Commuting Pattern and Transportation Challenges in Akure Metropolis, Ondo State, Nigeria

Gladys C. Emenike, Olabode S. Ogunjobi

Department of Geography and Environmental Management, University of Port Harcourt, Port Harcourt, Nigeria
gladysemenike@uniport.edu.ng

Abstract: Background: Many urban centers in Nigeria suffer from inadequate facilities that could ensure smooth urban movement. **Introduction**: The increase in commuting distance has impact on trip attraction, fares paid by commuters, traffic build-up in some land use areas; and shows the need for different modes of transportation. **Aim of the study**: The study examined the commuting pattern and transportation challenges in Akure Metropolis, Ondo State, Nigeria. **Materials and methods:** A total number of 398 copies of structured questionnaire were distributed to commuters along the selected roads (Oyemekun road, Ondo road, Oba Ile road, Arakale road, Oke Aro road, Hospital road, Ijoka road, Oda road, Danjuma road, and Sijuade road). Data obtained were analysed using descriptive and inferential statistics. **Results:** Findings showed that 52% were males and more than 70% of respondents were above 20 years. The mostly used type of transport in Akure City was public taxi (40.5%) and majority (49.7%) spent ≤ 30 minutes on the road before reaching their working place while the distance from home to work of more than 50% was ≤ 2km. The main trip purpose for commuters was education (33%) while most of the trips were made in the morning only (29.4%); and morning and evening (32.4%). However, 47.5% of commuters agreed that the peak hour of congestion is always between 7am and 9am. Findings also revealed that 55.3% agreed that the road conditions were not good while 31% and 26% of respondents agreed that the transport challenges were bad road and traffic congestion respectively. Among the selected roads, Oyemekun road (19.1%), Arakale road (12.8%) and Ijoka road (11.3%) were mostly prone to traffic congestion and the major causes of the traffic congestion were illegal parking (35.7%) and bad road (31.2%). **Conclusion:** Traffic congestion, bad road and illegal parking were the prominent problems along the road corridors and most trips are mostly generated for both educational and occupational reasons. **Recommendations:** The study therefore recommended among others that provision of off-street parking facilities in designated areas within Akure Metropolis is required and drainage facilities should be provided because of occasional flooding that may lead to the development of potholes on the roads.

Keywords: Commuting pattern, Traffic congestion, Transportation challenges, Akure Metropolis

1. Introduction

Traffic congestion, inadequate vehicular modes of transportation and environmental pollution have been the resultant effects of the increased demand for urban road transportation in the recent time **(Oyesiku, 2003; Awoyemi et al., 2012; Raji, 2013; Solanke, 2014)**. According to **Ogunsanya (2002)** cited in **Awoyemi et al. (2012)**, urban transport problems are urban traffic congestion, parking problems, traffic delays to mention but a few. Some basic problems are route inadequacy, human misuse of transport infrastructure, poor traffic management, absence of traffic and transportation planning and the upsurge in urban travel demand **(Awoyemi et al, 2012)**. However, the factors influencing urban traffic problems include financial constraints, inappropriate political decision and the absence of planning data **(Filani, 2005)**. Thus, **Olukoju (2003)** submitted that if the underlying factors influencing urban traffic problem are not properly addressed, the symptoms of malfunctioning transportation system may not be dropped.

The vibrant economic activity in most urban centres such as Akure tends to explain the high level of vehicular movement on urban roads, as people move and interact to meet their unending desires. The existence and the establishment of various financial and economic institutions, such as, banks, insurance companies and business centers, is a major factor in this regard; consequently, heavy traffic flows and traffic congestion become a viable daily occurrence **(Ogunbodede, 2007)**. Thus, Akure like most cities in Nigeria has a number of functions as centre of commerce, education, social, recreation and administrative centres, which necessitate the need for movement and interaction via road transport routes. The increase in population over the years however, has led to the increase demand and pressure on road transport, thereby accelerating transport related problems.

