Civil and Environmental Research
ISSN 2224-5790 (Paper) ISSN 2225-0514 (Online)
Vol.6, No.4, 2014
www.iiste.org

Examination of On-Street Parking and Traffic Congestion Problems in Lokoja

Olorunfemi Samuel Oluwaseyi[1*], Olowosegun Adebola[1], Koffi Ayadu Edwin[2], [4]Okoko Eno .E[1]and Mobolaji Stephen[1]

1. Department of Transport Management Technology Federal University Akure Nigeria
2. Akwa-Ibom State Polytechnic, Ikot Osuru, Ikot Ekpene, Nigeria

*E-mail of the corresponding author:lovesamo001@gmail.com

Abstract

Parking and traffic congestion is synonymous to each other because failure to meet parking demand of people in a city lead to on-street parking that results to traffic congestion. Traffic congestion is a condition on road networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queuing. The availability of less space in urban areas has increased demand for parking space especially in central business area. Inadequate off-street parking in most of our urban centres has metamorphosed to the problem of on-street parking coupled with inadequate traffic management commonly experienced today in most Nigerian cities. In view of the above, this research work examined the menace of on-street parking and traffic congestion problems in Lokoja, Nigeria. The study was conducted using questionnaires and field observation to collect the required data at the locations/corridors in the city where on-street parking and traffic congestion were prominent and also, adequate survey of the traffic devices in the locations of study was also conducted to determine it functionality. Four hundred and fifty one (451) questionnaires were administered to the shop-owners, one hundred and seventy four (174) to the parked vehicle-owners and one hundred and two (102) to the commuters, to make a total of seven hundred and twenty seven (727) research samples. Finding revealed that inadequate parking, infectiveness of traffic devices, absences of loading and offloading bays etc have caused on-street parking and traffic congestion in Lokoja. To reduce the menace, policy measures are recommended among which are; institution of enforcement of traffic rules and regulations by disciplined law enforcement agents, relocation of certain activities that caused on-street parking and introduction of intelligent transport system which make use of sustainable devices such as Bluetooth and other communication/mobile devices, traffic management improvement and provision of off-street parking facilities in the city plan.
Key word: Transportation, on-street parking, traffic management, urban center, traffic congestion, Lokoja

1.0 Introduction

Parking is an integral component of the transport system. It plays a crucial role in the management of traffic and congestion (Allison, 2002). On-street parking constitutes one major problem that makes traffic situation chaotic in Nigerian cities. Most roads in Nigerian cities are narrow and lack pedestrian lanes. There are cases of double parking along these narrow roads thereby causing traffic congestion. This is due to the non-availability of off-street parking facilities along the transportation routes coupled with inadequate traffic management (Asiyanbola and Akinpelu 2012; Olorunfemi, 2013). The urban growth in terms of population increase and the spatial expansion of the urban centers which come along with both increasing car ownership and demand for movement for employment purpose, leisure, education and other urban activities (Osoba, 2012). Subsequently, some cities cannot cope with the explosive growth in the number of people due to urban activities especially at the urban centers. The situation is getting worse with the growing number of visitors and patrons due to urban revitalization, suburban development, and the increasing trend of mobility which make parking situation more challenging. Therefore, Parking is increasingly giving attention as an important aspect of transportation planning (Jeffrey, 2007).

Cities and traffic have developed hand-in-hand since the earliest large human settlements and the commercial areas remain the high traffic generating land use type (Osoba, 2012; Olorunfemi, 2013). The traffic incidence on the urban streets as a result of agglomeration of urban activities causes traffic congestion and thoroughfares (ECMT, 2007). This causes the journey time to be longer and socio-economic life of the residents are being affected with the associated high cost of fuel consumption and the environment issues such as pollution (Fadairo, 2013).

The road transport operation is a circulatory system that must be a continuous process and any infringement at any point along the line will definitely affect the whole system and hinder its effectiveness (Osoba, 2013). Therefore, parking facilities are essential in order to allowed flow of traffic. Since, parking challenges are no longer confined to the city centres, the challenges now extend throughout the urban region.

Parking contributes to the appearance of city and suburbs; affects traffic congestion and traffic operations; and equally influences the choice of mode and route of travel which also affects the viability and competitive posture of commercial areas (Weant and Levinson, 1990). Since, city is characterized by different various land use activities and patterns of circulation is partly a function of the land use activities and their spatial distribution. Therefore, efficiency of this circulation depends upon existing transportation system which parking facilities are major component. In situation of lack of provision and poor planning in respect to other urban land use activities the economic activities of the city may be affected (Obot et al, 2009).

