

## Traffic Congestion in Major Cities of Nigeria

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### ABSTRACT

This paper investigates traffic congestion which has become a common sight in most urban cities of Nigeria. A survey was conducted during the Annual National Conference of the Nigerian Society of Engineers (NSE) which held between 5<sup>th</sup> and 9<sup>th</sup> December 2011 at the Calabar Tinapa Business and Leisure Resort. 300 questionnaires were distributed among participants comprising experts in transportation planning and design as well as engineers of other disciplines, students, wives of engineers and other invited guests who constitute commuters, car owners/drivers, etc. 196 returns were made and these were analysed to ascertain the broad perspectives concerning the causes of traffic congestion in most urban cities in Nigeria. The results show that poor driving habits, poor road network, inadequate road capacity, and lack of parking facilities constitute the greatest causes of traffic congestion in Nigeria. Also, Lagos, Port Harcourt and Abuja were identified as cities most affected by traffic congestion.

**Keywords:** *Cities, Congestion, Traffic, Traffic congestion, Urban.*

### 1. INTRODUCTION

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

Many urban cities in Nigeria are bedevilled with traffic congestion which tends to defy various remedial measures adopted by different governments over the years. Journey times from one point to another within a town have remained unreliable and residents have continued to face disturbing inconveniences in transportation. These are accompanied by noise and air pollution and the high costs associated with burning of fuels from stationary vehicles. The contributions of road transportation to environmental degradation in urban cities of Nigeria have been highlighted by Onokala (2008). The problem is no longer limited to traditional cities such as Lagos, Ibadan, Benin-City, Port Harcourt, Abuja, Kano, and Kaduna (Ogunsanya 2002; Ogunbodede nd). Virtually every state capital city in Nigeria today faces the problem of traffic congestion (Moses 2011). For example, Calabar city which was not previously associated with traffic congestion is now facing considerable traffic congestion on many of its urban roads, particularly when the schools are in session.

Although many researchers have conducted studies on traffic congestion and delays in Nigeria, most of these studies concentrate on specific cities such as Lagos (eg. Aworemi *et al* 2009; Bashiru & Waziri 2008), Ilorin (eg. Aderamo & Atomode 2011), Akure (eg. Ogunbodede n.d.), etc. All these fall under only the south-western part of Nigeria with different cultural practices and behaviours compared with other geo-political regions of the country. Also, a review of previous research shows that the views of expert transportation engineers have not been considered. Hence, the annual conference of the Nigerian Society of Engineers (NSE) with the theme "*Effective Transportation System in Nigeria: The Way Forward*", which took place between 5<sup>th</sup> and 9<sup>th</sup> of December 2011 at the Calabar Tinapa Business and Leisure Resort, provided an opportunity for this study. The survey covered a variety of respondents ranging from commuters, drivers to experts on transportation planning and engineering from all parts of Nigeria and beyond. This is intended to provide a wider perspective to the problem of traffic congestion in Nigeria.

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

- "Congestion is a situation in which demand for road space exceeds supply.
- Congestion is the impedance vehicles impose on each other, due to the speed-flow relationship, in conditions where the use of a transport system approaches capacity.

- Congestion is essentially a relative phenomenon that is linked to the difference between the roadway system performance that users expect and how the system actually performs.”

Just as the definitions of traffic congestion are broad so are the causes. There are many causes of traffic congestion and these differ from place to place. The study attempts to investigate the main causes of traffic congestion associated with Nigerian urban cities with a view to suggesting solutions to help governments and policy makers towards better cost and effective management of this problem. Traffic congestion is sometimes the result of urban development, housing, employment and cultural policies which cause people to live and work relative to one another in close proximity (ECMT, 2007). Ogunsanya (2002) argues that traffic congestion is a major transportation problem of Nigerian cities. At international level, it has been argued that “*dynamic, affordable, liveable and attractive urban regions will never be free of congestion*” (ECMT 2007:7). If this is true then efforts will be geared towards cost effective management of the problem. The first step towards such effective management is the identification of the problem causes.

