in most urban areas of Nigeria, increase the time taken to places of work, homes and playing areas, invariably affecting the economic time at the larger scale. This research, therefore, aims at analyzing the spatial dimension of on-street parking and its economic impact on the primary Appian along Minna-Kpakungu-Bida area of Niger State. The research adopted both empirical and survey research design in order to achieve the aim of the research work. The empirical data were obtained using a structured questionnaire, while, a comprehensive on-street parking count at various hourly intervals between 8 am and 6 pm was carried out. The researcher observed that various peak and off-peak periods existing in terms of on-street parking in the survey area. The first peak period is found to be between 9 am, and 11 am in the morning which signifies the rush-hour traffic and parking first noticed in the daytime, another peak period was observed between 12 mid-day and 2 pm and the third peak between 6 pm and 8 pm. Furthermore, the research showed that the continuous on-street parking in this area has continued to affect the economic prosperity of residents around this area. While some residents agreed that most of the on-street parkers have come for one form of business or the other, others opined that such parking has continuously affected trading and commercial activities in these traffic zone. The researchers therefore, recommended an immediate relocation of all the motor parks along this traffic zone and enacted laws regulating on-street parking along this traffic zone. In conclusion, therefore, a concerted effort is required to urgently mitigate the negative economic impact of this scenario of on-street parking in the area.

Keywords: *On-street Parking, Traffic Zone, Appian, Economic Impact; Urban area*

INTRODUCTION

An integral part of the transport system which plays a crucial role in the management of traffic and congestion is parking (Allison, 2002). The urban growth in terms of population increase and the spatial expansion of the urban centers which come along with the increase in car ownership and increase in demand for movement for employment, leisure, education and other urban activities (Osoba, 2012). Accordingly, some cities cannot cope with the massive growth in the number of people due to urban activities, especially at the urban centers. The situation is getting worse with the growing population of visitors due to urban revitalization, suburban development and the increasing trend of mobility which makes parking situation more challenging. Therefore, parking is increasingly given attention as an important element of transportation planning (Jeffery, 2007).

Parking is a critical component of transportation policy and management for any place. The policies and management practices affecting parking lead to outcomes that can affect land use, air quality, traffic congestion, travel behavior, safety and economic development. For instance, policies that provide a large amount of on-street parking may encourage automobile use, therefore increasing congestion (Allison, 2002). As important as parking is, there are relatively few serious analyses and assessments of parking and even fewer of on-street parking.

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The interplay between on-street parking and other objectives such as land use or economic developments is not well understood, policies are sometimes misguided and opportunities are missed to utilize parking in ways that could have positive impacts. Parking is one of the experiences that people have when traveling and it plays an important role in traffic management and traffic congestion as it is generally recognized that city centers depend on a rapid turnover of parking to meet the demand for a short-stay visit (Asiyanbola and Akinpelu, 2012). Parking and traffic congestion are synonymous with each other because failure to meet parking demand of the people in a city leads to on-street parking that results in traffic congestion. It plays a crucial role in the management of traffic and traffic congestion (Allison, 2002). On-street parking forms one major problem that makes traffic conditions chaotic in Nigerian cities (Asiyanbola and Akinpelu 2012). The problem of on-street parking in Nigeria is that most roads in Nigerian cities are narrow thereby causing traffic congestion. This is due to the inadequate off-street parking facilities along transportation routes coupled with poor traffic management (Olorunfemi, 2013).

On-street parking refers to the parking space made available along the curb of a street or road that are designed to accommodate vehicles. If a city provides on-street parking, especially in commercial areas, it makes conscious choices to provide better access to adjacent land use at the expense of more efficiently moving traffic (Olorunfemi, 2013). Richard and David (2007) opine that on-street parking affects the traffic movement in three ways; it reduces the street's capacity, it reduces safety on the road and increases service conflict.

On-street parking is an important factor in promoting business in cities, especially within central business districts. On-street parking provides easy access to businesses located on city streets and occupies less land space than off-street parking. On street parking is an efficient means for allowing multiple users to use the same space at different times to reach multiple destinations. On-street parking creates a barrier between moving traffic and individuals walking on the sidewalks, providing a measure of safety and reducing the level of perceived noise for pedestrians (Edwards 2002).

Despite the importance, on-street parking also has its downside. The same barrier between moving traffic individuals on the sidewalks can create a visual obstruction for pedestrians to cross intersections and vehicles moving along the street, thus increasing accidents. On-street parking also competes with other uses of roadways, including additional lanes for traffic flow, bike lanes, and wider sidewalks. Also, as drivers search for open spaces, congestion on roadways is increased. Lastly, on-street, like all forms of parking, attracts vehicles which increase traffic.

Parking is essential to ensure people have access to goods and services, which they need. It plays a significant role in city's economy. Parking becomes a necessity when one recognizes the fact that urban centers are characterized by interrelated and complex land use activities which require well-planned and efficient performance of the transportation system. Buses, trucks, and cars move goods and passengers in and out of cities on a daily basis. The way cities are organized constitutes a potential for increasing demand for motor-based travel (Akinpelu and Asiyanbola, 2012).

One major objective of transportation planning is to ease the movement of passengers and goods on urban roads. However, in many towns and cities all over the world, there is an undesirable degree of traffic congestion on urban roads. The provision of new roads is often expensive and most municipal government usually considers the option of widening existing roads which involves the destruction of houses and properties in the area. But the widening of roads and destruction of buildings are not necessarily the solution needed in controlling traffic congestion on our roads (Akinpelu and Asiyanbola, 2012).

Unlike other urban problems, the crisis in urban transportation rapidly manifests itself in congestion, delay, crash, parking difficulties and environmental pollution. Ayeni (1983) described these as the most pressing and most visible urban problem of Nigeria cities. Oduola (1981) explained that most urban congestion problems are caused by the less than the optimal manner in which the roads are used. Roadside and on-street parking, roads side trading and total disregard of traffic regulation by road users are a significant human contribution to the traffic problem.