Various approaches have been taken to combat the problem of street parking and traffic congestion in Nigeria and beyond. In order to solve the problems of street parking and associated traffic congestion, some measures have been adopted many countries. In ancient Rome, Julius Caesar once prohibited the movement of cars during day light to relieve traffic congestion on roads (Bruton, 1975), while, in the United States, in 1973, cautions were given by the Organization for Economic Cooperation and Development Report on the extensive use of Restraint of Road traffic techniques in the developed countries as a means of reducing heavy urban traffic problems (OECD, 1973, Aderamo, 2012). Furthermore, different studies of congestion and its causes in the context of Nigerian Towns and Cities have been carried out. Ogunbodede (2003) studied traffic congestion in Akure Nigeria using GIS approach. It was argued that traffic congestion is as a result of the increasing growth in motor vehicles without a consistent improvement in transport facilities such as road network, traffic management techniques and parking spaces. The study also highlighted illegal roadside parking and lack of geospatial information necessary to tackle the spatial problem as other causes of traffic congestion. The study further suggested the use of a dynamic Traffic Information System (TIS) structure to monitor congestions in Akure city. Bashiru and Waziri (2008), study the problems of intra-urban traffic in Lagos Nigeria and he found that 57% of commuters and motorists spend between 30 to 60 minutes on the road due to traffic congestion, with the worst high traffic incidence occurring on Mondays. The factors that caused traffic congestion in Lagos from the study include on-street parking, trading activities, pot holes/bad road, loading and discharging of passengers on the roadsides, illegal bus stops, flooding/poor drainage, vehicle breakdown, narrow road sections, religious activities, lack of parking space and poor traffic management at the road intersections such as lack of traffic signals. Aderamo and Atomode (2011) also examined the problem of traffic congestion at road intersections in Ilorin. The study found that traffic wardens and parking problems are the greatest causes of traffic congestion/delays at road intersections in Ilorin. Most of these studies have identified congestion as the most serious issues confronting urban centers as a result of on-street parking coupled with poor traffic management.

However, organization for Economic Co-operation and Development (OECD) and European Conference of Ministers of Transport (ECMT) (2007), opine that, there is no single, broadly accepted definition of traffic congestion. The principal reason for this lack of consensus is that congestion is both:

- A physical phenomenon relating to the manner in which vehicles impede each other's progression as demand for limited road space approaches full capacity.
- A relative phenomenon relating to user expectations vis-à-vis road system performance.

Traffic congestion in urban areas is often the outcome of successful urban economic development, employment, and housing and cultural, policies that make people want to live and work relatively close to each other and attract firms to benefit from the gains in productivity thus derived.

On- street parking refers to the parking space made available along the curb or shoulder of a street or road that are designed to accommodate vehicle. If a city provides on-street parking, particularly in commercial area, it makes conscious choices to provide better access to adjacent land use at the expense of more efficiently moving traffic (Olorunfemi, 2013). The use of on- street parking affects the traffic movement in three ways; it reduces a street's capacity, it reduces safety, and increases service conflict (Richad and David, 2007). On street parking causes safety and congestion problems by blocking one or two traffic lane, reducing visibility, insecurity and forcing pedestrians to walk in the road if no proper footpaths are provided and it also obstructs access for emergency services thereby resulting into accidents and affecting traffic movement (Rye, 2010). There are two types of on-street parking, official and non-official parking. The official on-street parking includes bank car parks, administrative car parks, office car parks, and recreational car parks and media car park while non-official on-street parking is referred as kerbs as its nearness to destination. These include commercial parks, shopping parks, etc. Motor Park in the past was designed for reason of esteem to promote a company's image and to give the passengers a feeling of well-being and safety.

Parking is one of the experiences that people have when traveling to a destination and it plays a crucial role in managing traffic and congestion as it is generally recognized that town center depends on a rapid turn-over of parking to meet the demand for short-stay visit (Asiyanbola and Akinpelu, 2012). Convenient and affordable parking is considered as good, but reverse is the case in the study area. It is highly dispiriting that parking and inadequate traffic management has become a serious problem that confronted the road users in the study area. Therefore, this study examines the menace of on-street parking and traffic congestion in Lokoja. The

objectives are to assess the existing parking spaces in the city; examine the available traffic devices in the town; identify the causes of traffic congestion in the town and ascertain the mode of transport within the city.

2.0 Literature Search Composition on Traffic Congestion and Parking

One of the main problems of today's road networks is parking. In most of the cities in developing countries the planning of road networks lacks the provision of the entire basic infrastructure to be provided for the safe and orderly movement of the vehicles (Akhuewu, 2010); Olorunfemi, 2013). An ideal road network should have exclusive lanes to segregate fast moving and slow moving vehicles, cycle lanes, exclusive bus bay and service lanes (Sivabramanian and Malarvizhi, 2007). However, increase in numbers of vehicles without adequate infrastructure, has accentuated the problems of traffic congestion, traffic delay, parking problems, accident, and urban land use severance (Raji and Wasiri, 2008). This has led to the encroaching of commercial activities on the footpath and ultimately on the carriageway. However, the carriage way is most often encroached with hawking activities and parking of vehicle (Sivabramanian and Malarvizhi,2007).

Asiyanbola and Akinpelu, (2012), show that one of the major goals of transportation planning is to ease the movement of passengers and goods on urban roads. In many towns and cities all over the world, there is undesirable degree of traffic congestion on urban roads. The provision of new roads is often expensive and most municipal governments usually consider the choice of widening existing roads which involves the demolition of houses and properties. The literature reveals that widening of roads and concomitant destruction of buildings are not necessarily the panacea needed in controlling traffic congestion on our roads.