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.

## 2. OBJECTIVES

The objectives of this study include:

- To review the literature on existing studies concerning road traffic congestion in major urban cities of Nigeria;
- To investigate on a nation-wide basis, the causes of traffic congestion in major cities of Nigeria; and
- To investigate and proffer possible remedies to the traffic congestion problems in Nigerian urban cities.

## 3. LITERATURE REVIEW

A number of studies have been conducted in Nigeria and elsewhere concerning traffic congestion and its causes. Ogunbodede (n.d.) studied traffic congestion in Akure Nigeria using GIS approach. It was argued that traffic congestion is as a result of the increasing growth in motor vehicles without a corresponding improvement in transport facilities such as road network, traffic management techniques. The study also highlighted illegal roadside parking and lack of geospatial information necessary to tackle the spatial problem as other causes of traffic congestion. The study further suggested the use of a dynamic Traffic Information System (TIS) structure to monitor congestions in Akure city. This will also alert or inform road users about congested routes through linkage with Federal and State

Radios. It cautioned however that this should not be used in isolation but to complement traditional methods of traffic management such as construction of new routes, flyovers, one-way, odd and even numbers, etc which have earlier failed on their own to solve congestion problems in cities such as Lagos, Port Harcourt, Benin-City, etc. The limitation in the TIS approach lies in the possibility of some road users not tuning to radios, or the radio stations not devoting the entire airtime to traffic information. However, with the level of technology available today, the use of Variable Messaging Signs (VMS) located at strategic points on the road may provide a suitable alternative to the TIS.

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

Similarly, Aworemi *et al* (2009) studied traffic congestion in Lagos Metropolis. In agreement with Bashiru and Waziri (2008), the study noted the following major causes of traffic congestion. These include: poor road condition, inadequate road infrastructure, accident, inadequate traffic planning, drivers’ behaviour and lack of integrated transport system.

The problem of traffic congestion at road intersections in Ilorin Nigeria has been examined by Aderamo and Atomode (2011). Road intersections form a major component of urban roads and are generally prone to traffic congestion. The study found that traffic wardens and parking problems are the greatest causes of traffic congestion/delays at road intersections in Ilorin. Their study highlights the fundamental theory of traffic flow to underscore the importance of traffic flow characteristics such as flow, density and velocity to the planning, design and operation of urban roads. This is in line with Salter and Hounsell (1996).

In a study by Agbonika (2011) in Abuja Nigeria it was found that only 18.57% of the sampled commuting population lived within the city centre. This indicates that the location of major government offices with respect to the spread of residential areas, where this is not properly considered in town planning and development of master plans for major urban cities, can cause serious congestion problem due to mass movement within the same period as in the case of civil servants moving to and from work around the same period of time. This is confirmed by the study as the worst congestions in Abuja occur in the morning (8.00 am) and evening (6.00pm) respectively.

Momoh (2011) argues that poor planning of transportation system in Nigeria has led to over dependence in motor vehicles resulting

in too many vehicles with its accompanied problems including traffic congestion. This problem of poor planning/design and management has been supported by many papers presented during the NSE conference (eg. Igwe et al 2011; Haruna 2011; etc).

The above previous studies have only concentrated on just a few cities in Nigeria and do not reflect traffic congestion problems in the country. Hence, the AGM of the NSE which brings together road users and residents of virtually all major cities in Nigeria provides a great opportunity to study and understand the problems of traffic congestion across different cities of Nigeria to provide a wider perspective to the problem.

#### 4. METHODOLOGY

300 questionnaires were distributed among participants at the Annual General Meeting (AGM) and National Conference of the Nigerian Society of Engineers (NSE) comprising experts in transportation planning and design as well as engineers of other discipline, students, wives of engineers and other invited guests who constitute commuters, car owners/drivers, etc. Total 196 or 65.33% questionnaires were returned. These were analysed using simple percentages and basic statistical tools to understand the trend of responses concerning traffic congestion problems in major cities of Nigeria. The results are presented in tables and charts.