According to Simmon (1996) in the developing countries, parking is a complex and long-term problem which cannot be totally eradicated but managed. Buses and trucks have to load and unload passengers and goods. They all need space to park and this poses a problem if

required spaces are not available. From the above, it is seen that the usage of a vehicle has a direct linkage with parking. This is because after the vehicle is driven to a destination, its usefulness greatly diminishes if there is difficulty in parking. To be effective, therefore, transportation system must include adequate parking facilities in all places that attract vehicle traffic. The research on the impact of on-street parking on traffic shows that on-street parking has socio-economic and environmental benefits as well as challenges, but these are yet to be worked on in Kpakungu. The aim of the study is to analyse the impact of on-street parking on traffic in Kpakungu, Minna; the objectives that would be carried out for the success of this project are to:

- i. Examine the various land uses along the major road corridor (minna-bida apian);
- ii. Assess the various parking facilities and determine the status of the parking facilities;
- iii. Investigate the condition of the parking facilities;
- iv. Evaluate the prevalence of on-street parking; and;
- v. Interrogate the causes of on-street parking;

Study Area

This study is restricted to Kpakungu neighborhood in Minna, Niger state. The research is based on the disturbing effect of on-street parking on traffic and other land use in Kpakungu. The scopes of this research are to identify the causes of on-street parking, identify the contribution of on-street parking to traffic congestion. It also entails examining the extent on-street parking has affected traffic flow in Kpakungu. The findings of the research bring ideas of necessary recommendations needed to battle the problems then the conclusion of the research. The study area will be Kpakungu Minna Niger state which covers an area approximately 114 hectares and is located on latitude $9^{\circ} 35'55.00''N$ and longitude $6^{\circ} 32' 00.00''E$ with a population of 28,924. Kpakungu is one of the wards in Minna with the following ethnic groups: Nupe, Gwari, Yoruba, Igbo, Hausa, and Edo. Kpakungu is dominated mostly by the Nupe and Gwari people who engage themselves mostly with agricultural activities. Kpakungu which is one of the oldest wards in Minna has increased with a growing number of people embarking on the neighborhood.

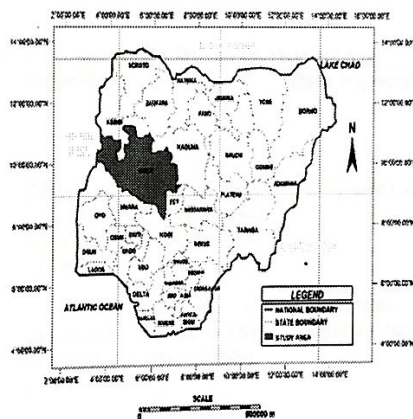


Figure 1: Niger state in the National Context
Source: Ministry of Lands Niger State (2017)

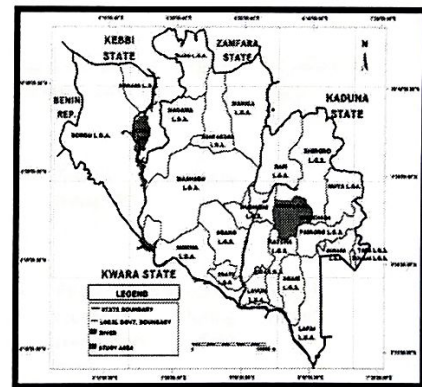


Figure 2: Administrative Delineation of Niger State
Source: Ministry of Lands Niger state (2017)

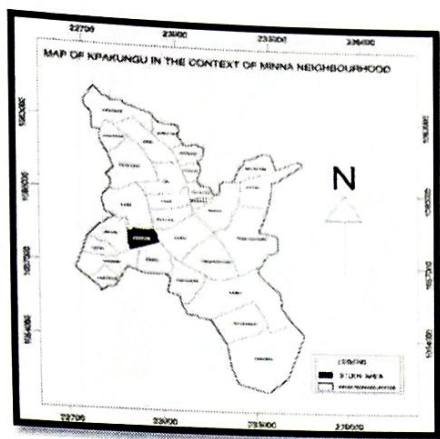


Figure 3: Minna Neighbourhoods showing Kpakungu

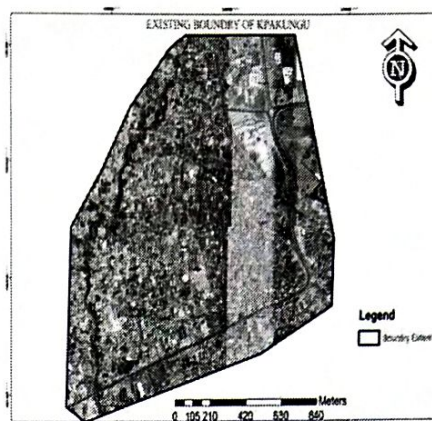


Figure 4: Boundary of Kpakungu

RESEARCH METHOD

Survey research was carried out to ensure the appropriate result for the analysis of the impact of on-street parking in Kpakungu. The research involves cross-sectional research. Distribution of questionnaire to different households to obtain adequate data to quantify the impact of on-street parking on traffic in Kpakungu. The questionnaire aimed towards answering traffic and on-street parking related questions. The questionnaire gives the provision of on the spot data collection. It also involves using physical observation and oral interviews to acquire data. Parking survey would be carried out over a period of one week. The continuous inspection of the cars parked along Kpakungu and also the time interval. It will provide information for the peak periods in which the cars are parked and also information for when on-street parking is at the minimum.

Random sampling will be adopted for this research. In order to achieve the objectives of the research, Table 1 shows the objectives of the research, data required for each objective, the instruments and methods of collection as well as the method of data analysis. The empirical research will provide for the researcher the opportunity to assess the impact of on-street parking on traffic in Kpakungu.