According to Obot and Umoh,(2007), in Nigeria, like elsewhere, where cars are one of the dominant modes of transportation, urban circulation is one of the most obvious problems and parking seems to be an overlooked element in transportation development. Several studies have shown that improvement in the living standards of people as a result of wage increase contributes almost as much as the growth of cities to contemporary urban traffic condition in Nigeria (Tanimowo and Atolagba, 2006). However, for a city to function as a system, transportation must be efficient and reliable to facilitate, not only intercity movement of people and their activities, but encourage intra-city movements within the city. These movements are from point of origin to the point of destination (Akhuewu, 2010).

Asiyanbola and Akinpelu, (2012), observes categories of space in urban centre include exchange space and movement space which related to motor park, interchange point etc. As city transportation system expands, it takes up more spaces. The construction of new roads, the expansion of the existing roads, the building of parking lot requires the acquisition of part of the exchange space, the more space allocated to transport, the greater the requirement for more traffic space. Automobile therefore has an insatiable appetite for space, it uses space at home, at work, shopping and even when some spaces are empty, and it is tied up or reserved for the automobile. Automobile do not only have exclusive space for moving, they also have a" zone of influence" which expands as the speed and quantity of traffic increases, thus reducing the effectiveness of exchanges space and the level of interaction. Meanwhile, on-street parking in most cases results into chaotic traffic due to parked cars along the road and this has led to large amount of traffic circulating looking for a parking space, thus contributing to congestion and pollution (Rye, 2010).

Akhuewu (2010) identifies the characteristic of on-street parking which are noted to be the nature of parking which affects the street based on the nature of the environment. He observes that in developed countries like Europe and America, majority of the vehicle owners in a commercial area parked their cars in accordance to the parking principles and guideline. This is because there are provisions of parking space that are enough for both the users of the spaces and those residing within the area. This was as a result of planning with the inclusion of parking facilities to discourage any obstruction on the streets. The various characteristics that are linked with street parking are advantageous due to monitoring and control of street parking in the developed nations of the world. In African context, the nature of street parking is different from the way it is in developed nations.

Norman and Wesley (2008) identified a number of ways by which on-street parking could be of importance. These are:

• **Higher efficiency:** Users of the downtowns consistently select on-street parking spaces over off-street surface lots and garage parking. The on-street spaces experience the most use and the highest turnover.

• **Better land use:** Using the curbside for parking saves considerable amounts of land from life as an off-street surface parking lot. Medium-sized town centers can save an average of more than two acres of land by providing street parking. This efficiency can allow for much higher-density commercial development than the center to rely solely on off-street surface lots.

• **Increased safety:** Drivers tend to travel at significantly slower speeds in the presence of features such as on-street parking and small building setbacks. Slower vehicle speeds provide pedestrians, cyclists and drivers more time to react, and when a crash occurs, the chance of it being life-threatening is greatly reduced. In short, on-street parking can help to create a safer environment. On-street parking can slow automobile traffic, making streets safer for bicyclists and pedestrians. In many communities in Europe, on-street parking is used as chicanes

to make the road appear narrower and slow traffic in residential areas (Christopher, 2006). It can be an effective buffer between vehicle traffic in the street and the pedestrian environment on the sidewalk, making walking more pleasant.

On-street parking also creates potential hazards for bicycles or motorcycles, which are often struck by car doors opening. Children who are too short to be seen through car windows can also dart out into traffic from between parked cars (Christopher, 2006) and (Olorunfemi, 2013). In order to allow easy movement in the city, there is need for proper monitoring and transportation system must include adequate parking facilities in all places that attract vehicle traffic (Asiyanbola and Akinpelu, (2012)) and (Olorunfemi 2013). Asiyanbola and Akinpelu, (2012) opined that the argument in the literature is that the provision of parking for all automobile must be widely recognized as a responsibility where adequate facilities are not otherwise provided. He stressed that major attention should be on on-street parking for passengers cars as parking needs to reduce traffic congestion in a city.

3.0 Research Locale

Lokoja is a city in the North Central section Nigeria and is the capital city of Kogi State with a population of 195,261 people (NPC, 2006). Lokoja is one of the oldest cities in Nigeria before it became the State Capital in the year 1991 (KSMC, 1991). Lokoja enjoyed a great deal of prominence as a trading port in the past during the period of boom of Europeans commercial activities and essentially as a Confluence city surfing traffic from both River Niger and Benue and the Atlantic Ocean. The city benefited from the United Trading Company (UAC) activities being the largest company to operating in Lokoja as at that time and the company constructed its Wharf for off-loading their goods for importing and exporting. The decrease in volume of water flow as a result of dam construction across the Country prevented their ship from coming to Lokoja, as a result of that the Company folded up in 1863 and their warehouses were abandoned. Lokoja lies on longitude 7^0 48N and latitude 6^044^0E and is approximately 162 kilometers from Abuja, the seat of the Federal Government of Nigeria, 65 kilometers from Kabba and 52 kilometers from Okene.