#### 5. CHARACTERISTICS OF RESPONDENTS

In order to determine the characteristics of the respondents, respondents were asked to classify themselves according to the following: Sector of the economy, employment status, profession and registration with professional bodies. The results are presented in tables 1 to 4. Table 1 below shows that 62.8% of the respondents are from the public sector of the economy, while 30.1% are from the private sector. & 7.1% constitute mainly students of tertiary institutions.

**Table 1: Background of Respondents**

Sector	No.	Percentage (%)
Public	123	62.8
Private	59	30.1
Student	14	7.1

Also Table 2 shows that 73.5% are employed, while 17.9% are self-employed. 7.7% are students. Furthermore, the professional affiliations of the respondents are presented in Table 3 below. This shows that Civil Engineers constitute 53.6%, Mechanical Engineers 18.4%, Electrical Engineers 16.3%, Agricultural and Chemical Engineers 3.6% each, while Computer Engineers constitute 1.5%. Other professionals including engineers and non-engineers constitute 3.1% of the respondents.

**Table 2: Employment Status of Respondents**

Status	No.	Percentage (%)
Employed	144	73.5
Self-employed	35	17.9
Student	15	7.7
Other	2	1.0

**Table 3: Profession of Respondents**

Profession	No.	Percentage (%)
Civil Engineering	105	53.6
Mechanical Engineering	36	18.4
Electrical Engineering	32	16.3
Agricultural Engineering	7	3.6
Chemical Engineering	7	3.6
Computer Engineering	3	1.5
Other	6	3.1

Table 4 below indicates that 26.0% of the respondents are registered members of the Nigerian Society of Engineers (NSE), while 54.6% are registered with both NSE and the Council for the Regulation of Engineering in Nigeria (COREN).

**Table 4: Registration status of Respondents**

Status	No.	Percentage (%)
NSE	51	26.0
NSE & COREN	107	54.6
Student	17	8.7
Other	21	10.7

#### 6. RESULTS AND DISCUSSIONS

This section presents results and analyses of traffic congestion in major urban cities of Nigeria. A total of 171 or 87.2% of the respondents agree that they experience traffic congestions in their cities of residence, while 25 or 12.8% disagree that there are traffic congestions in their cities of residence. This appears to agree with Moses (2011) who argues that traffic congestion is a problem in most cities of Nigeria. Also concerning the state of roads in the different cities, 47.7% of the respondents agree that the state of roads in their cities is at least good, while 52.3% believe that the state of roads is poor. The nature of roads has a tendency to affect traffic congestion. For instance, roads with potholes are likely to impede the smooth flow of traffic and therefore will increase congestion of traffic around the position of potholes.

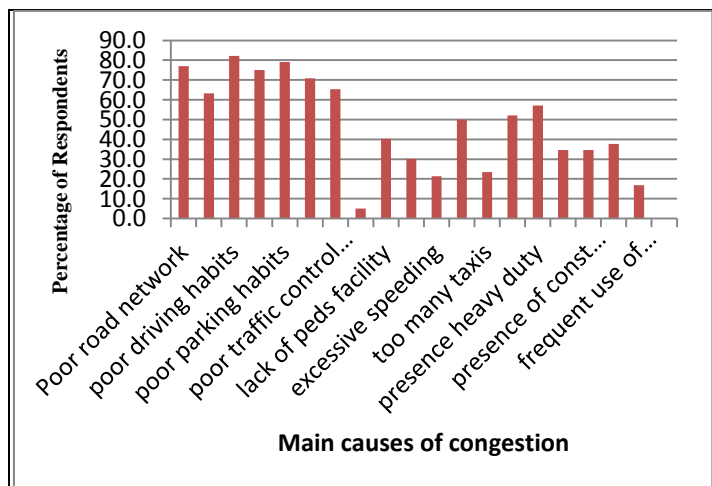
##### 6.1 Causes of Traffic Congestion

This study has shown that poor driving habit is the most significant cause of traffic congestion in Nigerian urban cities. From Table 5 and Figure 1, it can be seen that other major causes