Many urban centers in Nigeria suffer from inadequate facilities that could ensure smooth urban

movement. This is because the rapid growth of cities anywhere in the world has impact not only for the land use but also for the spatial expansion. For example, the commuting distance of Lagos increased from 20km in 1970 to 35km in 1995 while that of Kaduna increased from 6km to 10km during the same period **(Ikya, 1993)**. In Akure, the commuting distance increased from 5.2km in 1966 to 6.4km in 1976, 10.5km in 1986, 13km in 1996 and 19km in 2006 **(Ogunbodede, 2006)**. The increase in commuting distance has impact on trip attraction, fares paid by commuters, traffic build-up in some land use areas; and shows the need for different modes of transportation. Often, coincidence arises from individual commuter's journey during peak hour periods and if this type of coincidence is not well managed, it may lead to traffic crisis that makes traveling burdensome in addition to wasting man-hour productive time. The general view is that the pattern of urban work-trips is strongly influenced by residential as well as the spatial locations of work places **(Okoko, 2008; Naess, 2004)**. For instance, urban zones with a considerable number of employment opportunities would attract to themselves large percentages of urban work-trips originating from other zones with little or no employment facilities. Thus, purely residential areas in cities are potentially zones of origin while the industrial, commercial, administrative and recreational zones are areas of destinations for most urban commuters **(Naess, 2004; Tanimowo, 2006; Okoko, 2008)**. Several studies had been done on transport challenges through commuting pattern in Nigeria, e.g. **Ikya, 1993; Bello, 2001; Ogunsanya, 2002; Olukoju, 2003; Faniran, 2005; Ogunbodede, 2006; Aderamo, 2012 and Adetunji and Aloba, 2013**; to mention a few. Majority of their studies aimed at identifying the causes and dimensions of transport problems while others were pre-occupied with various options for solving transport problems using conventional approaches. These studies have not been able to make the desired impact, judging from the traffic congestion patterns in Nigerian cities. Also studies on commuters' pattern and transport challenges in Akure Metropolis are still rare in the literature. According to **Adetunji and Aloba (2013)**, studies of urban spatial structure and work trips patterns in medium sized cities and towns like Akure, Ilesa, Ondo and Osogbo in South-western Nigeria have received little or no attention. Hence, the present study examined the commuting pattern and transportation challenges in Akure Metropolis, Ondo State, Nigeria.

2. Materials and methods:

The study was carried out in Akure Metropolis, Ondo State, South-western Nigeria. It lies approximately on latitude $7^0 15^'$ North and longitude $5^0 15'$ East (Figure 1 and Figure 2). Akure is the capital city of Ondo State, with population of about 324,000 **(National Population Commission, 2006)**. The study area enjoys equatorial tropical climate with two distinct seasons being experienced namely the dry season (November and March) and wet season (April to October). Rainfall usually begins around March/April and reaches the maximum in June, decreasing from thereafter until September/October when it finally ebbs out. Akure maintains a moderately high temperature line throughout the year. The minimum stand at about 22^oC and maximum temperature is about 34^oC while the average daily temperature is 30^oC. The annual mean temperature is about 26.6^oC. The relative humidity ranges between 64% and 87% **(Daramola, et al, 2009)**. The topography is composed of lowlands and rugged hills with granitic outcrops in several places while the geology of the study area is Pre-cambrian Basement complex rocks **(Igbekele, 2010)**. The major rivers include Owena, Oluwa, Oni, Ogbese and Ose flow through sedimentary rocks in deeply incised valleys aligned in a north-south direction, into the coastal lagoons **(Igbekele, 2010)**. The natural vegetation is the high forest composed of many varieties of hard-wood timber such as *Milicia excelsa, Antaris africana, Terminalia superba, Lophira procera* and *Symphonia globulifera* **(Daramola, et al., 2009)**. The major socio-economic activities in Akure include agriculture, commerce, health, education and sports **(Igbekele, 2010)**.

Data Sources and Collection and Sampling Technique

Structured questionnaire was the major instrument used in this study. However, 398 copies of questionnaires were distributed to the commuters. Simple random sampling technique was used to administer questionnaire to road users at 30m interval along the roads. The number of questionnaire administered was proportional to the length of the road (Table 1). The sample size of used for the study was estimated from the total number of vehicles (68,748) recorded during the traffic survey from the selected roads using Taro Yamane's formula **(Yamane, 1967)**. The questionnaire was used to elicit information on the socio-economic characteristics of urban commuters, impact of transportation in the study area, the choice of mode of transport, distance to work and frequency of journey in study area. The volumetric survey which involved the counting of different type of vehicles that make use of the roads in this axis was done using 9 Field Assistants to cover the selected roads simultaneously. These roads defined the trip generation zones and trip distribution zones in Akure Metropolis. Furthermore, the roads were classified into three categories namely federal road, state road and local road. They were also classified based on

route capacity (i.e. carriage type and volume of traffic)   (Table 1).