However, for the purpose of this study, emphasis will be on the following identified areas in Lokoja where on-street parking is prominent vis-à-vis traffic congestion: Ganaja-Lokongoma Road, Old Market-Felele/New Market Road, Local Government-Post Office Road and Ibrahim Babangida-Murtala Mohammed Road. The predominant parking noticeable in Lokoja includes on-street parking and commercial activities, on-street parking and religious activities, on-street parking and governmental activities. Though there is an off-street parking arrangement in some of the locations understudy, but due to city growth, expansion, increase in vehicle, (both private and commercial), increase in population, economic and commercial activities coupled with weak regulatory agencies resulting in indiscriminate conversion and mix-use of land uses without adequate parking spaces. Consequently, the socio-economic malaise of the aforementioned is on-street parking which invariably causes traffic congestion especially during peak period and market days within the Lokoja city. The figures 1 and 2 below show the map of Lokoja in the National setting and the study locations in Lokoja.

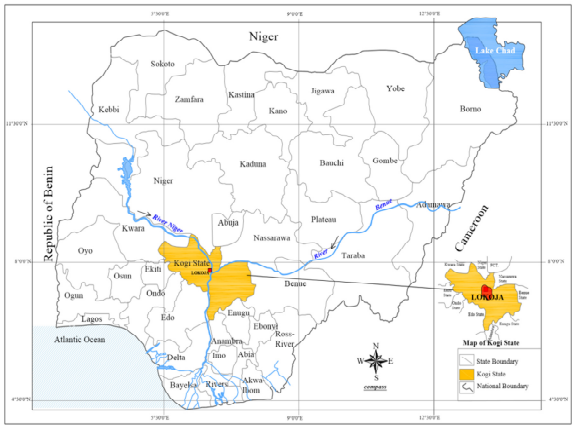

Figure 1: Map of Nigeria showing kogi state and Lokoja in the National Setting.
Source: Kogi State Ministry of Land and Environment, Lokoja, 2012

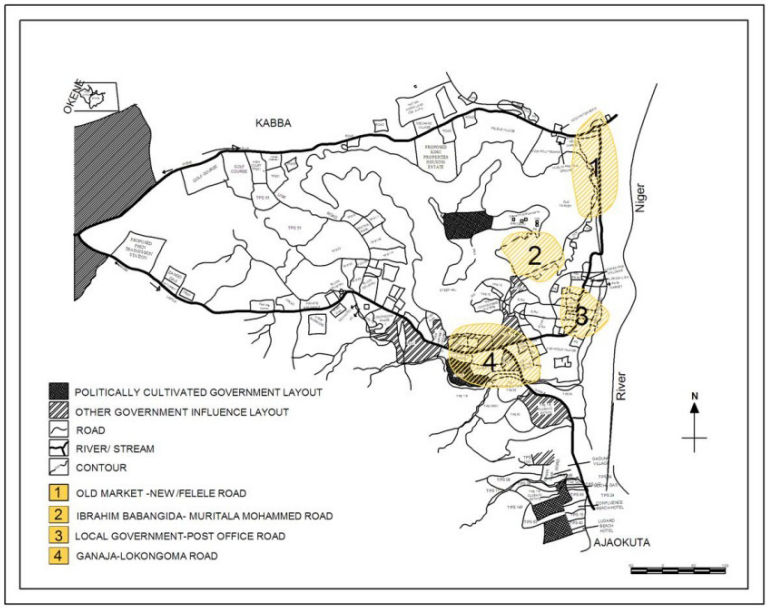

Figure 2: The Study Locations in Lokoja.
Source: Kogi State Ministry of Land and Environment, Lokoja, 2012.

4.0 Research Methodology

The populations for this research work comprises of commuters, drivers of parked cars on the street/road, national union of road transport workers (NURTW) and owners of shops where on-street parking is noticed, as well as road safety and traffic warden officers in Lokoja. The research instrument used is the questionnaire which was structured to address the aim and objective of the research and was randomly distributed within the research population. In order to achieve the above, the researchers and their field assistants involved in a volumetric count of parked vehicles and commuters in the locations of study in Lokoja. The shops in each of the locations were also count because this constitutes the major commercial activities in the area that has warranted habitual parking of vehicles and results to traffic congestion in the area.

Meanwhile, the sample size was determined through volumetric count of the parked vehicles, commuters and shops in the locations of study as stated above and 10% of the result was sampled in all which amounted to 727 sample size (174 for parked vehicle owners, 451 for shop owners and 102 for the commuters). Systematic sample method was used and a respondent was picked at every 11^{th} interval of the parked vehicle owners and shop owners as well as commuters respectively. A questionnaire was also designed to elicit information from the Chairman of National Union of Road Transport Workers (NURTW), Unit Commandant of Traffic Warden Department of Nigerian Police and Sector Commandant of Federal Road safety Commission in Lokoja. The analysis of the sample size for parked vehicles, shops owners and commuters at each location is shown in table 1.

