The Challenges of Urban Mobility in Kogi State, Nigeria.

Samuel O. Olorunfemi[1], Enobng E. Okoko[2], and Kolawole T. Gbadamosi[1]
Department of Logistics and Transport Technology,
School of Logistics and Innovation Technology,
Federal University of Technology, Akure[1]
and
Department of Urban and Regional Planning,
University of Calabar, Calabar[2]

Abstract
Since the conception of the world, mobility has become inevitable for man to satisfy his social, economic and political needs. Regrettably, today, mobility has been mired in most of the urban centres in the world due to some challenges emanating from poor coordination of the existing urban systems. These challenges threaten mobility and deny urban dwellers maximum satisfaction while embarking on their daily trips. To this end, this study assessed challenges impeding urban mobility in selected urban centres in Kogi State, Nigeria, using a structured questionnaire and personal field observation. Using a systematic sampling method, the structured questionnaire was administered to thousand two hundred fifteen (1,215) household heads in the study area to elicit their perception of the challenges militating against urban mobility. The collected data were analysed using descriptive statistics in the form of frequency counts and percentages. Findings revealed that traffic congestion was the most striking impedance to urban mobility in Okenne and Lokoja; poor quality of road transportation inhibits seamless mobility in Ankpa and Ajaokuta; poor road condition dotted Dekinna, Mopa-Amuro and Bassa-Oguma urban space; and high cost of transportation was manifestly standard in Adavi and Kabba-Bunu. From the preceding, it is recommended that the government develop modern transportation systems that are safe, secure, comfortable and affordable for urban dwellers. Also, there is a need for a standard road capacity framework for road construction, rehabilitation and maintenance across the urban centres in Kogi State. Efficient and effective implementation of the above will significantly enhance urban mobility in the selected urban centres in Kogi State and, by extension, across all the urban centres in Nigeria.

***Keywords**: Challenge, transportation, urban mobility, Kogi State, Nigeria.*

1.0 Introduction
Since immemorial, mobility across geographical space has been integral to human activity for leisure, comfort, and meeting other needs. People's needs are closely reflected in social, political, and economic interaction. As such, it becomes a paramount issue for urban planners and transport planning experts to ensure sustainable mobility. Arup Climate Group (n.d) remarked that people need to move around to source for basic human needs; mobility is a frill, contributing to the quality of life by allowing exploration, leisure and recreation. Since the beginning of the industrial revolution, in which transportation has been among the prime factors, human settlements have been growing and expanding at an alarming rate regarding territorial space and population (Fasina et al., 2020). Even though the development of modern cities such as New York, Los Angeles, Peking (Beijing), London and Berlin, among others, was anchored on the Industrial Revolution as revealed by Boareto (2003), Un-habitat (2013),

Fasina et al. (2020); the functions of mobility and accessibility provided by transportation boosted the importance of those cities as people continually exploit socio-economic possibilities in them (Un-Habital, 2013; Fasina *at el.,* 2020).

In the city, high-quality mobility is essential for the success of other urban sectors and the creation of jobs, and it plays a prominent role in cultivating an attractive environment for residents and businesses. However, mobility is widely cited as one of the most intractable and universal challenges cities face worldwide (Arup Climate Group, n.d). Montana and Fafael (2016) noted that constant increases in urban mobility have caused particular circulation, parking, traffic congestion, noise, and other pollution problems, profoundly affecting the quality of human life. About the above, Arup Climate Group (n.d) emphasised that as the urban populations increase, existing and emerging cities face the challenge of meeting rising demands for efficient mobility within limited physical infrastructure capacity. According to Sudhakara & Balachandra (2012), urbanisation has been discovered as one of the significant challenges of the 21st century owing to the high population and resources in cities. As the economies grow and cities expand, there is a considerable increase in transportation needs. Kenworthy (2008) argued that many towns are automobile-dependent, with established rates of automobile ownership and mass transit. Kenworthy (2008) and Sudhakara & Balachandra (2012) remarked that the increasing urbanisation rates in developing countries with the pooled effect of population upswing, rapid economic growth, increased mobility and vehicle ownership are a cause for concern. Despite the importance of transportation, its inherent problems, especially road transportation, pitched into tumult of public controversy and subject to the whimsies of political, economic and social expediency (Osuji & Onyenechere, 2013).

