PHYSICAL PLANNING PERSPECTIVE OF THE CAUSES OF TRAFFIC CONGESTION IN THE CENTRAL AREA OF OSOGBO

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Abstract

This study analyzes the physical planning perspective of the causes of traffic congestion in the central area of Osogbo with a view to investigating the socio-economic lifestyle of commuters and Identifying the Causes of Traffic Congestion within the study area.The study annexed both primary and secondary sources for data collection. The study adopts 3% sampling for the study out of the total traffic count of 19745 respondents that ply the road; this therefore amounted to 364 respondents from the 7 selected junctions in the area. The results of the finding shows that the causes of traffic congestion can be categorise under three factors namely human, physical and landuse factors. It also shows that the socioeconomic status of respondents influences the condition of traffic congestion. The study concludes and makes recommendations such as need for public enlightenment / regular education of road users in the study area on the need to use traffic control device (TCDs), need to Decongest of activities at the central area of Osogbo so as to reduce the number of travel to the area, Construction of proper and consistent bus terminal which are not too far apart within the city, Enforcement the use of alternate route so as to minimize the number of traffic within the city centre during the peak hour of the day. It is recommended to provide parking plaza strategically within the area to curb the problem of on-street parking in the area.

Keywords: Central area, Congestion, physical Planning, Perspective and Traffic

1.0 INTRODUCTION

Transportation is an activity of life processes that seeks to offer entry to diverse activities that fulfill mobility needs of human kind (Arasan 2013). Transportation performs a prime role in city improvement and on city growth, being a prime urban land use element; it promotes the improvement of diverse activities that foster economic development, offers necessary channels of communication and interaction. The number one functions of transportation are to facilitate the movement of humans and items and to offer access to land use activities positioned in the service area (Levinson and Lomax, 2015).The provision of transportation services for the populace is becoming increasingly hard because of the dynamic enlargement of city areas (Ko´zlak and Wach, 2018).Currently, traffic congestion is considered an in depth global problem, resulting from excessive population concentration,

expansion of infrastructure, motor vehicles, and growth of rideshare and delivery service activities (Afrin and Yodo, 2020). Physical planning also recognized by a lot of different names which includes spatial planning, town planning, urban and regional planning or urban planning deals with spatial arrangement of land uses in human settlements. The primary purpose of physical planning is to bring orderly and sustainable improvement of human settlements. This is attained by developing and enforcing a variety of spatial plans in city areas, typically called master or structural or land use plans. The master plans do imply the arrangements of various land uses which includes for example for residential, commercial, institutional, open areas, recreational and line infrastructures. The line infrastructure consists of transportation facilities in terms of various types of roads, railways, water supply,

energy and telecommunication systems, solid and waste management (Kiunsi, 2013).

The rapid urbanization and economic growth capacity in the urban regions bring about the need for large transport activities, and when these needs are met, traffic congestion happens at the same time (Agyapong and Ojo, 2018). Traffic Congestion is defined as the level of vehicle traffic that exceeds a road's capacity, leading to reduction in moving vehicle velocity or entire obstruction of free movement (Ko´zlak &Wach, 2018). According to Aderamo (2012) physical planning and transportation planning are closely connected together. This is because the manner land uses are organized will have an effect on trip generation, travel patterns and traffic volumes which in turn will have effect on the transportation facilities which are meant for accessibility to different part of the city. Traffic congestion has turn out to be a disturbing problem in lots of cities all over the world (Wang, et al, 2014). The aim of this research, therefore, is to analyze physical planning perspective of the causes of traffic congestion in the central area of osogbo, Nigeria with the view to providing suggestive recommendations to ensuring sustainable urban transport system in the study area.