Table 1: List of Shops and Average number of Parked Vehicles and Commuters Count at the Location of Study in Lokoja

Location	Average No of Commuters	No of Commuters Sampled 10%	No of Shops	No of Shops Sampled (10%)	Average No of Parked Vehicles	No of Parked Vehicles Sampled (10%)	Availability of Parking Space
Ganaja and Longokoma Road	234	23	846	85	356	36	Not available
Old Market and Felele/New Market Road	535	54	2639	264	1131	113	Available but not Enough
Local Government and Post Office Road	151	15	300	30	102	10	Not Available
Ibrahim Babangida and Muritala muhammed Road	95	10	715	72	150	15	Not Available
TOTAL	**1015**	**102**	**4500**	**451**	**2039**	**174**	

Source: Authors' Field Survey, 2013

Data analysis was carried out with the aid of Computer aided Statistical Package for Social Science (SPSS) Version 16. The technique used was univariate analysis which is a single variable analysis that describes the necessary feature of the sets of data.

5.0 DISCUSSION AND FINDINGS

5.1 Socio-economic Status of the Respondents

Olorunfemi and Basorun (2013), noted that authors such as Okoko, (2006); Maitri and Sarkar, (2010); Basorun and Rotowa,(2012); have fully established in literature that trip is usually affected by factors such as sex, income, age, occupation etc. However, from the analysis (appendix 1) it was discovered that male (66.1% for parked vehicle owners and 53.7% for shop owners) are more than female in the study location except that of commuters where majority of the respondents are female. This is because they are mostly involved in trading activities to sustain and support their men in the provision of domestic needs to the families (Olorunfemi and Basorun 2013). Although, it has been confirmed that male are more in the study area than female (NPC, 2006). The age distribution of the respondents shows that majority of commuters are between 25-34 years (34.3%), 43.7% fall between 35-44 year among the parked vehicles owners while 33.3% are between the age of 35-44years among the shop owners respectively. This indicates that age bracket significantly has influence on the mobility and quest for a living and trading activities in Lokoja.

The education status of the respondents revealed that majority of them had secondary school education (38.2% for commuters, 54.6% for parked vehicle owners and 44.3% for shop owners). This may be the reason why majority of them engage in one business/commercial activities or the other. Although, this is the limit of free education in Nigeria and where education is still affordable by the average poor. In most cases, those who meet requirements for higher education give up at this stage for businesses because of the cost involved (Basorun, 2004). The income level of the respondents was different from each other, it was discovered that majority of the parked vehicle owners (47.1%) and shop owners (69.2%) earn between ₦151,001- ₦200,000.00 annually while majority of the commuter disclosed that they earn between ₦101,001- ₦150,000.00 annually. In fact, looking at the economic situation of the country today the annual income claimed by respondents may not be commensurate with their standard of living and this suggests why some of the shop owners choose to display most of their items on the road set back,(meant for parking) using illegal shops and kiosks.

Findings revealed that majority of respondents (31.4% for commuters, 48.9% for parked vehicle owners and 49.0% for shop owners) engage in business/commercial trip per day. It has been widely stressed in the literature among authors such as Okoko (2006) and Basorun (2004) that trips to business/commercial areas generate enormous traffic than any other activities area of the city. In connection with the above, Obot and Umoh, (2007), opine the number of trips made per day increases the chance of traffic congestion on roads especially during trips to churches, offices, markets, shops, sport centers and other places which often generate enormous parking demand. As observed by Okoko (2006), the greater the number of attractions (shops, offices, work places etc) in an area the more traffic that will be attracted. This assertion has really manifested in the study coupled with inadequate traffic management and parking spaces that have resulted to traffic congestion experience in Lokoja.

5.2 Mode of Transport used by the Respondents

It was discovered in the study area that majority of parked vehicle owners (54.6%) and shop owners (43.0%) use private cab/vehicle mostly as their means of transportation as majority of commuters (40.2 %) rely on public car. This shows that majority of the shop owners and parked vehicle owners in the study use their personal cars as a means of transport as reasonable number of them also plighted through public cars which contributed to the on-street parking scenario in the study. In corroboration Rye (2010), argues that increases in number of private vehicles or car will amount to high traffic volume of vehicles on road which may results to high demand for parking at the destination points and if not available (parking spaces) may disintegrate to on-street parking. He therefore suggested that parking should be pricing or charged. Alternatively introduction of park and ride method is a means of discouraging the private car owner's particularly to the city centers.

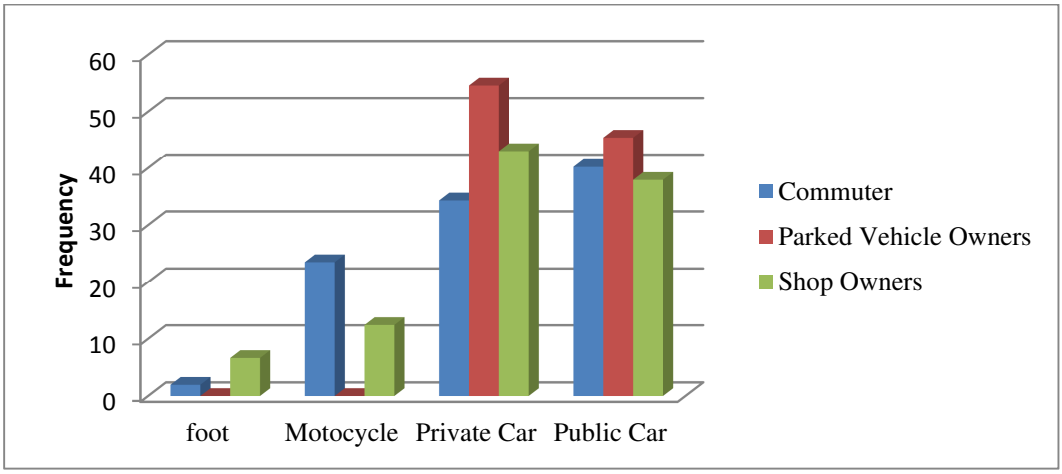

Figure 1: Mode of Transport used by the Respondents
Source: Authors' Field Survey, 2013.