of traffic congestion include: poor parking habits, poor road network, inadequate road capacity, lack of parking facilities, poor traffic control/management, poor drainage, presence of heavy vehicles, poorly designed junctions/roundabouts and lack of efficient mass transport system. These tend to agree with earlier findings from a number of studies (eg. Bashiru and Waziri 2008; Aworemi et al 2009; Aderamo and Atomode 2011, etc).

**Table 5: Causes of Traffic Congestion**

Rank	Causes of congestion	No	Percentage
1	poor driving habits	161	82.1
2	poor parking habits	155	79.1
3	Poor road network	151	77.0
4	inadequate road capacity	147	75.0
5	lack of parking facilities	139	70.9
6	poor traffic control management	128	65.3
7	Poor drainage	124	63.3
8	presence of heavy vehicles	112	57.1
9	poorly designed junction/roundabout	102	52.0
10	lack of efficient mass transit	98	50.0
11	lack of pedestrian facility	79	40.3
12	malfunctioning vehicles	74	37.8
13	poor road pavement	68	34.7
14	presence of construction activities	68	34.7
15	lack of road furniture	59	30.1
16	too many taxis	46	23.5
17	excessive speeding	42	21.4
18	frequent use of sirens	33	16.8
19	poor weather	10	5.1
20	others	0	0.0



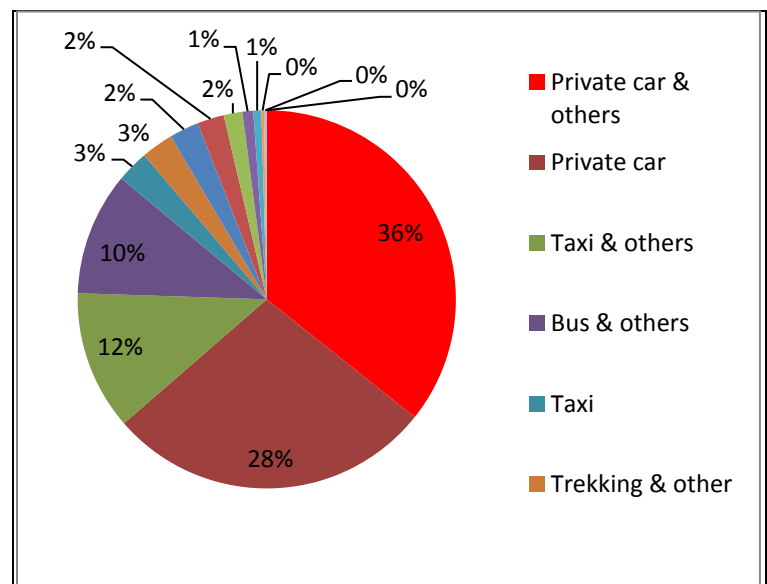
**Figure 1: Causes of Traffic Congestion**

**6.2 Modes of Urban Transportation**

In order to understand the problems of congestion and proffer solutions in line with global practice, the authors investigated different means of urban transportation available to respondents. The results are presented in Table 6 and Figure 2. These indicate that urban transportation in Nigeria is mostly done using private cars and taxis. These have a tendency to increase congestion due to too many vehicles on the road. For instance 20 passengers in a single mass transit bus will translate to 20 vehicles on the road at the same period of time, if all the passengers chose to use private cars instead of bus and about 6 to 20 vehicles, if the passengers chose taxis. Hence, the means available for urban transportation has a tendency to affect traffic congestion.