Table 1: Summary of the Research Methodology

S/N	Objectives	Data required	Instrument and method of data collection	Method of data analysis
1	Examine the various land uses along the major road corridor (Minna-Bida Apian)	Secondary data	• Spatial mapping using GPS	Map
2	assess the various parking facilities and determine the condition of the parking facilities	Primary data Secondary data	• Physical observation recorded during researchers field work • Questionnaire administration	Table Graph
3	evaluate the prevalence of on-street parking	Primary data Secondary data	Parking survey census will be conducted during selected period	Table Graph
4	interrogate the causes of on-street parking.	Primary data	• Questionnaire administration	Table Graph

Source: Author's research work (2017)

RESULTS AND DISCUSSION

Mapping of the land use along the major road corridor

This research is based on Kpakungu road corridor along Minna-Bida road which is characterized by the problem of on-street parking leading to traffic congestion. The land use along the road corridor is mainly commercial which is represented in figure 4.1.

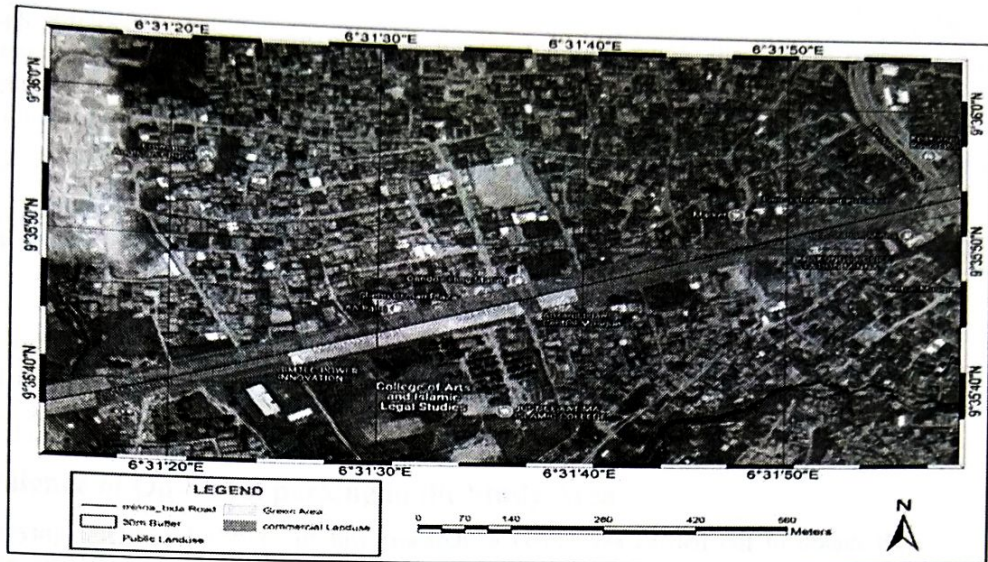


Figure 5: showing the google earth image of the existing land use of the study area
Source: Author's work

Assessment of the parking facilities and their condition

Among the objectives of this research is the assessment of the parking facilities and the conditions of the parking facilities. In the course of the research, it was noticed that parking facilities are provided for the business owners but a provision was not made for the customers in some business areas. A survey was carried out to show the business areas with parking facilities provided for the business owners and customers and also areas with parking facilities provided for only the business owners. Figure 4.2 shows the percentage of businesses with parking provided for the customers and the business areas without the provision of parking facilities.

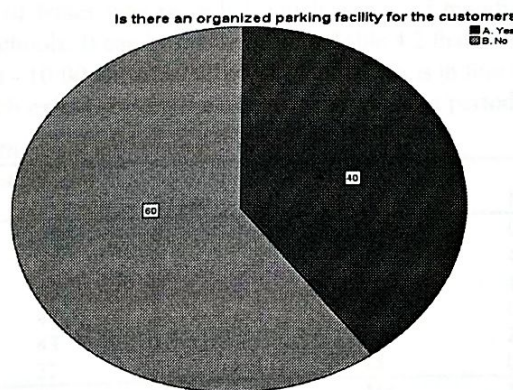


Figure 6: The percentage of business with parking facilities for the customers
Source: Field Survey, 2017

40% of the business in the area is provided with parking facilities for the customers while 60% of the business does not have provision for the customers. It was understood that some business areas were provided with parking spaces but the spaces are now rented out to small retail business which now forced customers to park on the street. Upon further research, it was understood that these retail business owners were approved by the government. So the government is the contributing factor for the condition of the parking facility been abused. In those areas with retail business in front of the already established business areas, business owners are also forced to park their cars on the street. Different commercial transport agencies in the area were also analyzed and also their parking condition. The condition of the car park of the commercial transport workers within Minna i.e. the Niger State Urban Transport Workers (NURTW) is not suitable. There are no available car parks for these commercial transport users and they are forced to park in front of business areas and also get their customers parked on the street. A survey was carried out to know the condition of the facilities of the car parks provided for the road transport workers. Figure 6 shows the condition of the facilities provided for the car parks.

Though different facilities were provided for the transport union, there is no proper maintenance of these facilities. 48% agreed that these facilities are bad and either needs to be replaced or properly maintained. It was understood that there is no proper maintenance team allocated for the facilities this is shown in Table 2.

Table 2: The condition of facilities in the car park

	Frequency	Percent
Very good	8	13.3
Good	1	1.7
Fair	11	18.3
Bad	29	48.3
Very bad	11	18.3
Total	60	100.0

Source: Field Survey, 2017

Prevalence of On-Street parking in the Study Area

In carrying out the objectives of this research, a count was carried out to obtain the prevalence of on-street parking over a selected period of time along the road corridor of the study area. The parking survey was carried out between the hours of 6:00 am to 6:00 pm at intervals of two (2) hours on Monday 24th July 2017 to Saturday 29th July 2017. The result of the volumetric parking survey has been collated accordingly and presented thus:

Volumetric parking survey along Kpakungu road Corridor Minna-Bida Road on Monday

Table 3 reveals that a total number of 1146 vehicles parked on the street of Kpakungu during observed hours of the day. The traffic constitutes of 535 cars, 230 tricycles, 22 buses, 37 trucks, 315 motorcycles and 7 bicycles. This shows that cars are the most frequently used vehicles on the road corridor. Monday recorded a considerable large number of cars which are mainly commercial vehicles; it also recorded a large number of trucks which consisted of petrol tankers, and trailers offloading loads to different commercial business. A considerable number of buses was recorded which was used mainly to pick and convey students of different schools. It can be deduced from Table 4.2 that on-street parking is at its peak between 8:01 am - 10:00 am and 2:01p – 4:00 pm. This is in line with the reality of the two peak periods which exist between the morning and evening periods.