5.3 Availability of Parking Space and Traffic Devices in Lokoja

*P*arking spaces are important in accommodating residents where they live, in promoting the accessibility of commercial land for customers, and allowing employees ready access to their places of work. As the number of automobile travel increases, there arises the need for parking space at various locations (Richard and David, 2007). The benefits of parking space and management may manifest themselves in many ways including better public spaces and reductions in traffic levels (The Region's Development Agency, 2007).

However, in the study it was discovered that there are parking spaces but of low quality and most of the places claimed to be parking space have been converted to other use and some have been occupied by market sellers in the area. The inadequate or improper management of parking spaces in Lokoja has propel many to parked along the road including the public transport operators for uploading and offloading of their goods and passengers while majority of the respondents claimed, to take off at a convenient time is the reason for parking on the road. This act has constituted to the problem of road congestion in the study area as majority of the respondents revealed that delay in traffic movement/waste of time and accidents were major aftermath effect of the problem in Lokoja particularly on the market days. In agreement with the above, Akehuewe (2010) and Olorunfemi (2013), argue that traffic congestion that is usually experienced in Nigerian city today coupled with inadequate or ineffective parking spaces propel majority of people to park on road side in order to live at a convenient time without any further delay especially those who live in a far distance to their working places.

Meanwhile, an adequate survey of the traffic devices in the study area was also conducted, among which are the traffic light, traffic sign/signal, road sign and marking, bus stop etc that should aid traffic management in the area and was discovered that most of it are not effective. This has led to accident and congestion in most time at the study area due to the impatience of the motorist and motorcycle operators. In most cases, the traffic warden and road safety officers are usually stationed to the locations to reduce congestion problem. At times, the negligence of the officers also caused accident or congestion as majority of the respondents opines that some of the officers collect bribe from the motorist and motorcycle operators that violate traffic rules and this has worsen traffic management system in Lokoja.

Apart from the above, the narrow nature of most of the roads in Lokoja as a result of poor construction and designed coupled with inadequate set back from structure/buildings to the road was also observed to have contributed to the problem of traffic congestion and delay in the area (see table 2). However, based on the above mentioned, the respondents gave the following suggestions on ways to improve traffic condition in the study area which includes: enlightenment Campaign on the use of road for motorists, motorcycle operators and pedestrians,

provision of more public parking spaces at some distance away from the roads (Off-Street Parking), effective development Control measures to be instituted by Town planning Officers and effective traffic Control Measures should be put in place.

Table 2: Traffic Delay in Lokoja

Traffic Delay	No of Respondents	Percentage
Less than 10 Minutes	223	31.0
10-20 Minutes	405	55.7
20-30 Minutes	64	8.8
Above 30 Minutes	35	4.8
Total	727	100.0

Source: Authors' Field Survey, 2013.

6.0 Conclusion and Recommendations

The study has appraised the menace of on-street parking and traffic congestion in Lokoja, and it has been seen that parking problems and traffic congestion are ostensible in the area due to it land use pattern coupled with inadequate parking spaces/facilities and ineffective of the traffic devices in the area. Due to fact, that the study area is an intervening city between Abuja (the Federal Capital Territory), Lagos and Eastern part of the country which is imbedded with a lot of commercial activities and has generated a lot of vehicular and pedestrian traffic. Therefore, demand for parking spaces and other facilities are high. The inability of the existing situation to survive with the demand has later led to parking problem and traffic congestion. However, to allow easy vehicular movement in the study area, Lokoja Local Government in conjunction with the state government and Local Planning Authority in the area should specify and enforce the provision of parking space into any structure (Building) be it commercial or residential before approval while all old buildings along the road in the study locations should be renovated to accommodate adequate parking space. This will reduce the current situation of traffic congestion and also forestall future occurrences.

Government should embark on public awareness campaign and enlightenment programme as a basic mechanism for accomplishing effective traffic management control. This will further assist in solving the problem identified in Lokoja, because most of the motorist and motorcycle operators are not conversant with the traffic rule and regulation. In most cases, disobedience to traffic signs/signals resulted to traffic congestion in most of the roads. On account of this, government should adopt stiff penalty measures on on-street parking and traffic offenders, which will be communicated to the people. To achieve this, the programme should be anchored by traffic warden officers, road safety officers and other agencies involved in the regulation and control of traffic within the city with the support of local and state government. This could be done through public enlightenment campaign or either by announcement round the city or through mass media such as radio, television, new papers, and internet etc.