Sustainable mobility in urban areas is crucial for the smooth operation of the local and national economies (Yannis & Constantinos, 2013). Congestion, accidents, delays, air pollution, noise, and infrastructure damage are some of the significant adverse effects of urban mobility. Urban traffic is responsible for 40% of carbon oxide (CO_2) emissions and 70% of other pollutants from road transport (European Commission, 2007). Furthermore, the European Commission (2007) also noted that the number of road traffic accidents in towns and cities is increasing every year: one in three fatal accidents now happen in urban areas, and it is the most vulnerable people, namely pedestrians and cyclists, who are the primary victims. The management of road transportation systems in some world cities is poor, which aggravates the suffering passengers go through while commuting (Ohakwe & Ezirim (2006). Evidence from Nigeria and other developing nations shows that most urban centres' road infrastructure needs to be more robust regarding the number provided, capacity required, and maintenance needed. This, in turn, gives rise to over-loading of vehicles, traffic congestion, surface wear-off of the roads, and road traffic accidents (Basorun & Rotowa, 2012; Osuji & Onyenechere, 2013).

The above is also true of Kogi State, an intervening State between the Northern, Southern and the Eastern part of Nigeria. It usually absorbs more traffic from all parts of the country with attendant road transport problems. Olorunfemi (2020) affirmed that roads across Kogi State are grossly inadequate, as potholes, poor quality transport services and inadequate sub-infrastructure such as drainage systems, bus stops, parking facilities, bridges, and street lights characterise most. The above cumulatively hindered efficient and effective mobility. Against this background, this study assessed urban mobility challenges in Kogi State, Nigeria, to suggest sustainable strategies for improved urban mobility.

2.0 Literature Review

Mobility is an indispensable human need. Human survival and societal collaboration depend on the ability to move people, goods, and services within rural or urban areas. Urban mobility can be viewed as the movement of people or freight in a metropolitan area and revolves around all urban transportation systems (Rodrigue, 2017). Undoubtedly, efficient mobility systems are essential facilitators of economic development. Cities could not exist, and global trade could not occur without systems that could transport people and goods cheaply and efficiently (World Bank, 2002). Owning to the increase in human activities across the globe that warrant constant mobility, it is noteworthy that the last twenty years have experienced massive growth in the number of cars, bikes, motorised two-wheelers and para-transit vehicles (such as minibuses) in many developing countries (Olorunfemi, 2020). Corroborating the above, Okoko (2018) stated that vehicle ownership is rising at a rate of 15 to 20 per cent annually in much of the developing world as more people travel, live and work in cities. However, the necessary transport infrastructure such as roads, pavements, bus stops, bike lanes, lay-by, public transport, traffic management, drainage systems, parking facilities, traffic lights, street lights and emissions controls are developing more slowly, generating congestion, pollution and high accident rates posing a severe threat to mobility.

Fasina *et al.* (2020) declared that the importance of transportation as an unavoidable interface, irrespective of the demographic class, cannot be overemphasised as it principally facilitates vital links for accessibility and mobility for all and sundry appropriately and safely (Badejo, 2014; Bimal, 2014; Salisu, 2019). Despite the noticeable significance of transportation to the socio-economic development and prosperity of any city, urban transit, most especially in third-world countries including Nigeria, is still encumbered with numerous accessibility and mobility issues which are directly connected with the increasing and unguided population agglomeration and urbanisation, industrialisation and land-use changes (Fasina *et al.*, 2020).

Basorun (2005) identified the reasons for mobility within an area or region, including business, education, health, recreation and visits to family and friends. In Europe, for example, between 1990 and 2010, passenger transport in the EU27 increased 35% to 6.4 billion passenger kilometres, which is, on average, almost 13,000 km per person. From the total

passenger kilometres, passenger cars accounted for 73.7%; buses and coaches 7.9%; railways 6.3%; powered two-wheelers 1.9%; and tram and metro 1.4%. Intra-EU air and intra-EUmaritime transport contributed 8.2% and 0.6%, respectively (European Union, 2013). In India, according to Sanjay (2006), road-based passenger mobility has increased tremendously over the years. From 1950-51 to 2000-01, passenger mobility rose from 36 billion passenger-kilometres (BPKm) to 3079 BPKm due to a more than 30-fold increase in annual distance travelled by the people (from 100 in 1950-51 to 3021 Kms in 2000-01) and a 2.84-fold rise in population (from 359 million in 1950-51 to 1019 million in 2000-01). It is interesting to know that between 1980-81 and 2000-01, in light of a 50% population growth, motorised mobility by road in India has risen by 425% (from 585 to 3079 BPKm).