2.0 LITERATURE APPRAISAL

Transportation and land use are inseparable; transportation is a particular kind of land use that connects diverse land uses to each other. Without a transportation route, one will not be capable to move from one land use to another. Transportation is not an end in itself; it is a way to an end due to the fact it is just the link from origin to destination. Transport infrastructure determines the number of people that can get to a location using a given amount of space and set modes of transport capable to delivering greater benefits more efficiently (Banister, 2002). Litman (2012) opined that planning decision affects land use development and in turn, land use Conditions have an effect on transport activity. The dominant land use in a place generates more traffic than other land uses (Eline ,Teije, 2015). Most transport routes, particularly roads have a tendency to attract human activities within their proximity because these activities have a comparative advantage when positioned within area of easy and cheap transport system (Okello, 2010).

Traffic congestion can be defined in two ways: the high automobile concentration moving at low flow speed, and the number of cars on the road is near or exceeds the maximum capacity of the road inflicting an imbalance between travel demand and transport system supply (Talukdar, 2013). According to Institute of Transport Engineers and Aderamo (2012) physical planning and transportation planning are closely connected together. This is because of the fact that the manner land uses are organized will have an effect on trip generation, travel patterns and traffic volumes which in turn will impact on the transportation facilities which are provided for accessibility to different parts of the urban areas. In line with the above submission, this study aims at analyzing physical planning perspective of the causes of traffic congestion in the central area of osogbo, Nigeria.

3.0 RESEARCH METHODOLOGY

3.1 *Research Location*

Osogbo is the capital of Osun State. Osogbo city seats the Headquarters of both Osogbo Local Government Area (located at Oke Baale Area of the city) and Olorunda Local Government Area (located at Igbonna Area of the city). It's around eighty eight kilometers through road northeast of Ibadan. It is likewise one

hundred kilometers by road south of Ilorin and one hundred fifteen kilometers northwest of Akure; Osogbo shares boundary with Ikirun, Ilesa, Ede, Egbedore and Iragbiji and is easily accessible from any part of the state due to its central nature. It is about forty eight km from Ife, 32 km from Ilesa, forty six km from Iwo, and forty eight km from Ikire and forty six km from Ila Orangun; the city had a population of approximately 156,694 people in 2006 in line with the census; the postal code of the area is 230. It has a coordinate of longitude 7°46N 4°34E and latitude of 7.767 ° N 4.567 ° E. The study area for the research work is the metropolitan of Akure with a focus on central area of the city as shown in Figures 1 and 2.

Figure 1 Map of Nigeria showing Osun State

Figure 2 Map of Osun State showing Osogbo

Source: Osun State Ministry of Lands and Physical Planning, 2022.

Figure 3 Map of Osun State showing Road Network
Source: Osun State Ministry of Lands and Physical Planning, 2022

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3.2 Research Database

The research methodology adopts the use of the quantitative and qualitative method of data .The primary data were gotten from drivers and commuters of the central area and personnel from related government agencies in charge of controlling traffic were also interviewed to gather information related to traffic conditions in the study area. The secondary source of information includes journals, seminar papers, dissertations, published and unpublished books, population statistics related to infrastructure development, AutoCAD and ArcGIS Software, and maps sourced from the library, internet, archives and institutions. The study sampling frame was taking from vehicle operators within the selected area, cars owner, commuters, traders as well as traffic warder that control the movement of vehicle at the selected traffic corridor. Twelve (12) traffic corridors were selected in the area due to the fact that they generate more traffic within the central area of Osogbo.

The Twelve (12) traffic corridors are Oja-Oba (King's Market), Isale Osun, Olu-Ode, Okefia, Old Garage, Ajegunle, Olaiya, Alekunwodo, Jaleyemi, Igbona, Ayetoro. This study adopts 3% sampling for the study out of the total traffic count of19745 respondents that ply the road; this therefore amounted to 364 respondents from the 7 selected junctions in the area. 3% research sample size was used as a result of common attribute and peculiarity of the selected junction in relation to the course of the research. The study was also justifying in line with the study of Joseph and Anderson, (2012) in which he made use of 300 questionnaires to achieve a desire a result on traffic congestion in major cities of Nigeria.