Adequate enforcement of traffic rules and regulations by disciplined law enforcement agent should be instituted. Oftentimes, indiscriminate use of road facilities is very common amongst motorist, cyclists and pedestrians and very often, the uncoordinated manner through which the road system is used creates further problem. Thus, called for an effective ways of enforcement to curtail the activity. To this end, Police and the traffic Management Authorities are the frontlines in traffic laws. They should be mandated to enforce the rules and regulations binding the vehicular traffic operations without any fear or favour in order to mate out penalties and punishment to defaulters (Osoba, 2012)

Government should develop a mean through which some activities that propel on-street parking in Lokoja will be relocated to another area within the city. Government should also expand the road network of Lokoja in order to allow easy flow of movement. This should be complement with introduction of intelligent transport system based on information technology such as use of computers and other information technological devices like communication gadgets, Bluetooth and radar for traffic monitoring are highly relevant for solving complex issues relating to parking problem and traffic management.

Off-street parking facilities/spaces should be provided at designated areas of the study area. Insufficient off-street parking facilities results in on-street parking which reduces the effective width of roads, thus leading to obstruction of traffic flow. This type of parking space is not located on road side, in which any member of the public can park. It should be constructed with the mandate of specific regulations (e.g. maximum stay hours or minutes, payment of fee etc) and can be operated by public or private sector or organization. It promises to provide accessibility for people to visit downtown or any places within the city because the people are confidence of where to park.

In Lokoja, most of the roads are characterized by narrow road, which creates problem for easy vehicular movement along the narrow corridors. The adoption of traffic management techniques such as road capacity

enhancement scheme, one way street system, traffic sign, pedestrians safety measure, vehicles parking regulations and controls, modernization of junction control, routing and operational policies for heavy duty vehicles. These will help in reducing traffic congestion, accidents and on-street parking in the area. However, if all the recommendation mentioned above are fully implemented, the problems of on- parking and traffic congestion in Lokoja will be a thing of the past.

References

Aderamo.A.J. (2012).Urban transportation problems and challenges in Nigeria: A planner's view. *Prime Research on Education* Vol.2(3)

Aderamo, A. J and Atomode. T.I. (2011) Traffic Congestion at Road Intersection in Ilorin, Nigeria. Australian Journal of Basics and Applied Sciences, 5 (9). 1439-1448.

Akhuewu. (2010): *Impacts of On-Street Parking on Commercial Activities in Auchi.* Unpublished HND Dissertation, Department of Urban and Regional Planning Federal Polythenic Auchi, Nigeria.

Allison L.C (2002). Dynamics of On-Street Parking in Large Central Cities. *Rudin Center for Transportation Policy & Management*, NYU Robert F. Wagner Graduate School of Public Service 4 Washington Square North New York, NY 10003.

Asiyanbola R.A, Akinpelu A.A (2012).The challenges of on-street parking in Nigerian Cities' transportation routes . *International Journal of Development and Sustainability.*

Bashiru, A. R. and Waziri, O. O. (2008). Analysis of intra-Urban Traffic Problems in Nigeria : A study of
Lagos Metropolis. Indonesian Journal of Geography 40 (1), 31 -51.

Basorun J.O (2004). *Basic Element of Urban and Regional Planning.* Akure Shalom Publisher.

Basorun J.O and Rotowa O.O (2012). Regional Assessment of Public Transport Operations in Nigerian Cities: The Case of Lagos Island. *International Journal of Developing Societies Vol. 1, No. 2, 2012, 82-87*

Bruton M.J (1975). *Introduction to Transportation Planning,* Hutchison Educational Ltd.

Christopher J. Z (2006). *Parking Management in Curitiba, Brazi* Carolina Papers International Development of University center for international studies, 223 East Franklin Street, CB # 5145, UNC-CH Chapel Hill, NC 27599-5145.

Fadairo .G. (2013) Traffic Congestion in Akure, Ondo State, Nigeria: Using Federal University of Technology Akure Road as a case study. *International Journal of Arts and Commerce Vol. 2 No. 5*

Jeffrey F.P (2007). *Advance Parking Management System: Taking the Street out of Parking*. Published by Intelligent Transportation System, Washington D.C, U.S.A.

Kogi State Ministry of Commerce and Industry (1991). *Investment Guide for Potential Investors.* Produced by the State Ministy of Commerce and Industry.

Maitri V. and Sarkar P.K. (2010). *Theory and Applications of Economics in Highway and Transport Planning*. Standard Publishers Distributors, Delhi, Indian

Norman W. G and Wesley.M, (2008).*What Street Parking can do for Downtowns.* Retrieved on November 10, 2013, from http://www.courant.com/archives and www. hartfordInfo.org on 23/11/13.

National Population Census (2006). Compressive Result of 2006 Population census. Retrieved on November 15, 2013, from www.google.com

Obot J.U, Etim E.E and Atser.J (2009). Intra-Urban Traffic and Parking Demand in Uyo Urban Area .*Global Journal of Social Sciences vol* 8, no.2,: 61-68.