In many African countries, especially Nigeria, a sprawling environment has increased commuters' volume and trip lengths, of which 95% of such trips are carried out on the road (Oni, 1992; Asenime, 2008; Asenime, 2013). Over the years, these vast movements of commuters have put considerable pressure on the existing transport infrastructure, resulting in severe deterioration of the infrastructure and the environment (Asenime, 2013). This manifests in the massive daily traffic congestion experienced during peak hours, with a loss of productive person-hours, stranded passengers, and endless waiting for buses that take too long to arrive (Asenime, 2008).

Over the years, several authors have researched urban mobility. Some of these authors look at the travel pattern of commuters, transport infrastructure, and commuter's safety and comfort, among others. Fasina et al. (2020) studied Intra-City Mobility and Characterization in the Fast-growing City of Lagos, Nigeria. The author used a questionnaire to collect data from 182 commuters, which was analysed using descriptive and inferential methods. The study revealed variations in socioeconomic parameters of intra-city trip makers and factors influencing trip making. It was observed that journeys to work, school, shopping cum business formed the significant reasons for trips to Lagos. However, the author failed to identify challenges encountered by commuters in the study area.

Solanke (2013) examined urban transportation challenges in Nigeria and discovered that rapid growth and uncontrolled horizontal motion of cities are essential for urbanisation in Nigeria. In conjunction with inadequate transport infrastructure and services, the above has made the urban transportation system chaotic, complex and almost intractable. Nevertheless, the study needed to analyse the results to reflect the findings empirically.

Okoko (2009) worked on global cities and the quandary of mobility using the P3 paradigm as a panacea in Lagos megacity. The study investigated the role of the Lekki Concession Company. This private firm entered into a Public-Private Partnership on a Build-Operate-and-Transfer arrangement, with a conception period of 30 years, with the Lagos State Government. The study indicated that before the BOT arrangement, the state of road infrastructure in the

area could have been better, with crumbling sidewalks, badly pot-holed road surfaces, non-functional traffic lights, poor signage and blocked or non-existent drainage systems. The study revealed that the company provided high-quality road infrastructure and related services along the Lekki peninsula axis in Lagos. Specifically, the LCC ensured greater ease and convenience in commuting, reduced journey time, improved road safety through better street lighting, reduced traffic congestion, attenuated the cost of motorists and abated wear-and-tear on motor vehicles. The study advocated replicating PPP projects to provide transportation facilities in other parts of Lagos metropolis and Nigeria to enhance urban mobility.

Hyodo, Montalbo, Fujiwara, and Soehodho (2015) observed that several factors, such as the level of motorisation, availability of facilities, city structure, the pace of economic growth, and local culture, among others, influence transportation demand. Notably, where there is commotion between the above factors, as opined by Hyodo et al. (2015), there will be many challenges to be encountered by people as the need for mobility arises. These noticeable challenges stand as the research gap this study aimed to address to suggest better measures to improve urban mobility and trip-making for the safety and comfort of commuters.

3.0 Study Area

Kogi State, Nigeria, was carved out of Kwara State and Benue State in 1991 and is one of the major states in the central region of Nigeria with a population of 3,314,043. The state was created by General Ibrahim Babangida, the then Military President of Nigeria. It is popularly called the Confluence State because the confluence of River Niger and River Benue is at its capital, Lokoja, which is the first administrative capital of modern-day Nigeria. Kogi State is between latitudes $7^{o}30^{1}$N - $7^{o}52^{1}$N and longitudes $6^{o}38^{1}$E – $6^{o}42^{1}$E. Agriculture and fishing are the mainstay of the economy. The State is blessed with mineral resources such as limestone, coal, marble, and iron ore,