A multi-stage sampling procedure was employ for the research. The first stage adopts purposive sampling techniques to identified the central area of the city (core) from transition, peripheral, second stage involve the use of ballot sampling techniques to sampled 7 traffic corridor out of the 12 traffic corridor within the central area of the city. Stage three of the techniques adopt the use of convenient sampling techniques to sampled 3% each from the total respondents derived from traffic population for the study which amount to a total 364 sampled respondents. The accidental sampling techniques were used at the fourth stage due to the nature of the study any available commuter or vehicle operator available was sampled until the total number of sampling complete. And Purposive sampling techniques was used for the last stage on some of the agencies regulation traffic such as federal road safety commission (FRSC), National Union of Road Transport worker (NURTW), Traffic Warder among others.

The research instrument includes structured questionnaire, interview guide, Google Earth Pro, AutoCAD, and Geographic Information System (GIS). Frequency tables and figures were computed for each variable based on the set objectives with the use of univariate analysis.

4.0 Result and Discussion

4.1 Socio-Economic Characteristics of Respondents

The result of finding shows that majority of the respondents in the area where male with 69% and 31% of the respondents of the respondents were female. This eludes that majority of the respondents for the studies were either drivers or traders that constitute the major occupation of the respondents as presented in Figure 4.The finding also shows that more than half of the respondents in the area were married and are either Muslim nor Christian with less than 10% of the respondents also agree to be a traditional worshiper. This larger percentage of married gives reliable information about the course of study.

From the findings presented in Figure 1, it was also observed that one hundred and forty (140) out of the total 364 respondents engage in commercial activities in the selected traffic corridor of Osogbo, one hundred and eight (108) out of the total respondents were drivers, forty four (44) were professional, thirty six (36) were civil servant and thirty six (36) were also artisan, this alluded that most of the respondents selected for the study engages on mobility movement in the area either as a trader, drivers , civil servants or as an artisan. The age group of the respondents denotes that most of the respondents for the study were matured enough to provide related response to the course of study as larger percentages of 59.1% fall between the age group 31-51 years, 22% fall between the ages of over fifty one (51) years,12.1% fall between the age of 18-30 years. It was also discovered that most of respondents earns above Nigeria minimum wage as 37% as shown in figure 2 earns between 41,000-60,000 per month, which will aid increase in numbers of car owners among Osogbo residents.

Table 1: Socio-Economic Characteristics of the Respondents

Sex of the Respondents	Frequency	Percentages %
Male	251	69
Female	113	31
Total	364	100
Religion of the Respondents	**Frequency**	**Percentages %**
Islamic	186	51.1
Christianity	144	39.5
Traditional	34	9.3
Total	364	100.0
Marital Status of the Respondents	**Frequency**	**Percentages %**
Married	206	56.9
Single	94	25.2
Divorced	15	4.1
Widow	49	13.7
Total	364	100.0
Age of the Respondents	**Frequency**	**Percentages %**
under 18 years	25	6.9
18-30 years	44	12.1

31-51years	215	59.1
over 51 years	80	22.0
Total	364	100.0
Level of Education	**Frequency**	**Percentages %**
primary	45	12.4
secondary	81	22.3
tertiary	152	41.8
No formal education	44	12.1
post Graduate	42	11.5
Total	364	100.0