Table 3: Volumetric Traffic count for Monday

Time Period	Types of vehicles						Total
	Cars	Tricycle	Buses	Trucks	Motorcycle	Bicycle	
6am-8am	82	19	2	8	17	0	128
8:01-10pm	82	52	4	6	90	4	238
10:01-12pm	90	42	6	7	50	1	196
12:01-2pm	100	47	2	5	80	0	234
2:01-4pm	98	43	5	7	53	2	208
4:01-6pm	83	27	3	4	25	0	142
Total	535	230	22	37	315	7	1146

Source: Field Survey, 2017

Volumetric parking survey along Kpakungu road Corridor Minna-Bida Road on Tuesday

Table 4 shows the volumetric count for Tuesday, which differs slightly with that of Monday. It reveals a total number of 1067 transport vessels were counted during the observed hours of the day. The traffic constitutes 466 cars, 236 tricycles, 50 buses, 61 trucks, 251 motorcycles and 3 bicycles. Motorcycles recorded the second highest number that parked on the street. Tuesday also recorded the peak periods between 8:01 am – 10:00 am and also 2:01 – 4:00 pm.

Table 4 Volumetric Parking Survey for Tuesday

Time period	Types of vehicles						Total
	cars	Tricycle	Buses	Trucks	Motorcycle	Bicycle	
6am-8am	62	21	8	17	25	0	133
8:01-10pm	105	37	9	9	40	1	201
10:01-12pm	66	36	7	10	40	2	161
12:01-2pm	87	42	7	11	51	0	198
2:01-4pm	89	62	12	9	58	0	230
4:01-6pm	57	38	7	5	37	0	144

Total	466	236	50	61	251	3	1067
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Source: Field Survey, 2017

Volumetric parking survey along Kpakungu road Corridor Minna-Bida Road on Wednesday

Table 5 differs greatly with the previous days due to it being the middle of the week. A total number of 870 vehicles parked on the street of Kpakungu during observed hours of the day. The traffic constitutes of 458 cars, 140 tricycles, 42 buses, 64 trucks, 165 motorcycles and 1 bicycle. Bicycles recorded the least which reveals that most commuters don't use bicycles. It can be deduced from Table 4.4 that on-street parking is at its peak between 8:01 am - 10:00 am and 2:01p - 4:00 pm. While the off-peak periods were between 6:00 am - 8:00 am and 4:01pm-6: 00 pm with a total number of 124 transport vessels and 82 transport vessels respectively.

Table 5: Volumetric Parking Survey for Wednesday

Time period	Types of vehicles						Total
	Cars	Tricycle	Buses	Trucks	Motorcycle	Bicycle	
6am-8am	65	14	9	21	15	0	124
8:01-10pm	117	30	3	13	38	0	201
10:01-12pm	76	22	4	11	18	1	132
12:01-2pm	68	22	7	5	24	0	126
2:01-4pm	86	37	15	10	57	0	205
4:01-6pm	46	15	4	4	13	0	82
Total	458	140	42	64	165	1	870

Source: Field Survey, 2017

Volumetric parking survey along Kpakungu road Corridor Minna-Bida Road on Thursday

A significant increase in traffic was noticed on Thursday along the same road corridor. Table 6 reveals that 1286 transport vessels parked on the street of the study area. The survey constitutes of 387 cars, 376 tricycles, 36 buses, 29 trucks, 453 motorcycles and 5 bicycles. Cars, motorcycles, and tricycles are the most frequently used transport vessels along the corridor. The morning peak period was between 8:01 am -10:00 am with 233 transport vessels while the evening peak period was between 4:01 pm - 6:00 pm with 281 transport vessels. The traffic was least between the hours of 6:01 - 8:00 am with a total of 82 transport vessels.

Table 6: Volumetric Parking Survey for Thursday

Time period	Types of vehicles						Total
	cars	Tricycle	Buses	Trucks	Motorcycle	Bicycle	
6am-8am	48	16	1	5	12	0	82
8:01-10pm	58	68	12	7	87	1	233
10:01-12pm	51	67	3	4	90	0	215
12:01-2pm	83	74	3	5	69	2	236
2:01-4pm	62	68	10	3	95	1	239
4:01-6pm	85	83	7	5	100	1	281
Total	387	376	36	29	453	5	1286

Source: Field Survey, 2017

Volumetric parking survey along Kpakungu road Corridor Minna-Bida Road on Friday

Friday the end of the working days has a volumetric count that differs with the other days of the week observed. Table7 reveals that 1422 transport vessels were counted during the observed hours of the day. The peak and off-peak periods were also observed. The table revealed that on-street parking was at its peak between 10:01 am - 12:00 noon and 12:01-2:00 pm. The evening peak was noticed to have a significant increase in on-street parking due to the Muslims gathering to observe their Friday Jummat prayer. It was also noticed that the period of 4:01 - 6:00 pm had a considerable number of on-street due to the fact that most dwellers were traveling for the weekend.

Table 7: Volumetric Parking Survey for Friday

Time period	Types of vehicles						Total
	cars	Tricycle	Buses	Trucks	Motorcycle	Bicycle	
6am-8am	54	10	0	13	12	1	90
8:01-10pm	57	46	12	13	84	0	212
10:01-12pm	100	104	9	10	100	2	325
12:01-2pm	89	91	7	37	111	0	335

2:01-4pm	69	40	15	10	68	5	207
4:01-6pm	86	98	4	13	52	0	253
Total	455	389	47	96	427	8	1422

Source: Field Survey, 2017

Volumetric parking survey along Kpakungu road Corridor Minna-Bida Road on Saturday

The weekend traffic was also observed for the road corridor of the study area. Table 8 revealed that the weekend traffic had a considerable number of vehicles parked on the street. 1178 transport vehicles were counted during the observed hours of the day. It was noticed that the reason for the traffic was due to the fact that Saturday is the market day in the town. Locals coming from different location to the market to sell their goods increased the traffic. Also, a considerable number of trucks were counted, different trailers bring goods of various kinds to the market were counted. The traffic was at its peak during the hours of 8:01 am – 10:00 am and also at 4:01 pm – 6:00 am. It is said noticed the reason for the weekend traffic was due to commercial interest of the people.