There are three main ethnic groups and languages in Kogi; these are Igala, Ebira, and Okun (Yoruba Group) with others such as Bassa-Nge, a people of Nupe extraction in Lokoja and Bassa Local Government Area, Bassa-Komo of Bassa Local Government Area, Gwari, Kakanda, Oworo people(A Yoruba Group), Ogori, Magongo, and the Eggan community under Lokoja Local Government. Kogi State consists of twenty-one (21) local government areas, and these are Adavi, Ajaokuta, Ankpa, Bassa, Dekina, Ibaji, Idah Igalamela-Odolu, Ijumu, Kabba/Bunu, Koton-Karfe, Lokoja, Mopa-Muro, Ofu, Ogori/Magongo, Okehi, Okene, Olamaboro, Omala, Yagba East and Yagba West. The modes of transportation in the state include road and water transportation. Kogi State connects the Federal Capital Territory with Nigeria's South Western and South Eastern States. Being near the Federal Capital Territory, Abuja International Airport is the national and international gateway for air travellers from and to the state. The notable farm produce in the study area are coffee, cocoa, palm oil, cashews, groundnuts, maise, cassava, yam, rice and melon. The state is home to the largest iron and steel industry in Nigeria, known as Ajaokuta Steel Company Limited, located

in Ajaokuta, and the largest cement factory in Africa, located in Obajana, Lokoja Local Government Area

Figure 1: Map of Nigeria showing Kogi State.
Source: Kogi State Ministry of Works and Urban Development, Lokoja (2018

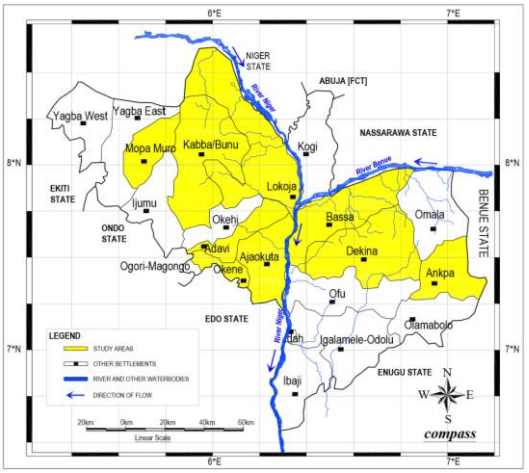

Figure 2: Map of Kogi State Showing Selected Urban Centres for the Study
Source: Kogi State Ministry of Works and Urban Development, Lokoja (2018)

4.0 Methodology.

Both primary and secondary sources of data were used for this research. Personal observation and structured questionnaires were the primary sources of data utilised. The population census figure of Kogi State sourced from the National Population Commission in Lokoja was used as the secondary data. To determine the sample size for the research, the population census results in 2006 of the selected urban centres in the study area were sourced and summed up to 1,717,087 (NPC, 2006). This was projected to 2017 at a growth rate of 2.8%; this amount to 2,321,140, from which 1,658 of the household heads were sampled with the aid of structured questionnaires using a systematic sampling method. From the sampled household heads, 1215 questionnaires were retrieved, analysed and used for this study (see Table 1). The data were presented using descriptive statistics in the form of frequency counts and percentages.

Table: Projected Population of selected Urban Centres in Kogi State from 2006-2017

S/N	Name of Settlements	X1 2006 Population Figure	X2 2017 Projected Population Figure	X3 Household Heads to be Sampled	X4 0.005% of Household Heads (Sample Size)	X5 Number of Questionnaires Received
1	Adavi	217,219	294,332	10,512	210	150
2.	Okenne	325,623	434707	15,525	311	205
3	Ankpa	266,176	360,668	12,881	258	200
4	Dekinna	260968	353,612	12,629	253	195
5	Mopa-Amuro	43,760	59,295	2,117	42	35
6	Kabba/Bunu	144,579	195,905	6,997	140	80
7	Lokoja	196,643	266,451	9,516	190	150
8	Ajaokuta	122,432	165,895	5,925	119	100
9	Bassa	139,687	189,276	6,761	135	100
	Total	1,717,087	2,321,140	82,863	1,658	1, 215

Source: X1 – National Population Commission 2006**;** X2, X3, X4 and X5 – Author's Computation, 2018.

5.0 Findings and Discussion

5.1 *Mode Choice and Purpose of Mobility*

Mode choice is the way through which the means of travelling is determined. The means of travel refers to the travel mode used by individual road user to accomplish their journey. This includes walking, bicycling, motorcycling, and bus and car (private or public). There are various means of mobility available to the urban dwellers in Kogi State (see Figure 1a) that are used for their daily commuting, and the analysis revealed that 2.1% of the urban dwellers move on foot, 5.6% use bicycles, 40.2% relied on cars/buses and 50.4% used motorcycle/tricycle. Going by the above, it is evident that most urban dwellers in the study area relied on motorcycles/tricycles to embark on their daily trips. This is so because of its affordability and propensity to provide door-to-door services compared to car/bus. The above situation has been elucidated by Rietveld (2001) and Gbadamosi and Olorunfemi (2016) that the attractiveness or acceptability of motorcycle/tricycle as an essential means of transportation in most parts of developing countries is predicated on its ability to (i) provide door-to-door transport (ii) complement the concept of multi-modal transport chains, and (iii) serve as a cheap or affordable transport mode. For movement, most urban dwellers (36.6%) revealed that their daily movement is to their place of work, business, and trading engagement, and considerable proportions are generated between 2-3 trips daily.

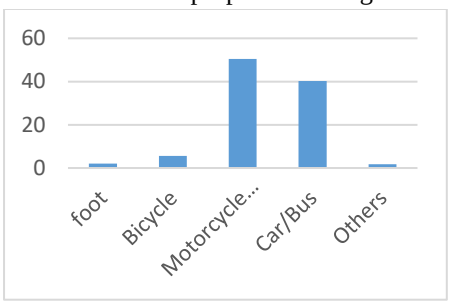

Figure 1a: Means of Mobility
Source: Author's Fieldwork, 2020

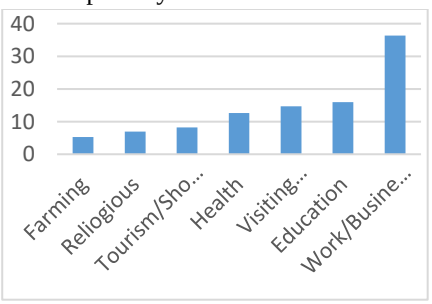

Figure 1b: Purpose of Mobility
Source: Author's Field Work, 2020

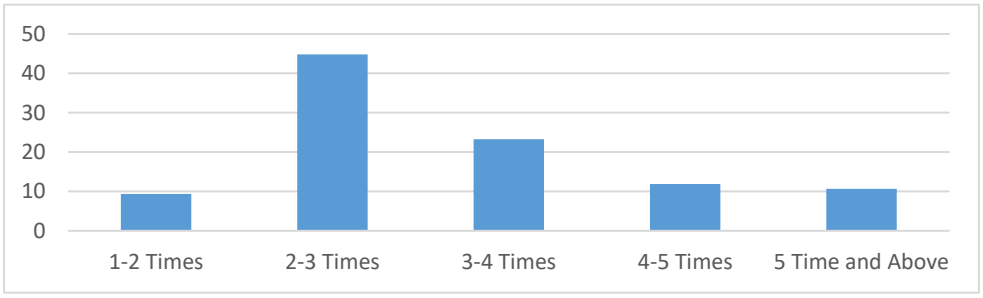

Figure 1c: Frequency of Movement

Source: Author's Field Work, 2019.

5.2. Challenges Impeding Effective Mobility of Urban Dwellers in Kogi State.

From creation, mobility has become inevitable for man to satisfy his social, economic and political needs. Unfortunately, mobility has been hindered in most urban centres due to challenges from poor coordination of the existing urban systems or growth. These challenges threaten mobility and deny urban dwellers maximum satisfaction while embarking on their daily trips. Table 2 reveals the mobility challenges in the Kogi State. The study showed that most of the respondents in Okenne (28.8%) and Lokoja (36.7%) highlighted traffic congestion as the significant factor impeding urban mobility. Most of the respondents in Ankpa (28.0%) and Ajaokuta (45.0%) see the poor quality of road transportation as the prevailing impedance to mobility. The majority of the respondents in Dekinna (30.8%), Mopa-Amuro (31.4%) and Bassa-Oguma (52.0%) stressed that poor road conditions significantly inhibit urban mobility. Also, a high cost of transportation was observed in Adavi (34.7%) and Kabba-Bunu (45.0) as a significant impediment to urban mobility. Urban dwellers in Adavi, Okenne, Kabba-Bunu, Lokoja and Bassa-Oguma identified accident and robbery, among others, as factors militating against urban mobility.