Table 1: Description of the selected roads

Class	Selected Roads	Carriage Type	Volume of Traffic
Federal	Oyemekun Rd	Dual	High
	Ondo Rd	Dual	High
	Oba Ile Rd	Dual	High
State	Arakale Rd	Dual	High
	Oke Aro Rd	Dual	High
	Hospital Rd	Dual	High
Local	Ijoka Rd	Single	Low
	Oda Road	Single	Low
	Danjuma Rd	Single	Low
	Sijuade Rd	Single	Low

Method of Data Analysis

Data obtained were analysed using descriptive and inferential statistics. Descriptive statistical tools such as table, percentage, bar chart and pie chart were used to represent the data. The statistical package for social sciences (SPSS) version 20.0 software for windows was for the analysis.

3. Results and Discussions
Socio-economic characteristics of respondents

The socio-economic characteristics of respondents are presented in Table 1. The analysis on the sex distribution shows that 206 (52%) were males while 192 (48%) were females. More than 80% of the respondents were 20 years and above. However, 15.3% of respondents had primary education, 22.6% had secondary school while 62.1% had tertiary education. The educational levels of respondents all respondents could read and write and understanding the instrument of the survey may not be difficult. Majority of the respondents were students (35%); civil servant (22%) and self-employed (20%) were other type of occupational status of respondents.

Commuting pattern in Akure Metropolis

The nature of commuting patterns expressed in terms of trip zone traffic level, mode of transportation, reasons for choosing a particular mode of transportation and time spent on the road are presented in Table 2. The analysis shows that the commuting pattern of trip across different traffic zones in Akure were higher in Alagbaka zone (12.6%) and FUTA (12.5%). The traffic level in Araromi, Erekesan and Shasha markets were lower. The higher traffic experienced in Alagbaka and FUTA may be attributed to the fact that the former is an administrative environment while the latter was an academic or institutional environment. Transport mode choice among the respondents shows that 28.6% made use of public taxi, 23.6% made use of motorcycle, 18.8% made use of private car, 17.1% made use of public bus

while 11.8% made use of trekking. This indicates that most of the respondents patronize public transport for commuting from one place to another. Considering the reason for using the mode of transport, majority (38%) believed that they chose the means of transport because it is fast while 26% said it was affordable, 21% comfortable while 15% said it was reliable.

Table 1: Socio-economic characteristics of respondents

Sex	Frequency	Percentage (%)
Male	207	52
Female	191	48
Total	**398**	**100.0**
Age	**Frequency**	**Percentage (%)**
Below 20	71	17.8
20-30	146	36.7
31-40	89	22.4
41-50	50	12.6
51 and Above	42	10.6
Total	**398**	**100.0**
Educational Level	**Frequency**	**Percentage (%)**
Primary	61	15.3
Secondary	90	22.6
Tertiary	138	34.7
Post Graduate	109	27.4
Total	**398**	**100.0**
Occupation	**Frequency**	**Percentage (%)**
Student	139	35
Civil Servant	88	22
Self Employed	80	20
Business	48	12
Others	44	11
Total	**398**	**100.0**

Findings also revealed that more than 60% of total respondents spent 60 mins or less on road before reaching their destinations while 14.8% spent more than 60 mins but less than 90 mins.

Moreover, 60.1% of respondents travelled a distance 2 km or less from their residence to their places of work. The analysis has shown that majority lived close to their places of work and thus, time spent by them to reach their places of work from their house is less than 1 hour.

Table 2: Commuting Pattern in Akure Metropolis

Traffic Level in traffic zones	Frequency	Percentage (%)
Alagbaka	87	21.8
FUTA	85	21.3
Araromi	76	19.1
Erekesan	76	19.1
Shasha	74	18.6
Total	**398**	**100.0**

Type of Transport	Frequency	Percentage (%)
Private car	75	18.8
Public bus	68	17.1
Public taxi	161	40.5
Okada (Motorcycle)	94	23.6
Total	**398**	**100.0**

Reason for Mode of Transport	Frequency	Percentage (%)
Fast	107	27
Affordable	103	26
Reliable	60	15
Comfortable	84	21
Only Available one	44	11
Total	**398**	**100**

Time spent on Road	Frequency	Percentage (%)
0-30	149	49.7
31-60	40	22.4
61-90	10	14.8
Other	4	13.1
Total	**398**	**100**

Distance from home to work (km)	Frequency	Percentage (%)
0-1	120	30.2
1-2	119	29.9
2-3	79	19.8
3 and above	80	20.1
Total	**398**	**100.0**

Table 3: Purpose and Time of Trip and Implication of the extent road

Trip Purpose	Frequency	Percentage (%)
Education	131	33
Social	48	12
Commercial	123	31
Religion	56	14
Other	40	10
Total	**398**	**100.0**

Time of the day when the trip is made	Frequency	Percentage (%)
Morning	117	29.4
Afternoon	49	12.3
Evening	54	13.6
Morning and Evening	129	32.4
Morning and Afternoon	49	12.3
Total	**398**	**100.0**

Peak Hour for Congestion	Frequency	Percentage (%)
7am-9am	189	47.5
9am-11am	44	11.1
11am-1pm	41	10.3
1pm-3pm	44	11.1
3pm-5pm	48	12.1
5pm and above	32	8.0
Total	**398**	**100.0**

Implication of existing pattern	Frequency	Percentage (%)
Long travel time	79	19.8
Street trading	83	20.9
Traffic congestion	166	41.7
Noise and air pollution	70	17.6
Total	**398**	**100.0**

Purpose and Time of Trip and Implication of Existing Commuting Pattern

Findings showed that 33% of the respondents commute for educational reason, 31% for commercial reason while 14% for religion reason and 12% for social (Table 3). However, 29.4% of total respondents made their trip in the morning only, 12.3% made their trip in the afternoon, 13.6% made their trip in the evening while 32.4% made their trips in the morning and evening (Table 3). This implies that the majority of the trips made were in the morning and evening. The study also reveals that majority (47.5%) agreed that the traffic congestion peak hour was between 7am and 9am while just 8.0% agreed on 5 pm and above (Table 3). The analysis on the implication of existing commuting pattern reveals 41.7% respondents had

opinion that it caused traffic congestion while 20.9% opined street trading, 19.8% deduced long travel time and the remaining 17.6% agreed to noise and air pollution (Table 3). It could be deduced that the major implication of commuting pattern in Akure Metropolis was traffic congestion.
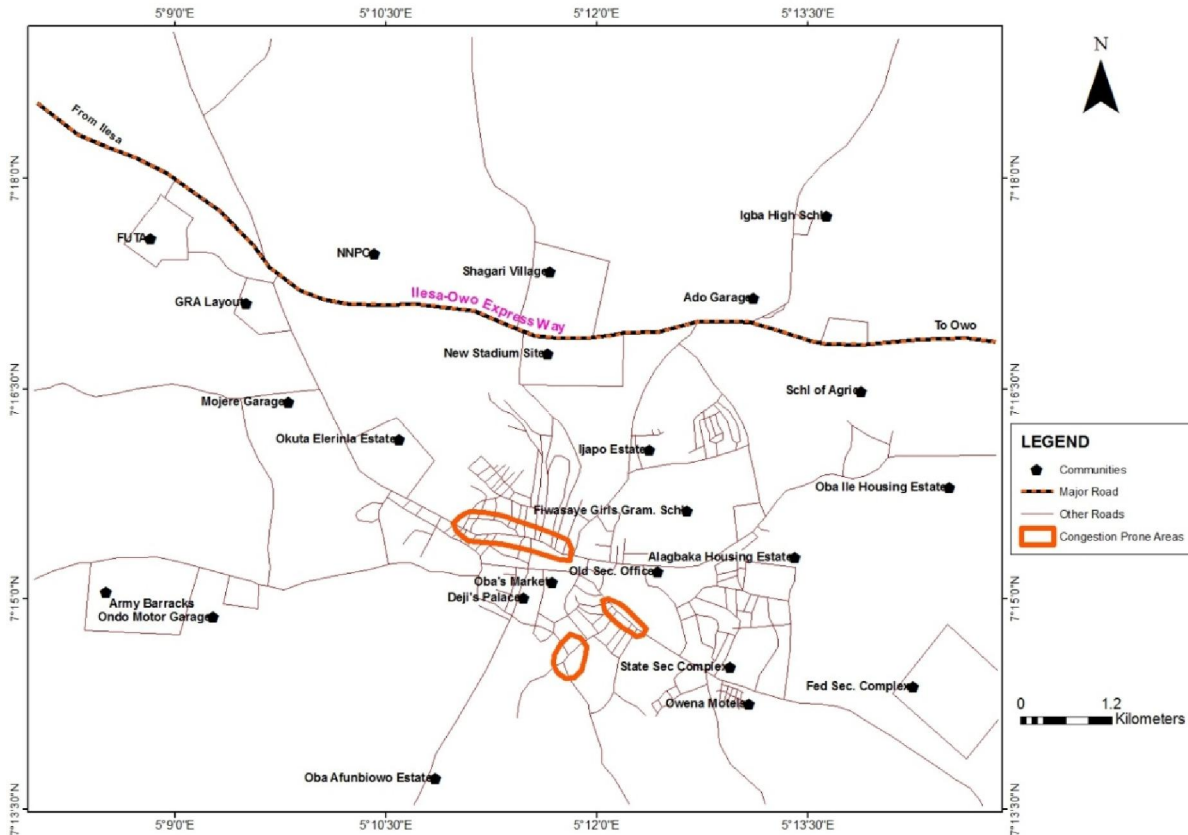

Figure 2: Traffic Congestion Prone Areas in Akure Metropolis

Road Condition and Transportation Challenges in Akure Metropolis

Table 4: Road Conditions and Transportation challenges

Road condition	Frequency	Percentage (%)
Tarred Road	135	33.9
Unconstructed road	102	25.6
Dilapidated road	64	16.1
Under construction	54	13.6
Any other (Specify)	43	10.8
Total	**398**	**100.0**
Transport challenges	**Frequency**	**Percentage (%)**
Traffic congestion	103	26
Bad Road	123	31
Narrow Road	64	16
Illegal Parking	68	17
Others	40	10.6
Total	**398**	**100.0**

The road condition and transportation problems are presented in Table 4. It is shown that 33.9% of total respondents agreed that the roads were tarred, 25.6% agreed that the roads were yet unconstructed while 16.1% attested that the roads were dilapidated. Furthermore, 31% of respondents said that the problem that affect transport was bad road, 26% agreed to traffic congestion, 16% believed that the roads were narrow while 17% attested to illegal parking.

Traffic routes prone to congestion and Reason for Traffic Congestion

Traffic routes prone to congestion and reasons for traffic congestion in the selected roads are shown in Table 5. The analysis shows that 19.1% of the respondents believed that Oyemekun road was prone to congestion, while 12.8% opined that the most congested was Arakale road. However, 8.0%, 9.5%, 10.6%, 7.8%, 8.3%, 8.0%, 8.5% and 7.3% of the respondents opined that the most congested road were Oke Aro, Hospital, Ijoka, Danjuma, Sijuwade, Ondo,

Oda, and Oba-Ile road respectively. Figure 2 also shows the portions of the road where congestion usually occurs. Despite the dualization of Oyemekun road and Arakale road, these two roads were still most prone to congestion because the roads were distributor road that distribute traffic and collect traffic from the collector roads within the city of Akure. The roads were prone to congestion due to illegal parking (35.7%), sales on the road (11.3%), bad road (31.2%) and spoiled vehicles on the road (11.3%). Both illegal parking and bad roads were observed to have mostly caused traffic congestion in Akure Metropolis.

Table 5: Traffic prone to congestion and reasons for the traffic congestions

Traffic prone to congestion	Frequency	Percentage (%)
Oyemekun Rd	76	19.1
Arakale Rd	51	12.8
Oke Aro Rd	32	8.0
Hospital Road	38	9.5
Ijoka Rd	42	11.3
Danjuma Rd	31	7.8
Sijuade Rd	33	8.3
Ondo Rd	31	7.8
Oda Rd	33	8.3
Oba Ile Rd	29	7.3
Total	**398**	**100.0**
Reasons for Traffic prone to congestion	**Frequency**	**Percentage (%)**
Illegal parking	142	35.7
Sales on the road	45	11.3
Bad road	124	31.2
Spoiled vehicles on the road	45	11.3
Others	42	10.6
Total	**398**	**100.0**

4. Conclusion:

This study has examined the commuter's patterns nature and transportation problems in Akure Metropolis. The study has shown that traffic congestion, bad road and illegal parking as the prominent problems along the selected road corridors. Trips in the study area are most generated for both educational and occupational reasons.

5. Recommendations:

Based on these findings, this study suggested the following recommendations:

1. Provision of off-street parking facilities in designated areas within Akure Metropolis is required.

2. Drainage facilities should be provided because of occasional flooding that may lead to the development of potholes on the roads.

3. Provision of traffic lights at major road junctions in the cities should be encouraged to control large volumes of traffic especially at peak periods.

4. Complete separation of vehicles should be encouraged to reduce pedestrian-vehicular conflicts in Akure Metropolis especially where there are large concentrations of pedestrians. This could be achieved by creating barriers, overhead foot bridges or under passes and providing zebra crossings on major roads.

5. Roads in our cities should be regularly maintained by the Road Maintenance Agencies through the three tiers of government in Nigeria.

References
1. Aderamo, J.A. (2012): Urban Transportation Problems and Challenges in Nigeria: A planner's view. Prime Journals, 2(3):198-203.
2. Adetunji, M. A. and Aloba, O. (2013): Urban spatial structure and work trip patterns in Southwestern Nigeria: The example of Ilesa. Journal of Geography and Regional Planning, 6(4): 93-102.
3. Awoyemi, O. K., Ita, A. E., Oke, M. O., Abdulkarim, I. A. and Awotayo, G. P. (2012): An Analysis of Trip Generation and Vehicular Traffic Pattern in Akure Metropolis Ondo State, Nigeria. Journal of Social Science and Public Policy, 4: 33-43.
4. Bello, S.A. (1994): Urban Public Transport in a Growing City: The Case of Ilorin, Nigeria. An Unpublished Ph.D. Thesis Submitted to the Department of Geography, University of Ilorin, Ilorin.
5. Daramola J.O., Adekunle M.F., Olaniyi M.O, Alayaki F.M (2009): Diagnostic Survey Report of Ondo State Agricultural Product, University of Agriculture, Abekuta.
6. Filani, M. O. (2005): Rail Transportation as a Mechanism for Sustainable Economic Development of a Nation. Ago-Iwoye Journal of Social and Behavioural Sciences, 1(1), 4-10.
7. Igbekele A. (2010): "Akure City Profile". International Water Management Institute. 4P.
8. Naess P. (2004): Urban Structure and Travel Behaivour Experiences from empirical research in Norway and Denmark. Aalborg University, Aalborg Denmark Mark. E-mail: peter @ plan auc. Dk Ejtir 3(2):155-178.
9. National Population Commission (NPC), (2006): National Population Commission. Population Figures for Nigeria States. www.nigerianmuse.com/20070820063612zg/.../nigeria-2006-population. 29/08/2015.
10. Ogunbodede, E. F. (2000): Telecommunicating and travel pattern. A preliminary assessment of the state of practice of use of GSM in Lagos

state. Being a paper presented at the 45th Annual conference of the Nigeria Geographic association held at the University of Ilorin between 28th may and 4th June.

11. Ogunbodede, E. F. (2007) Assessment of Traffic Congestions in Akure (Nigeria) using GIS Approach: Lessons and Challenges for Urban Sustenance. Department of Geography and Planning Sciences, Adekunle Ajasin University, Ondo State, Nigeria.

12. Ogunsanya A.A. (2002:) Makers and Breakers of Cities. An Inaugural Lecture Delivered at the University of Ilorin, Ilorin, Kwara State, Nigeria.

13. Okoko, E. (2008) Gender and Transport: Women's Proclivity to Minimize Car Use in Akure, Nigeria. Pakistan Journal of Social Sciences, 4(1):56-63.

14. Olukoju, A. (2003) Infrastructure Development and Urban Facilities in Lagos, 1961-2000. Lagos Historical Review, Vol. 3: 196-204.

15. Oyesiku, O. 2003, Sustainable Transportation Strategies for Intermediate Cities in Nigeria. Journal of the Nigerian Institute of Town Planners, XVI (1):35 – 44.

16. Raji, B.A. (2013): Spatio-Temporal Analysis of Pedestrian Traffic in Ikeja Area, Lagos. Unpublished Ph.D Thesis, University of Ibadan.

17. Solanke M. O. (2014): Socio-economic Determinants of Intra-urban Trips Generation in Ogun State, Nigeria. Current Research Journal of Social Sciences 6(1): 15-20.

18. Tanimowo N.B. (2006): Land Use Mixed and Intra-Urban Travel Pattern in Ogbomoso, a Nigerian Medium Sized Town, Journal of Human Ecology, 20(3):207-214.

12/25/2017