Table 8 Volumetric Parking Survey for Saturday

Time period	Types of vehicles						Total
	cars	Tricycle	Buses	Trucks	Motorcycle	Bicycle	
6am-8am	78	16	3	19	11	0	127
8:01-10pm	79	38	7	4	70	0	198
10:01-12pm	113	83	16	9	95	0	316
12:01-2pm	75	50	0	4	55	0	184
2:01-4pm	87	27	3	7	45	0	169
4:01-6pm	93	28	0	10	53	0	184
Total	525	242	29	53	329	0	1178

Source: Field Survey, 2017

Summary of Traffic Distribution for the observed days of the week along corridor

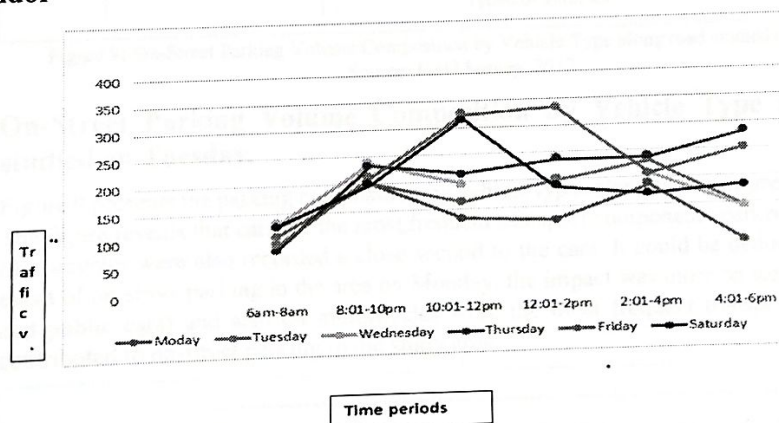


Figure 6: -Traffic distribution for the observed days of the week along corridor A. Source: - Field Survey, 2017.

Figure 6 summarizes the traffic distribution for the observed days of the week along the corridor of the study area. The most noticeable period of on-street parking along the study area was during the peak hour between 8:01 am – 10:00 am. This is because of individual workers, staff, and students of Technology, Minna who have activities to engage in at Gidan Kwano campus.

It could be deduced from Figure 7 that the two (2) peak periods were constant for most days of the week observed. The hours of the day associated with the peak periods are from 8:01 am – 10:00 am for the morning peak and 2:01pm-4: 00 pm for the evening peak. Figure 8 reveals that the on-street parking is at its highest on Friday. This is due to the increase in on-street parking from the traffic that came to observe their Jummat prayer in the central mosque of the study area.

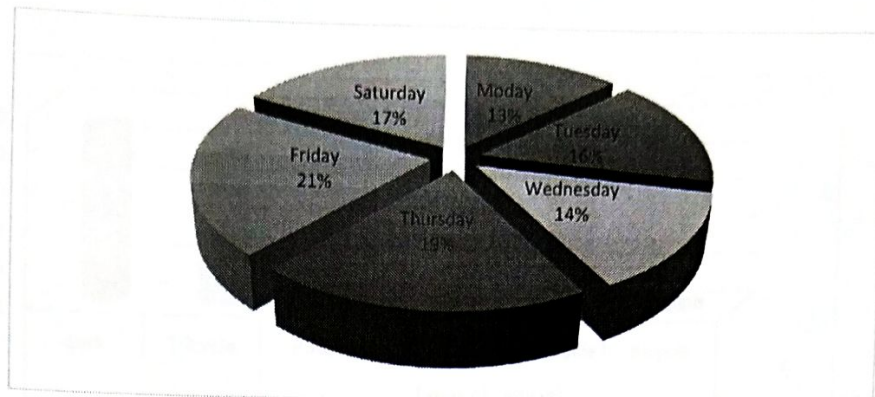


Figure 7: Percentage Composition of Traffic for the days of the week selected.
Source: Field Survey, 2017.

On-Street Parking Volume Composition by Vehicle Type along road studied on Monday.

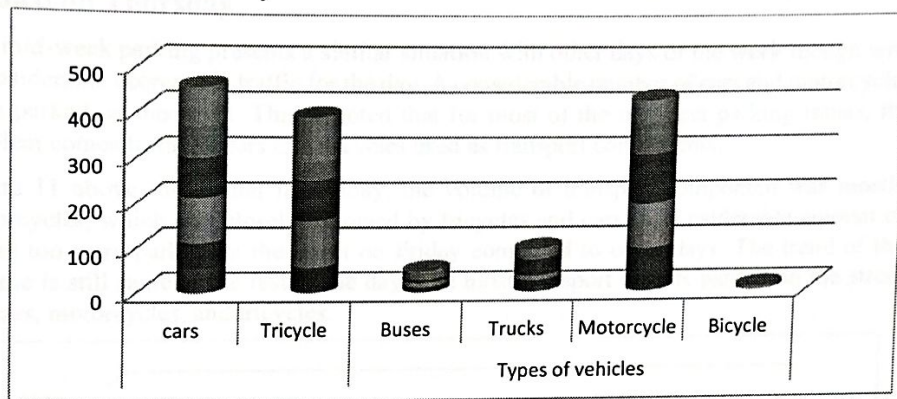


Figure 8: On-Street Parking Volume Composition by Vehicle Type along road studied on Monday
Source: Field Survey, 2017

On-Street Parking Volume Composition by Vehicle Type along road studied on Tuesday.

Figure 9 presents the parking composition by vehicle types along the study area for Monday. The figure reveals that cars are the most frequent transport components parked on the street. Motorcycles were also recorded a close second to the cars. It could be deduced that in the event of on-street parking in the area on Monday, the impact was more on cars (private cars and public cars) and also on motorcycles were the most frequent transport vessels that contributed to on-street parking in the study area.