Across the urban centres, traffic congestion was the most striking concern affecting urban mobility in Okenne and Lokoja. The two urban centres are significant traffic collectors from the country's Southern, Eastern and Northern parts. In addition to the above, these urban centres were surrounded by geographic features such as hills, rocks and rivers, which impede road construction and free traffic flow within the urban centre. Other causes of traffic congestion in Okenne and Lokoja include poor roundabout management, on-street parking, poor road condition, vehicle breakdown, incessant picking and alighting of passengers on the road, and poor drainage system, among others. Corroborating the above, especially in Lokoja, Adetunji (2017) Atomode et al. (2019) identified vehicle manoeuvrings along the road intersections, parking problems, broken down vehicles, impatience on the part of motorists on the right of way, particularly during peak hour, accidents, and roadside hawking/trading among others as the significant causes of traffic congestion.

Poor quality of road transport service has been discovered to be a significant challenge confronting urban mobility in Ankpa and Ajaokuta. This is because most must wait more than 20 minutes before getting a vehicle for their trips. This is way beyond the recommended globally acceptable waiting time for cars. Alphonsus (2010) believes that the quality of road transport service can be determined by the waiting time of passengers before getting a car. He remarked that waiting time, i.e., the time a passenger has to wait before getting on a vehicle, is an essential attribute of public transport service used in predicting the quality of the transport system. Alphonsus (2010) stated that the average passenger waiting time (the time passengers are expected to wait for the arrival of buses at bus stops) that is globally acceptable

ranges from 5-10 minutes for high-quality bus services to and11-20 minutes for moderate-quality services. When the passenger's waiting time exceeds 20 minutes, the service rendered by the transport operators is considered to be poor. Poor quality of road transport services can also be attributed to inadequate public transportation, as pronounced in the selected urban centres for the study. These have resulted in the proliferation of commercial motorcycle transport businesses across all the urban centres for the study.

The poor road condition was identified as the central urban mobility problem in Dekinna, Mopa-Amuro and Bassa-Oguma. This has made it difficult for the urban centres (i.e., in most cases, delayed journey time) as deep potholes and defective drainage systems characterise most roads. This situation explains the high cost of transportation in the study area. Poor road condition across the selected urban centres is a common occurrence that has increasingly impeded smooth vehicular movement in Kogi state. In consonance with the above, Olaleye (2010) claimed that more than half of African roads (Nigeria inclusive) are motorable for less than half of the year. Undoubtedly, the poor state of many African highways and transport networks becomes a limiting factor to the ability of many African countries to compete favourably and effectively in the global competitive markets.

In addition to the above, Ogwude (2016) maintained that city roads in Nigeria share similar problems with other African city roads, with a significant percentage of one poorly maintained lane prone to flooding due to poor drainage. The implication is that capacity is limited in most cities, and service lanes are absent, putting more strain on existing capacity. Of course, inadequate capacity and poor road conditions reduce vehicle speeds, engender traffic congestion, reduce productivity for all vehicle types, increase the cost of vehicle maintenance and cause accidents. Based on the field survey, the deep and very sharp potholes in the study area have been the primary cause of road accidents in Kogi State. This is further aggravated by the driver's carefree attitude of impatience, wrong overtaking and overspeeding.

Table 2: Urban Dwellers Perception on Mobility Challenges in the Selected Urban Centres

Urban Centre's Mobility Challenges	Adavi	Okenne	Ankpa	Dekinna	Mopa-Amuro	Kabba-Bunu	Lokoja	Ajaokuta	Bassa-Oguma
Traffic congestion	22 (14.7%)	59 (28.8%)	15 (7.5%)	- -	- -	- -	55 (36.7%)	- -	- -
Poor quality of road transportation	10 (6.7%)	31 (15.1%)	56 (28.0%)	23 (11.8%)	3 (8.6%)	10 (12.5)	22 (14.7%)	45 (45.0%)	5 (5.0%)
Poor road condition	15 (10.0%)	15 (7.3%)	21 (10.5%)	60 (30.8%)	11 (31.4%)	5 (6.3%)	15 (10.0%)	5 (5.0%)	52 (52.0%)
Delay in journey time	10 (6.7%)	25 (12.2%)	20 (10.0%)	20 (10.3%)	6 (17.1%)	- -	20 (13.3%)	10 (10.0%)	11 (11.0%)
Inadequate public transportation	36 (24.0%)	34 (16.6%)	44 (22.0%)	25 (12.3%)	6 (17.1)	27 (33.8%)	23 (15.3%)	20 (20.0%)	18 (18.0%)
High cost of transportation	52 (34.7%)	40 (19.5%)	44 (22.0%)	53 (27.2%)	9 (25.7%)	36 (45.0%)	10 (6.7%)	20 (20.0%)	12 (12.0%)

Others	5 (3.3%)	2 (1.0%)	- -	14 (7.2%)	- -	2 (2.5%)	5 (3.3%)	- -	2 (2.0%)
Total	150 (100.0%)	205 (100.0%)	200 (100.0%)	195 (100.0%)	35 (100.0%)	80 (100.0%)	150 (100.0%)	100 (100.0 %)	100 (100.0%)

Source: Author's Field Work, 2019

6.0 *Conclusion and Recommendations*

This study assessed urban mobility challenges in selected urban centres in Kogi State, Nigeria, and findings revealed that traffic congestion is the dominant impediment to urban mobility in Okenne and Lokoja; poor quality of road transportation hampered mobility in Ankpa and Ajaokuta; poor road conditions dotted Dekinna, Mopa-Amuro and Bassa-Oguma urban space; and high cost of transportation hindered efficient and effective mobility in Adavi and Kabba-Bunu. Remarkably, urban centres, as a hub for diverse economic activities, will only experience diverse challenges if they are fully supported by modern transportation systems that are safe, secure, comfortable, and affordable for all urban dwellers. Therefore, the following are recommended to ensure efficient urban mobility in Kogi State.

i. There is a need to create an alternative access route by constructing more motorable roads within the urban centres to facilitate easy movement of people, goods and services, especially in Okenne and Lokoja. This will reduce traffic congestion in the area, which can be achieved by adopting workable government-private partnerships in road infrastructure delivery.
ii. There is a need for public transport services that are affordable and comfortable for the people. This can be done by formulating a national fiscal policy that will encourage private organisations to partner with the government for effective transport services and reduce the cost of spare parts and new vehicles in the country.
iii. The government should develop a standard road capacity framework for road construction, rehabilitation and maintenance across the urban centres in Kogi State. This will solve the problem of poor road conditions that have hampered efficient and effective mobility in the country.
iv. The government needs to institute and empower an agency to regulate the cost of transportation or fare charges by transport operators. This will guide against incessant arbitrary charges or constant hikes in transport costs by transport operators in Kogi State and Nigeria.

References

Adetunji, M. A. (2017). Assessment of the quality of urban transport services in Nigeria, Academic *Journal of Interdisciplinary Studies* 2 (1):49-58.

Alphonsus, N. A. (2010). An Assessment of the Quality of Interurban Bus Services in the City of Enugu, Enugu State, Nigeria. *Theoretical and Empirical Researches in Urban Management* 6(15):75-91

Arup Climate Group (n.d). *Urban Mobility in the Smart City Age. Smart cities cornerstone series* retrieved from www. Arup.com/final_scheider_Smart-Mobility on 26th July 2020

Asenime C. O. (2008). *A Study of Water Transport in Metropolitan Lagos*. An unpublished Ph.D. Thesis. University of Lagos, Nigeria.

Asenime, C. (2013). Intermodality, Mobility and Traffic Flow in Metropolitan Lagos. *American Journal of Social Issues and Humanities* 3(6): 303-311

Atomode, T. A., Odusolu, E. S. and Isah, I. O. (2019). Spatio-Temporal Pattern of Traffic Congestion in Lokoja, Nigeria: The Transport Stakeholders' Perspectives in *"Perspectives on Research and Sustainable Development in the 21st Century, Nigeria*. A Book Published by Faculty of Arts and Social Sciences, Federal University Of Lokoja, Nigeria

Badejo, B. A. (2014). *Transporting the future today: portrait of Nigeria.* Inaugural lecture, Olabisi Onabanjo University, Ago-Iwoye, Ogun State.

Basorun, J. O. (2005). Human posed barriers to urban commute: Findings and reflections on Akure, Nigeria. *International Journal of Environmental Issues*, 3(1) 88 - 100

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* 1(2): 82-87 (1):33-50.

Bimal, D. (2014). *Transport Geography*. Venus Book Publisher and Distributors, New Delhi.

Boareto, R. (2003). *A brief analysis of informal transportation in Brazil and experiences in regulation*. Published by Ministry of Cities, Brazil.

European Commission (2007). *Green Paper: Towards a new culture for urban mobility*. Publication of the European Commission, COM (2007) 551 final, Brussels

Fasina, S. O., Akanmu, A.A., Salisu, U. O. and Okunubi, S. A. (2020). Intra-City Mobility and Characterization in a Fast-growing City of Lagos, Nigeria. *Logistics & Sustainable Transport Journal* 11 (2) 12-22

Gbadamosi, K. T. and Olorunfemi, S. O. (2016). Rural Road Infrastructural Challenges: An Impediment to Health Care Service Delivery in Kabba-Bunu Local Government Area of Kogi State, Nigeria. *Academic Journal of Interdisciplinary Studies* 5(2):35.44

Hyodo, T., Montalbo, C. M., Fujiwara, A. & Soehodho, S. (2015). Urban travel behaviour characteristics of 13 cities based on household interview survey data. *Journal of the Eastern Asia Society for Transportation Studies,* 6 (2015): 23–38.

Kenworthy, J. R., (2008). *Energy use and CO2 Production in the urban passenger transport systems of 84 international cities: findings and policy implications*. In: Droege, P. (Ed.), Urban Energy Transitions. Elsevier Science

Montana, J. E. and Rafael, G. E. (2016). *Comments and Suggestions for Mobility and Road Safety Improvement in Caceres*, Spain.

Ogwude, I. C. (2016). Managing Transportation Infrastructure In Nigerian Cities. *FUTA Journal of Management and Technology Maiden Edition, 17-28*

Ohakwe, A. O. & Ezirim, O. N. (2006). *Project planning and evaluation: The planner's perspective*. Port Harcourt, Nigeria: Alpha Armour Investment Ltd

Okoko, E. (2009). Global Cities and the Quandary of Mobility: The P3 Paradigm as Panacea in Lagos Megacity. *Journal of the Nigeria Institute of Town Planners* XXII (1): pp. 95–104.

Okoko, E.E. (2018). *Spatial Interaction: The Quintessence of Urban Mobility*. An Inaugural Lecture Series 98 of The Federal University of Technology, Akure, Nigeria, delivered on Tuesday, 8th May, 2018.

Olaleye, F. A. (2010). *Developing the African Economy: The Challenge of Infrastructural*. Paper Presented at International Conference of National Development and Millennium Goals toward Poverty Alleviation, Gimpa, Achimota, Aera Ghana

Olorunfemi (2020). *Road Infrastructure and Urban Mobility in Selected Urban Centres in Kogi State, Nigeria*. Unpublished PhD Seminar of Department of Transport Management, Federal University of Technology Akure, Nigeria.

Oni S.I (1992). *A Study of Car parking provisions in metropolitan Lagos.* An unpublished Ph.D. Thesis, University of Lagos, Nigeria.

Osuji, S .C and Onyenechere, E.C. (2013). The Challenges of Mobility within Owerri City, Nigeria. *Canadian Social Science* 9 (3): 68-73

Rietveid, P. (2001). "*Biking and Walking: The Position of Non-Motorized Transport Modes in Transport System and Traffic Control.* Pergamon, United Kingdom.

Rodrigue J. P. (2017). *The Geography of Transport Systems: The Spatial organisation of transportation and mobility*. Retrieved from http://people.hofstra.edu/geotrans/eng/ch6en/conc6en/ch6c3en.html.

Salisu, U.O. (2019). The state of transport administrative structure is in Lagos, Ogun, and Oyo States, Nigeria. *Journal of Spatial and Organizational Dynamics* 7 (1):68–85.

Solanke, M.O. (2013). Challenges of urban transportation in Nigeria. International Journal of Development and Sustainability2 (2) (2013):891-901.

Sudhakara, B. R. and Balachandra. P. (2012). Urban mobility: A comparative analysis of megacities of India. *Transport Policy* 21 (2012) 152–164.

UN-Habitat (2013). *Tool for Rapid Assessment of Urban Mobility–Pilot Test in Nashik City.* Prepared by the Institute of Transportation and Development Policy and Clean Air Asia for UN-Habitat Nairobi, Kenya.

World Bank, (2002). *Cities on the Move - A World Bank Urban Transport Strategy Review.* Private Sector Development and Infrastructure Department, Washington, D.C, 206

Yannis, T and Constantinos, A. (2013). Factors affecting modal choice in urban mobility. *Eur. Transp. Res. Rev.* 2013 (5): 27–39