**Table 6: Modes of Transportation**

Rank	Means of transportation	No.	Percentage
1	Private car & others	156	35.7
2	Private car	122	27.9
3	Taxi & others	52	11.9
4	Bus & others	46	10.5
5	Taxi	12	2.7
6	Trekking & other	12	2.7
7	Motorcycle & others	11	2.5
8	Tricycle	10	2.3
9	Bus	7	1.6
10	Bicycle & others	4	0.9
11	Treking	3	0.7
12	Tricycle	1	0.2
13	Motorcycle	1	0.2
14	Bicycle	0	0.0

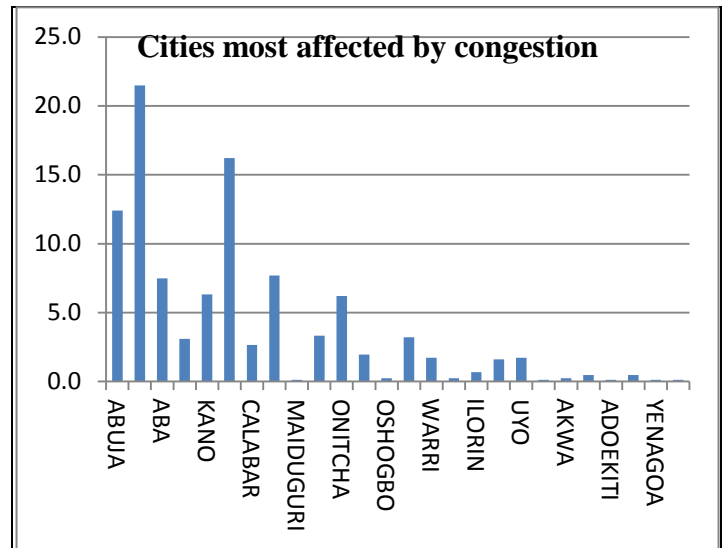


**Figure 2: Different Modes of Transportation in Nigerian Urban Cities**

Also, given the background that the use of commercial motorcycles for urban transportation has been banned in most cities of Nigeria (eg. Abuja, Calabar, etc), the authors sought to know the effect of this action on the level of traffic congestion. The results from Table 7 and Figure 3 indicate mixed reactions: 39.3% of the respondents believe that there is no significant effect on traffic congestion, while 25.5% believe that the withdrawal of motorcycles have caused more congestion. This can be a subject for further investigation.

**Table 7: Effect of withdrawal of Motorcycles**

RANK	Effect of withdrawal of Motorcycles	No.	Percentage
1	No significant effect	77	39.3
2	More congestion	50	25.5
3	Not applicable	41	13.0
4	Less congestion	25	12.8



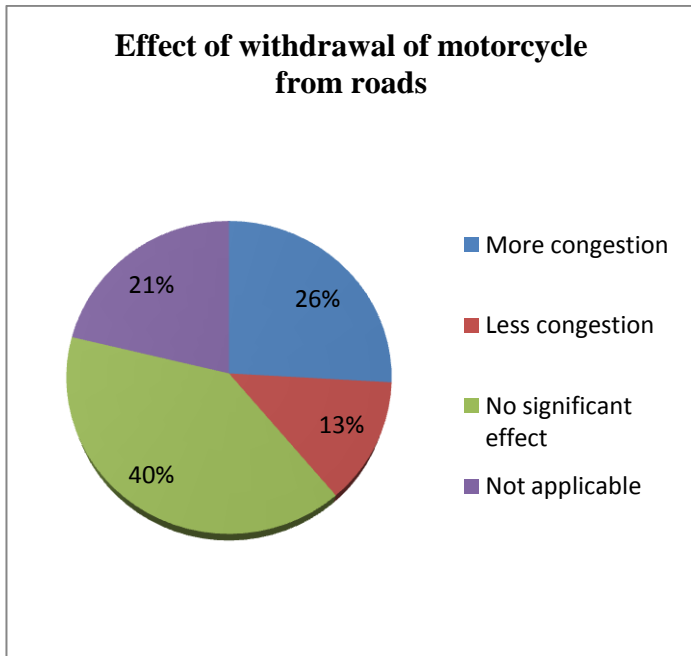
**Figure 4: Cities most affected by Congestion**