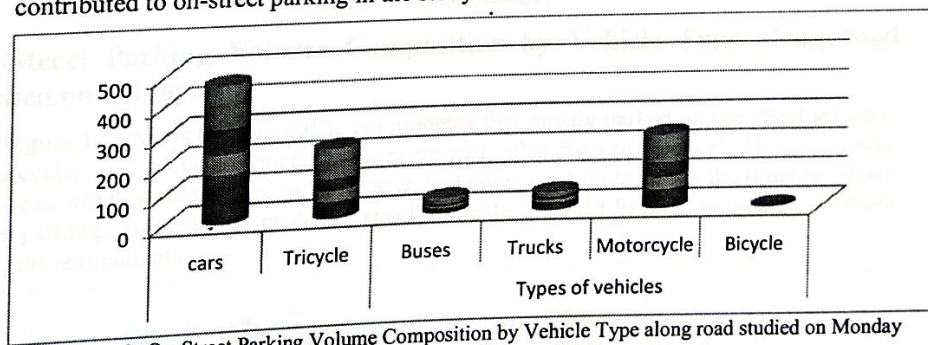


Figure 9: On-Street Parking Volume Composition by Vehicle Type along road studied on Monday
Source: Field Survey, 2017

On-Street Parking Volume Composition by Vehicle Type along road studied on Wednesday

Figure 10 shows that the most transport component that was parked mostly were cars, tricycles, and motorcycles. Cars recorded the most frequently parked transport vessels, followed by tricycles and then motorcycles. It could be deduced that the transport vessels that constitute the problem of on-street parking are cars, motorcycles, and tricycles. The problem of on-street parking stems from these transport vessels.

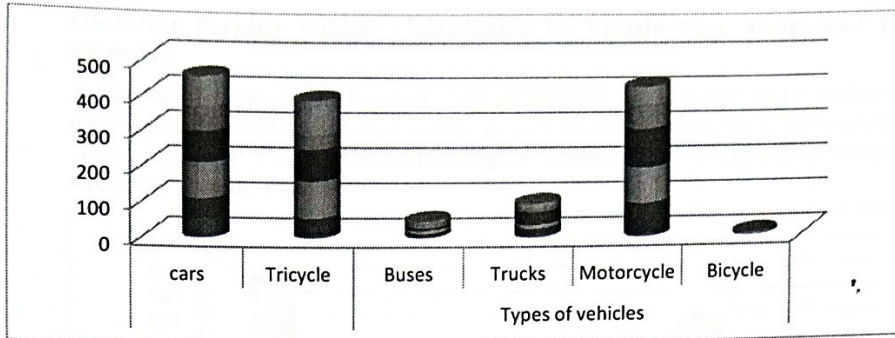


Figure 10: On-Street Parking Volume Composition by Vehicle Type along road studied on Wednesday
Source: Field Survey, 2017

On-Street Parking Volume Composition by Vehicle Type along road studied on Thursday

The mid-week parking presents a similar situation with other days of the week though with a considerable decrease in traffic for the day. A considerable number of cars and motorcycles were parked on the street. This is noted that for most of the on-street parking issues, the problem comes from the cars and tricycles used as transport components.

Figure 11 above shows that for Friday, the volume of transport component was mostly motorcycles, which was closely followed by tricycles and cars. A considerable amount of trucks too were parked on the street on Friday compared to other days. The trend of the volume is still same as the rest of the day. The most transport vessels parked on the street are cars, motorcycles, and tricycles.

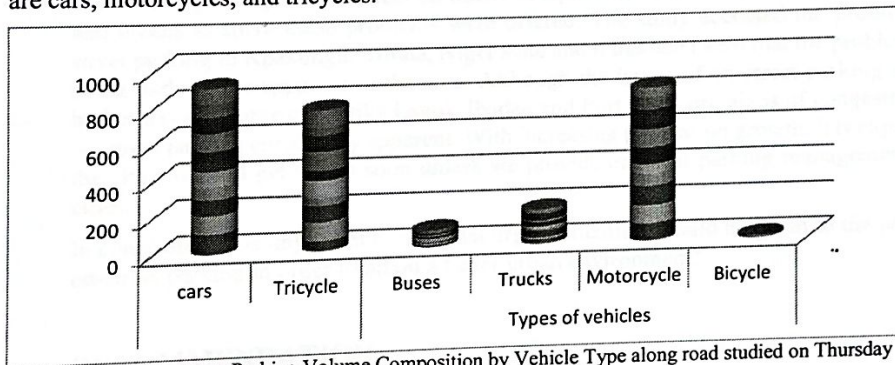


Figure 11: On-Street Parking Volume Composition by Vehicle Type along road studied on Thursday
Source: Field Survey, 2017

On-Street Parking Volume Composition by Vehicle Type along road studied on Friday.

The Figure 12 reveals that the traffic components that mostly parked on the street are cars, motorcycles, and tricycles which are the same with other days of the week. Here, a pattern is noticed which shows that bicycles, trucks, and buses contribute less to the problem of on-street parking. To curb this problem, special attention would have to be placed on these transport components.

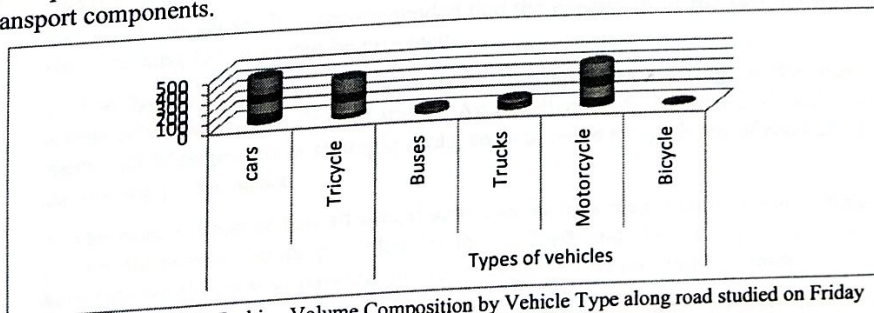


Figure 12: On-Street Parking Volume Composition by Vehicle Type along road studied on Friday
Source: Field Survey, 2017

On-Street Parking Volume Composition by Vehicle Type along road studied on Saturday

At the end of the week, the Figure 13 reveals that cars, motorcycles, and tricycles still remain the frequently used traffic component as they record the highest volume all through the corridors studied. Cars maintained the highest volume of transport component parked on the street of the study area.

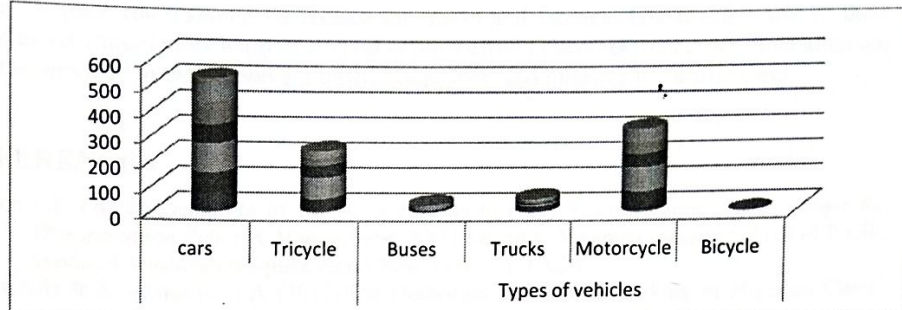


Figure 13: On-Street Parking Volume Composition by Vehicle Type along road studied on Saturday
Source: Field Survey, 2017

CONCLUSION

The conclusion of this research work is based on the research findings. An integral part of the transport system which plays a crucial role in the management of traffic and congestion is parking (Allison, 2002). This study has been able to identify the nature, impact, and extent of on-street parking and its effect on traffic in Kpakungu. Some useful suggestions on ways and means to solve these problems were offered. The study accessed the problem of on-street parking in Kpakungu, Minna, Niger state and it has been seen that the problems of on-street parking are apparent in the area. Although the issues of on-street parking are not as bad of those of large cities like Lagos, Ibadan and Port Harcourt, signs of congestion due to on-street parking are already apparent. With increasing population growth, it is expected that the situation will get worse soon unless we provide efficient parking management for our cities.

In conclusion, it is important to note that urgent attention should be given to the problem of on-street parking in order to attain a better urban environment:

RECOMMENDATION

The prevalence of on-street parking is a huge hindrance to the flow of traffic. On-street parking forms one major problem that makes traffic conditions chaotic in Nigerian cities (Asiyanbola and Akinpelu 2012). In the course of the research findings detailed in the previous chapter, the following recommendations have been proposed in order to efficiently and effectively deal with the problems of on-street parking in the study area.

1. The narrowness of the carriageway do not give enough space for on-street parking (side kerb parking) and due to the absence of the provision of on-street parking on the street parking, road users resort to parking on the street. This leads to constricting the already narrow carriageway. It is recommended that the expansion of the carriageway so that on-street parking facilities can be provided.
2. The lack of policies guiding or restricting on-street parking in the study area has immensely affected the flow of traffic. An installation of "No Parking" and "No Waiting" signs should be placed in strategic spots, so as to solve the problem of road users that insist on parking on the street.
3. The need to stop or ban all illegal activities such as illegal commercial activities carried out on the parking space provided for the land use and also on the street. Banning these activities would prevent parking on the street thereby improving the traffic flow.
4. Tax should be allocated or fines should be issued to on-street parking for the duration of the time a road user would park on the street. If this is clearly followed, it would prevent the problem of on-street parking, thereby improving traffic flow.

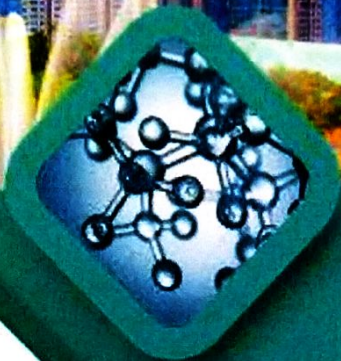
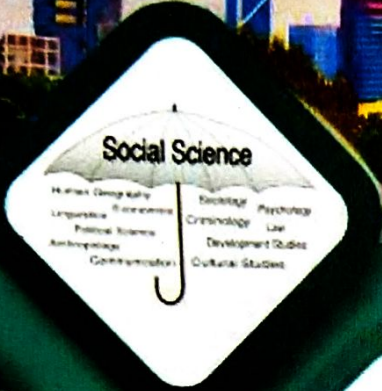
5. The commercial road users should be given a suitable space off-street, also a sign should be issued to the passengers indicating that they should go into the allocated car parks to use the transport service. This medium would prevent passengers from standing on the roadside waiting for the commercial cars. This would prevent traffic congestion.
6. The use of mass transit is advantageous in moving more people and reduces the transport vessels ploughing the road. Also, the space occupied by smaller vehicles would be greatly reduced. Mass transit lanes should be incorporated in order to reduce traffic congestion
7. An alternate route should be created for trucks and Lorries. The constant use of their vehicles has caused more harm than good to the road and the other road users. If an alternate route is provided, it would prevent traffic congestion and improve the traffic flow.