Obot, J. D. and Umoh, (2007). Problems and Prospects of Intra-City Transportation in Urban Nigeria; A case Study of Uyo Metropolis in eds , O. B. Ekop; E. Etim and J. D. Obot; *physical Development of Urban Nigeria; Emerging Trends and Challenges, Universal Developmental Consortia*, Ikot Ekpene; Pp 122-142

OECD (1973). *Road Research.* Proceedings of the Symposium on Techniques of Improving Urban Congestions by Restraint of Road Traffic held at Cologne Germany 25th – 27th Oct. 1971, Organization for Economic Corporation and Development, Paris.

OECD (Organisation for Economic Cooperation and Development) and ECMT (European Conference of Ministers of Transport). Joint Transport Research Centre (2007).*Managing Urban Traffic Congestion.* Published by OECD and ECMT, Bedfordshire United Kingdom.

Ogunbodede, E.F (2003) Assessment of Traffic Congestions in Akure (Nigerian) Using GIS Approach :Lessons and Challenges for Urban Substances. *Indian Journal of Transport Management.* Vol.27 No 3 pp305-322.

Okoko E.E. (2006). *Urban Transportation Planning and Modeling.* Akure, Millennium Publisher.

Olorunfemi S.O and Basorun J.O.(2013). Appraisal of Regional Mobility in Lokoja, Nigeria. *Journal of Society and Communication* pg 420-446

Olorunfemi S.O (2013).*Assessment of On-Street Parking in Lokoja, Nigeria.* Unpublished Master Thesis, Department of Urban and Regional Planning, Federal University of Technology Akure, Nigeria.

Osoba B.S (2012). Appraisal of Parking Problems and Traffic Management Measures in
Central Business District in Lagos, Nigeria. *Journal of Sustainable Development;* Vol. 5, No. 8

Raji B. and Waziri. O. (2008): Analysis of Intra-Urban traffic problems in Nigeria: A study of Lagos Metropolis. *Indonesian Journal of Geography* 40(1): 31-51

Richard D.D and David M.L (2007): *Transportation: Street, Parking, Public Transportation and Air Ports.* Country and Municipal Government in North Carolina.

Sivasubramanian. J and Malarvizhi. G (2007). *A System Dynamics Methodology for Assessing Parking Demand for Commercial Shopping Area.* Department of Civil Engineering, Anna University Chennai

Tanimowo, N. B. and Atolagbe, A. M. (2006). Land use and Intra-Urban Travels in Ogbomosho, Nigeria, in eds (J. A.Fadamiro et al,) *Urban Environmental sustainability; Interventions and Responses; Urban Design Research Team*, School of Environmental Technology, Akure. Pp 91-99.

The Region's Development Agency (2007). Car Parking Research. A detailed Report on how Parking can be Managed in the Region's Market Town. Published by the Region's Development Agency Leeds.

Rye, T. (2010). *Parking Management: A Contribution towards livable cities.* Module 2c, sustainable transport: A source book for policy makers in developing city. Published by gtz transport advisory services.

Weant R.A. and Levinson H.S (1990). *Parking* Foundation for Transportation.

Appendix 1: Socio-Economic Status of the Respondents

	Socio-Economic Status of the Respondent	**Commuters**		**Parked Vehicle Owners**		**Shop Owners**	
S/N	**Sex Distribution**	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1.	Male	41	40.2	115	66.1	242	53.7
2.	Female	61	59.8	59	33.9	209	46.3
	Total	**102**	**100.0**	**174**	**100.0**	**451**	**100.0**
	Age Distribution						
1.	15-24 Years	20	19.6	6	3.50	34	7.8
2.	25-34 Years	35	34.3	33	18.9	79	17.5
3.	35-44 Years	27	26.5	76	43.7	158	33.3
4.	45-54 Year	15	14.7	47	27.0	149	33.0
5	54 Years and Above	5	4.90	12	6.9	38	8.4
	Total	**102**	**100.0**	**174**	**100.0**	**451**	**100.0**
	Educational Status						
1.	No Formal Education	15	14.7	8	4.60	16	3.50
2.	Primary School	28	27.5	25	14.4	71	15.7
3.	Secondary School	39	38.2	95	54.6	200	44.3
4	Tertiary	20	19,6	46	26.4	164	36.4
	Total	**102**	**100.0**	**174**	**100.0**	**451**	**100.0**
	Annual Income						
1.	Below N100,000.00	29		28	16.1	20	4.40
2	N101,001-150,000.00	51		54	31.0	34	7.50
3.	151,001-200,000.00	18		82	47.1	312	69.2
4	Above N200,000.00	4		10	5.80	85	18.8
	Total	**102**		**174**	**100.0**	**451**	**100.0**
	Trip Made Per Day						
1.	Religion	11	10.7	9	5.20	30	6.70
2.	School	30	29.4	31	17.8	35	7.81
3.	Work	29	27.5	49	28.2	165	36.61
4.	Business/Commercial	32	31.4	85	48.9	221	49.0
	Total	**102**	**100.0**	**174**	**100.0**	**451**	**100.0**

Source: Authors' Field Survey, 2013.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Recent conferences: http://www.iiste.org/conference/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar