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Mobility of the Poor in Akure Metropolis: Income and Land Use Approach.

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Abstract
Nigeria being a developing economy still has a high percentage of low income earners. Mobility and modal choice affect us all in our daily life whether we are commuting to work or for recreational purpose. Catering for the effective and efficient mobility of this unique set of low income earners is a task for transport planners. This research assessed the mobility of the poor using land use and level of income. The study area was divided into six zones based on the land use configuration.Income level, frequency of trip and the predominant modal choice for both work and business trip were evaluated. The result showed that the use of taxi and motor cycle in the study area is high. The low income group has the highest frequency of trip base on the level of income and land use. The result of this research will aid the government at all levels and policy makers in formulating a good transportation scheme for the low income earners now and in the foreseeable future. It will also provide policy makers with an improved understanding of the travel behavior of the poor and their preferred modal choice.
Keywords: (Poor, Low Income Earners, Modal Choice, Land Use, Income)

1.1 INTRODUCTION

Assessment of the impact of income on transportation and trip demand among the low income earners is paramount because transportation is part of our daily need and the percentage of the poor in Nigeria is enormous. In the recent report by World Bank, Nigeria was ranked third among worlds ten countries with extreme poor citizens. The same organization states that 70 percent of the population live on 1.25 dollar or less per day and that 7 percent of the 1.2 billion people in the world are Nigerians (w0rld Bank ,2014) .These stated amount encompasses all the necessity of life (food, house ,medical etc.). National policy recognizes the importance of paying for food, housing, and medical care. Federal policy in Nigeria leaves the task of inta – city transport scheme to the state and local government with little or no fund.

The aim of the research is to discover the factors that influence modal choice of low income group in the study area the results of the research will provide policy makers with an improved understanding of travel behavior of the poor and the preferred modal choice. This will aid decision and policy makers in formulating a good transportation scheme for the low income earners now and in the foreseeable future regions of India have occurred because of the employment opportunities created by rapid industrialization mobility and accessibility are important factors in both social and economic prosperity of a region. They affect us all in our daily life whether we are commuting to work or travelling on business, alms of this study are to try to find out the impact of household income on the total public transport demands and on the choice of rail transport for travel. The household income was selected to test because it is an important variable in trip generation and also

1.2 *Theoretical background*

Low-income households are a unique set of population segment whose modal choice behavior is particularly relevant for transport policy planning.

The significance of mobility in our daily endeavor is gigantum without which basic needs would not be accomplished (Busari et.al, 2015). Problems relating to trip demand and generation have been managed well in some developed countries while it has continued to defy solutions in the developing world as stated by (Ogunmodede, 2009). Transport demand models aim to estimate the amount of travel which will take place under a given set of assumptions. Broadly speaking these assumptions can be separated into two components: those relating to the demographic composition of the population (for example, age, proportion of labour force over the whole population and occupation), together with other external changes (for example, land-use, income, car ownership etc.), and those relating to transport system. (Ho Hing, 1999) Mobility and accessibility are important factors in both social and economic prosperity of a region. This is because mobility and modal choice affect us all in our daily life whether we are commuting to work or travelling on business. A lot needs to be done in the transportation infrastructure because this has been the neglected aspect of transport system. The state of transport system is expected to be efficient, affordable, adequate, safe, well integrated and environmentally sound. (Igwe, 2013) Travel demand forecasting process is a fundamental operation within any urban transport planning exercise (Owolabi, 2009). Hence highly educated persons often obtain more specialized jobs which are

generally concentrated in high density or central business district office parks; as a result people with higher education are more involved in long distance commuting and their car use is higher (Dargay and Hanly,2004; Dieleman *et al.* 2002; Kockelman 1997 ; Schwanen *et al* 2002,2004; Stead 2001).It therefore means that transport infrastructure needs to be developed so as to ensure that movement of people and goods takes place speedily, economically safely, comfortably and in an environmentally-friendly manner (Sumaila, 2012).

2.1 METHODOLOGY

STUDY AREA

The city Akure is the state capital of Ondo state in the South Western part of Nigeria. Akure is a medium- sized urban Centre. The increased relative political influence of Akure as a state capital since 1976 has greatly promoted its rapid growth and increased socio-economic activities resulting in its spatial expansion from an area of about 16 squares kilometers in 1980 to about 30 square kilometers in 2000 (Ministry of Works, Lands and Housing, 2000). The 1991 national population census however, puts the population of Akure at 239,124 and its estimated population in 2006 was 353,211 (NPC, 2006). As a result of its designation as a State Capital in 1976, Akure experiences more increased population growth compared to other towns in Ondo State

2.2 *Sampling Procedure and Data Collection*

The study area according to the Land use map configuration has six residential zones (Figure 1). The zones are; High density Residential zone, Medium density Residential zone , Low density Residential zone,, Commercial and Military density residential Zones. The low income earners in these six zones were considered Secondary and primary data collection was adopted. The primary data involved the interview of residents according to the land use configuration. The secondary data involves the use of a detailed questionnaire of about 1000 distributed equally among respondents in the study area.

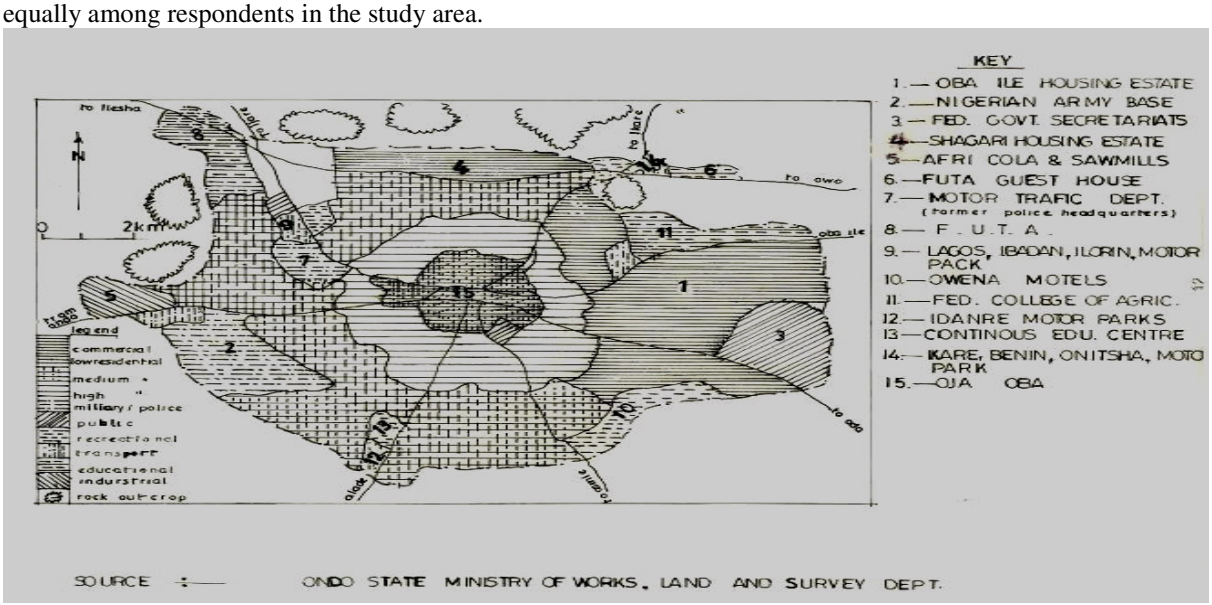

Figure 1: Land use map of Akure

2.3 *Information Gathered*

The questionnaire asked individuals about the type of trips, the available mode ,the preferred mode journeys they frequently make, the modes they choose to use, , Time of making the trip, Purpose of trip, , Trip distance, Cost of trip etc**.** The data collection took about nine month. The household income was selected to test because it is an important variable in trip generation and took the form of an interviewer-administered questionnaire. This analysis was based on trips of persons aged 18 years and older. These persons were considered to undertake trips relatively independently.

3.1 RESULT AND DISCUSSION

This research establish the fact that the low income group has the least number of cars figure 1,2and 3.The high income group accounts for the highest no of car this buttresses the findings of Busari et al,2015.that income is positively related to car ownership. Since the low income earners account for the least number of personalized vehicles they assess other modes for trips.

Table 1 shows the demographic characteristics of the respondent based on land use approach.

3.2 *Modal Choice Assessment Based On Land Use Configuration*

Based on the land use configuration, six zones were considered. The modal split of respondent was assessed, Figure 2 shows that Bus as a transport mode is not common in Akure metropolis compared to other state capital .According to this research, the highest percentage of the sample size that uses bus as a modal choice is 4.5% Table 4.1 Taxi as a modal choice is widely and mostly used among low income group. Figure 4.8 shows the relationship between income and modal choice, the low income group has a percentage of 76.9%.Motorcycle is generally owned by the male gender and used mainly because it provides door to door services, it is cheap and fast the more reason why it is embraced within the high density residential zone and the commercial zone. Generally in the study area the use of taxi is widely used for both work and recreational trips because it is readily available and cheap. Bus as a transport mode is not common in Akure metropolis compared to other state capital .According to this research, the highest percentage of the sample size that uses bus as a modal choice are both the high density, commercial zone and the medium density residential zone. The use of walk as a mode is uniformly distributed in all the zones considered. Most respondent walk to assess other modes.

Table 1: Demographic Characteristics of Akure

FACTORS	High Density	Low Density		Medium Density		Educational Zone	Commercial Zone
GENDER							
Male	40.43%	47.80%	50.73%	65.74%		58.60%	60.58%
Female	59.57%	52.14%	49.27%	34.26%		41.40%	39.42%
OCCUPATION							
Students	29.75%	24.43%	31%	70.29%		23.71%	9.70%
Civil Servant	21.12%	65.57%	54%	19.60%		30.11%	69.29%
Traders	48.12%	10.11%	15%	10.10%		46.27	21%
MARITAL STATUS							
Single	63.50%	70.30%	75.40%	28%		72.40%	86.70%
Married	46.50%	29.70%	24.60%	72%		27.60%	13.30
AGE RANGE							
>20 years	7.50%	13.77%	2.81%	14.58%	17.92%	21.68%	21.68%
21-30 years	57.50%	48.70%	48.20%	76.96%	50.40%	47.58%	47.58%
31-40 years	24%	25.30%	26.60%	5.31%	12.57%	13.11%	13.11%
41-50 years	4.70%	6.74%	7.86%	0.01%	10.43%	11.97%	11.97%
51-60 years	5%	3.44%	2.47%	0.01%	5.48%	5.19%	5.19%
61-70 years	1%	1.88%	2.04%	2.01%	3.21%	0.99%	0.99%

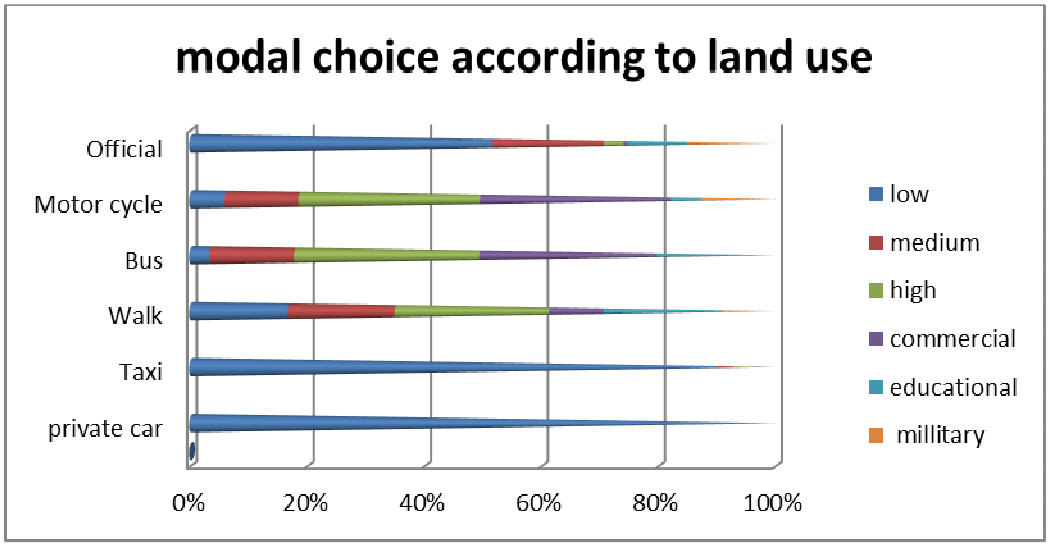

Figure 2: Modal Choice According To Land Use

3.3 *Income Approach*

The low income group patronizes the use of both taxi and motorcycle for both work and business trip table 2. Most low income earners are majorly petty traders, housewives, students etc. and are constrained to either working in their local environs or in locations readily accessible by public transport. Base on the income approach taxi as a mode accounts for the largest percentage of the preferred and patronized mode by the low income earners, compared to the other income group. Several factors are responsible for this. Most of the respondents are of the opinion that it is cheap, safe and readily available. The use of Tri-cycle and bicycle is not embraced within the study area compared to other major city in southwest.

The use of motorcycle is prominent. Table 2 also buttresses the fact that the use of bus in the study area is low.

Table 2: Modal choice based on level of income

INCOME RANGE	PRIVATE CAR	TAXI	WALK	MOTORCYCLE	BUS	BICYCLE
LOW	**2.00%**	76.90%	**5.80%**	10.60%	4.50%	0.13%
MEDIUM	**54.90%**	36.30%	**0.82%**	4.50%	2.08%	0.14%
HIGH	**94%**	0.82%	**2%**	2%	0.80%	0.62%

3.4 *Frequency Of Trips*

Trip is the movement from a single origin to a single destination. This table shows the per capita frequency of trips i.e. number of trips per person. High density residential zone which is majorly dominated by the low income group see Figure 2, accounts for the highest per capital frequency of trip, while the low density residential zone (Ijapo Estate oba-ile Estate,Alagbaka) account for the lowest percentage of per capital trip this may be as a result of the fact that they engage in planned trip and because of the income status of the respondents (figure 3) Commercial zone has the second largest trip due to the fact that it is a business prone zone and as a result there is a frequent need to engage in business trip. From the same figure it was realized that the educational zone also possess a large per capital trip rate also this due to the fact that the location of school is within the environ and majority of the respondent says they embark on school and work trip more than once daily. Table 3

Table 3: Per Capita Frequency of Trip

Land Use Area	No of Persons	No of Trips	Weekly per capita trip	Daily Trips Per Capita
Low Density	2882	45,085	15.64	2.23
High Density Zone	6004	117,180	19.5	2.82
Medium Density Zone	3602	67608	18.76	2.68
Educational Zone	7205	138216	19.18	2.73
Commercial Zone	3842	73615	19.16	2.78
Military Zone	480	9013	18.77	2.68

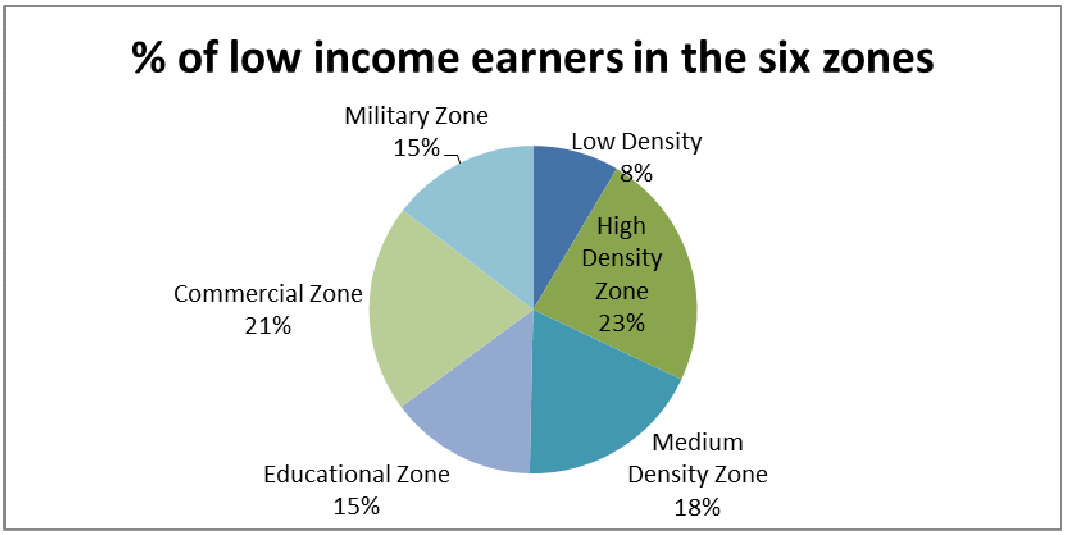

Figure 3: % of low income earners based on land use of Akure

From figure it can be established that the low income group has the highest frequency of trips in Akure. The highest frequency of trips was in the educational Zone (FUTA north gate and South gate area).This is because this zone is dominated by students.. It is therefore very important for the government to cater for the mobility of this unique income group.

TABLE 4: FREQUENCY OF TRIP BASED ON INCOME AND LAND USE APPROACH

FREQUENCY OF TRIP	LOW INCOME GROUP	MEDIUM INCOME ZONE	HIGH INCOME GROUP
Medium density residential zone	59.56%	29.90%	12.22%
High density residential zone	65.60%	22.80%	11.28%
Low density residential zone	55.30%	19.64%	25%
Educational zone	88.62%	6.70%	4.68%
Commercial zone	72%	22.38%	5.40%
Military zone	57%	38.46%	4.50%

4.1 CONCLUSION

Mobility and accessibility are important factors in determining both social and economic growth of a nation. The research established the fact that this unique income group depends on the use of public transit to embark on daily trips (both recreational and work Trip).since their income status does not enhance the ownership of personal car. From the land use approach and the income approach taxi and motorcycle are predominantly used since buses and tricycle are not readily available.

The low income earners have the highest frequency of trips based on both income and land use approach .The highest percentage of the low income earners is in the high density residential zone. This group accounts for the largest volume of total trip and per capita trip.

This will aid decision and policy makers in formulating a good transportation scheme for the poor now and in the foreseeable future.

Recommendation

The government and policy maker should focus on making government owned public transit available within Akure metropolis at a reduced price to make transportation more available for this set of income earners.

Government should focus on improving the transport needs of the poor for both Inter-Transit and Intra-Transit transport scheme.

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