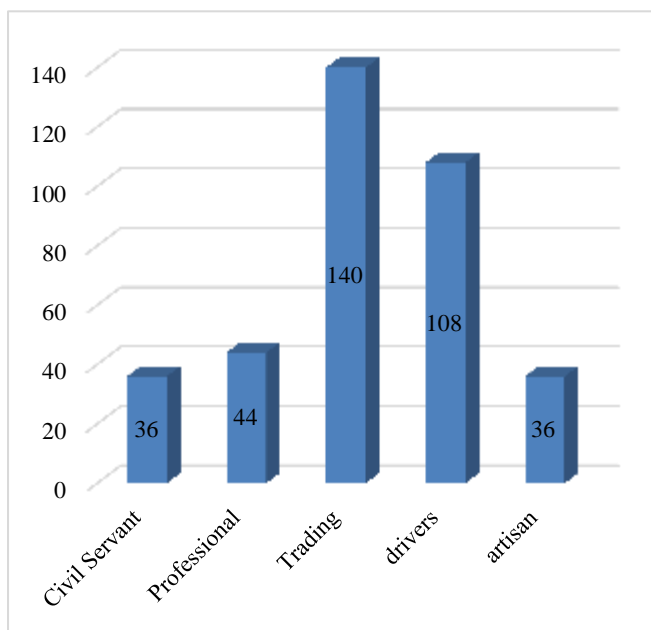**Source: Author's Field Survey, 2023**

Figure 1: Occupation of the Respondents
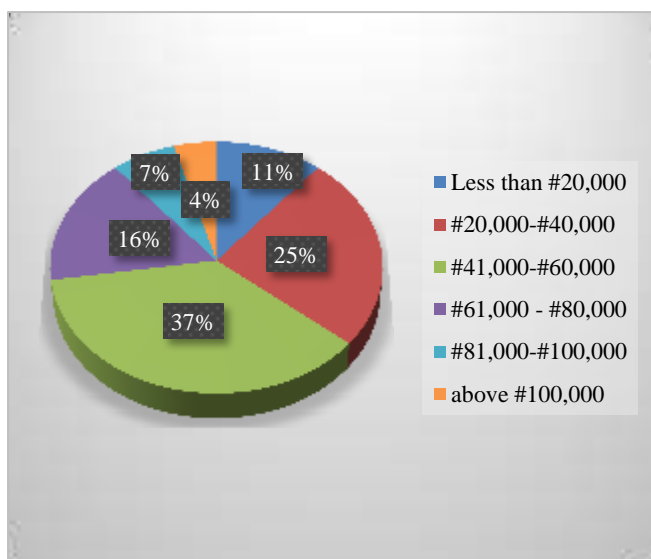Source: Author's Field Survey, 2023

Figure 2: Income Level of the Respondents

Source: Author's Field Survey, 2023

4.2 *Identifies the Causes of Traffic Congestion in the Central Area of Osogbo*

The researcher categories the causes of traffic congestion in the study area into three major factors which are human factor, physical factors and Landuse factor. The study also adopts a five Likert scale where 5 is ranked as a predominant cause, 4 as a relevant cause, 3 as somehow relevant causes, 2 as unimportant factor while 1 as very unimportant causes of congestion and. It was discovered as presented in table 2, it was observed that driver's attitude along the route especially that of commercial buses, driver usually park along the route, to pick and drop passengers which usually cause congestion and this was ranked 1st with a weighted mean of 4.04 which signifies that driver's attitude in the central area of Osogbo is major human factors that was responsible for congestion. Passengers attitude was also ranked 2nd with a weighted mean of 3.80 which show that driver attitude is due to passenger's attitude that want driver to pick them up in their respective location without plan to trek to a pick up station. Lack of pedestrian walk way was ranked 3rd with a weighted mean of 3.28 which shows that most of the road in the central area of Osogbo lack walkway which therefore causes congestion whenever there is pedestrian crossing or also reducing the carriage way of the route when walking in group. Absence of traffic warder at some selected junction ranked 4th with a lowest weighted mean of 2.44.