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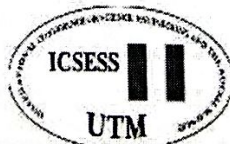
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Analysis of Residents' Satisfaction in Abuja Residential Police Barracks, Nigeria

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ABSTRACT

Housing ranks only after food in the order of man's needs, it transcends just the supply of houses, but also the provision and access to supporting community facilities. The aim of this research is to examine residents' perception of satisfaction with regards to Police Barracks' Housing Condition in Abuja, with the following objectives, to: assess the Condition of Housing in the selected Police Barracks; and examine the residents' satisfaction with dwelling components of the Police Barracks. Stratified random sampling method was employed to determine the particular police barracks for sampling while, simple random sampling was employed to determine the households for sampling. Respondents' satisfaction levels show that in Garki Barracks 52.4% were dissatisfied, 27% were just satisfied, 19% indicated satisfaction for the electrical component of their dwelling; In Nyanya Barracks, 10.2% were very dissatisfied 42.4% were dissatisfied, 42.4% were just satisfied while 3.4% were satisfied while in MD Abubakar Barracks, 3.2% were very dissatisfied 46.5% were dissatisfied, 8% were just satisfied and 76.2% of the respondents were satisfied while 7% were very satisfied. The research established through empirical study that Resident Police Officers are generally dissatisfied with the Housing in Barracks in Abuja, also by comparative analysis satisfaction levels of building, neighbourhood and management components of the three barracks it established a significant relationship between the satisfactions levels of these components across the three barracks studied. This study analysed Residents' Satisfaction of Residential Buildings in Police Barracks in Abuja, Nigeria by employing variables of building, neighbourhood and management components which determine Resident Satisfaction in Police Barracks. The findings of this research show that these variables affect residents' satisfaction therefore establishing previous studies in Housing Satisfaction in Nigeria.

Key words: Housing, Housing Satisfaction, Residents

INTRODUCTION

Housing ranks only after food in the order of man's needs, it transcends just the supply of houses, but also the provision and access to supporting community facilities and services, safety and security, privacy, neighbourhood and communal association, work and recreational activities, and security of tenure that make for healthy living (Sulyman, 2015; Olotuah, 2006). The ultimate goal of every housing scheme is to further improve housing adequacy so as to meet the needs of the residents, this is because housing is not just a vital national investment but also the right of every individual. Nigeria's housing challenges are both qualitative and quantitative (Federal Republic of Nigeria, 1991), studies show that while quantitative challenges can be surmounted by improving on housing supply, qualitative challenges have for the most part been as a consequence of the failure of housing providers to consider processes and determinants of residents' satisfaction (Ukoha and Beamish, 1997; Ilesanmi, 2010). Oladapo (2006) considered that qualitative problems were the major limitations of urban housing in Nigeria.

Police barracks in Nigeria have been described as notorious for their filthy condition and poor maintenance (Civil Society Panel on Police Reform in Nigeria, 2012), with most of the officers unhappy with their living conditions which some of them say can be compared to abodes for pigs and other animals (Dachen, 2015). The aim of this research is to examine residents' perception of satisfaction with regards to Police Barracks' Housing Condition in Abuja, with the view to

proffering solutions and sustainable strategies that will ensure improvements in practice to enhance better service delivery consequently enhancing better quality of life for officers of the Nigeria Police Force with the following objectives, to: assess the Condition of Housing in the selected Police Barracks; examine the residents' satisfaction with dwelling components of the Police Barracks; and evaluate the level of residents' satisfaction with the neighbourhood components of the Police Barracks in Abuja.

MAIN RESULTS

Respondents' satisfaction levels show that in Garki Barracks 52.4% were dissatisfied, 27% were just satisfied, 19% indicated satisfaction for the electrical component of their dwelling; In Nyanya Barracks, 10.2% were very dissatisfied 42.4% were dissatisfied, 42.4% were just satisfied while 3.4% were satisfied. And in MD Abubakar Barracks, 3.2% were very dissatisfied 46.5% were dissatisfied, 8% were just satisfied and 76.2% of the respondents were satisfied while 7% were very satisfied.

Table 1: Residents Satisfaction with Electrical Component

Electrical Component	Nyanya	Garki	MD Abubakar
Very Dissatisfied	6 (10.3)	1 (1.6)	12 (3.2)
Dissatisfied	25 (43.1)	33 (52.4)	30 (8.0)
Neutral	25 (43.1)	17 (27.0)	21 (5.6)
Satisfied	2 (3.4)	12 (19.0)	285 (76.2)
Very Satisfied	-	-	26 (7.0)
Total	58 (100)	63 (100.0)	374 (100.0)

Source: Fieldwork, 2016

Respondents across the three barracks expressed high levels of dissatisfaction with the Roof Condition of their dwelling in Garki, 28.6% were very dissatisfied, 46% were dissatisfied, 11.1% were neutral, and 14.3% were however satisfied. In Nyanya, 35.6% were very dissatisfied, 44.1% expressed dissatisfaction, 11.9% were indifferent; and 8.5% of the respondents was satisfied. In MD Abubakar Barracks, 58.8% of the respondents were dissatisfied, 8.3% were indifferent, 32.1% were satisfied, while 0.8% was very satisfied.

Table 2: Residents' Satisfaction with Roof Condition

Roof Condition	Nyanya	Garki	MD Abubakar
Very Dissatisfied	21 (35.6)	18 (28.6)	-
Dissatisfied	26 (44.1)	29 (46.0)	220 (58.8)
Neutral	7 (11.9)	7 (11.1)	31 (8.3)
Satisfied	5 (8.5)	9 (14.3)	120 (32.1)
Very Satisfied	-	-	3 (0.8)
Total	59 (100)	63 (100.0)	374 (100.0)

Source: Fieldwork, 2016

Relationship between the levels of satisfaction of residents with the housing in the three selected police barracks in Abuja. The research established through empirical study that Resident Police Officers are generally dissatisfied with the Housing in Barracks in Abuja, also by comparative analysis satisfaction levels of building, neighbourhood and management components of the three barracks it established a significant relationship between the satisfactions levels of these components across the three barracks studied. The study established assertions by Onibokun (1973) Oladapo (2006) and Jiboye (2010) that housing satisfaction transcends just the provision of just the dwelling components but include the neighbourhood and management components among other factors that influence satisfaction.

CONCLUSION

This study analysed Residents' Satisfaction of Residential Buildings in Police Barracks in Abuja, Nigeria by employing variables of building, neighbourhood and management components which determine Resident Satisfaction in Police Barracks. The findings of this research show that these variables affect residents' satisfaction therefore establishing previous studies in Housing

Satisfaction in Nigeria. The findings showed that the respondents were generally dissatisfied with their housing environment irrespective of their location but were especially dissatisfied with the management component.

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