**6.4 Remedies to Traffic Congestion**

The findings from this study on the possible remedies to traffic congestion are presented in table 8 and Figure 5 below. These show that good road network/improvement, encouragement of public mass transport, proper traffic planning/management, regular road maintenance, construction of interchanges and regular education of road users are among the major remedies suggested from this study.

**Table 8: Remedies to Congestion**

S/N.	Remedies to congestion	No.	Percentage
1	Parking	34	17.3
2	pedestrian facilities	27	13.8
3	Interchanges	72	36.7
4	traffic management/ Planning	82	41.8
5	Congestion pricing	4	2.0
6	Public mass transport	87	44.4
7	Education	60	30.6
8	Maintenance	73	37.2
9	Re-routing of heavy-duty vehicles	31	15.8
10	Enforcement	23	11.7
11	Good road network/improvement	114	58.2
12	Road furniture	27	13.8



**Figure 3: Effect of withdrawal of Motorcycle from Roads**

**6.3 Cities most affected by Congestion**

Investigation was also conducted to ascertain the urban cities that are most affected by congestion by asking respondents to state 10 cities in Nigeria considered to be most affected by traffic congestion. The results are presented in Figure 4 below. This shows that Lagos city suffers the most traffic congestion in Nigeria. This is followed in order by Port Harcourt, Abuja, Ibadan, Aba, Kano and Onitsha. A total of 26 cities were considered by the respondents as shown in Figure 4.

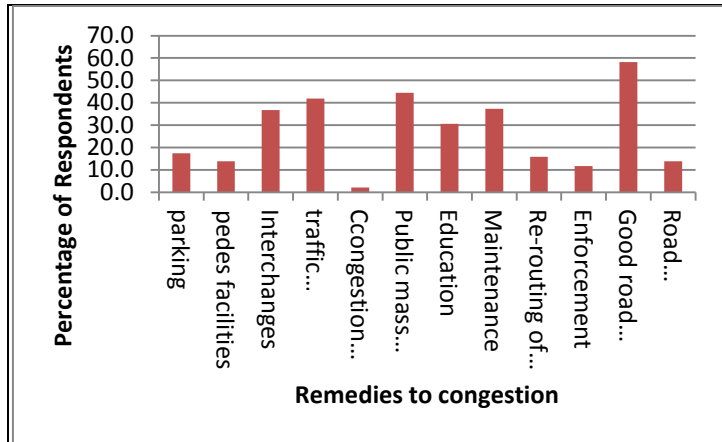


Figure 5: Remedies to Traffic Congestion

## 7. CONCLUSION AND RECOMMENDATIONS

This study has brought into focus the issue of traffic congestion in major urban cities of Nigeria. The main causes of congestion have been considered indicating that poor driving habits, poor road network, inadequate road capacity, and lack of parking facilities are the greatest causes of traffic congestion in Nigeria. The study has also shown that Lagos, Port Harcourt and Abuja cities are most affected by traffic congestion, among other major cities in Nigeria.

The study has also highlighted some remedies to improve traffic congestion in Nigeria. Good road network, encouragement of mass transport system, proper traffic planning/management, regular road maintenance, construction of interchanges and regular education of road users are among the recommendations to reduce traffic congestions. The various state governments controlling most of these cities affected by congestion should encourage the use of reliable mass transit buses to reduce the number of vehicles on their urban roads. Proper and consistent bus stops which are not too far apart should be sited across each city, including provisions for enforcing compliance by bus drivers. The Federal and State governments should initiate plans for the introduction of other forms of urban transportation such as Metros and Trains which support mass movement of people as done in major urban cities globally.

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