Table 2: human factors that causes Traffic congestion

Human factor	Weighted mean	Rank
Passenger's attitude	3.80	2nd
Lack of pedestrian work-way	3.28	3rd
Drivers attitude	4.04	1st
Absence of traffic warden at some Junction	2.44	4th

Source: Author's Field Survey, 2023

The findings on the physical factors that caused congestion as presented in Table 3 revealed that on-street trading, on-street parking and width of the road which are not enough to accommodate commuters are some of the physical factors that causes congestion in the central area of Osogbo as on street trading was ranked 1st with a weighted mean of 4.59 this show a high resolution of respondents in the study area that traffic congestion is associated with on-street trading as presented in Figure 3 while on-street parking was ranked 2nd with a weighted mean of 4.28 this alluded that congestion in the area was also due to on-street parking as driver in the area does not have a specific parking space to park their vehicles during shopping at the area therefore leading to reducing the carriage of the road with in long run leading to congestion in the study area as presented in the Figure 7 and 8 below. The width of the road was ranked 3rd with a mean of 4.05 which means that some of the selected junction in the area such as Oja-Oba still operate a single carriage way therefore causing traffic congestion along the route as presented in Figure 4. However, from other physical factors that causes congestion in the area where high volumes of traffic with a weighted mean of 3.78 and presence of many proximity junctions at the area with a mean value of 3.43.

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Table 3: Physical factors that causes traffic congestion

Physical factor	Weighted mean	Rank
Width of the road to accommodate traffic	4.05	3rd
High volume of Traffic	3.78	4th
Presence of many junction in the area	3.43	5th
On Street trading	4.59	1st
On street-parking	4.28	2nd

Source: Author's Field Survey, 2023

Figure 3: On-street trading along the route
Source: Author's Field Survey Field Survey

Figure 4: Congestion due to width of the road and driver's attitude
Source: Author's Field Survey

Figure 5: Congestion at a Cross Junction

Source: Author's Field Survey

From the findings presented on Table 4 on the land-use factor that causes congestion in the study area it was gathered from the findings that presence of commercial activities along the route is a major causes of congestion in the study area as this was ranked first during the study with a weighted mean score of 4.18. The presence of commercial activities in this area without provision for parking facilities therefore creating the problem of traffic congestion in the area as shown in Figure 7. The findings also show that presence of recreation activities such as Hotel, parks etc in the area without adequate provision for parking facilities usually causes congestion in the area as presented in Figure 7.

Table 4: Land-use factor that causes Traffic congestion

Land use factor	Weighed mean	Rank
Presence of commercial activities at all the core Junction	4.18	1st
Presence of motor park in the area	3.33	3rd
The road is the main access in the local government	3.31	4th
Presence of recreational facilities along the road	3.60	2nd

Source: Author's Field Survey, 2023

Figure 7: Shopping Plaza along the route without parking facilities
Source: Author's Field Survey, 2023

5.0 Conclusion and Policy Recommendation

Traffic congestion is a serious and a growing problem in the central area of Osogbo and has led to a number of socio-economic and environmental impacts. The nature and dynamics of traffic congestion is more or less similar as in many other cities of the country. In central area of Osogbo congestion is contributed by a number of factors including population increase, expansion of city boundaries, economic growth, increase of number of cars, poor road infrastructure, city physical structure, lack of updated master plan and poor development control, driver's attitude, passenger's attitude and on-street parking. Road rehabilitation, construction of overhead bridge and uses of state enforcement at some market are the main strategies applied by the Osun state government to control congestion. These strategies have not provided the desired results due a number of reasons such as a rapid increase of population and cars, rapid growth of existing commercial activities along the central area of Osogbo and non-application of physical planning as a key tool for traffic congestion minimization.

So has to enjoy a sustainable transport system there is need for public enlightenment / regular education of road users in the study area on the need to use traffic control device (TCDs). There is also need to Decongest of activities at the central area of Osogbo so as to reduce the number of travel to the area, Construction of proper and consistent bus terminal which are not too far apart within the city, Enforcement the use of alternate route so as to minimize the number of traffic within the city centre during the peak hour of the day. It is recommended to provide parking plaza strategically within the area to curb the problem of on-street parking in the area.

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