

Full Length Research Paper

Analysis of the travels of public transport passengers (road) in Ikorodu, Lagos, Nigeria

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This paper investigated the travels of public transport passengers' (road) from Ayangburen Taxi Park, Ikorodu, Lagos, Nigeria with a view toward identifying its challenges and contributions to travel demand. The sources of data used were the structured questionnaire and past literature. The primary data types used were on routes, schedules, travel cost, number of vehicles, number of vehicles' daily travels, travel time, travel cost, travel length in temporal term, travel purpose, passengers' waiting time and travel frequency, unexpected breakdown, fuelling challenge, accidents, long journey time, frequent stops. The study used the total number of passengers in ten round trips of a particular day for the sample frame (1,240). The sample size for this study was 10% of the sample frame which translated to 124 completed questionnaires. The sampling technique used for this study was the purposive sampling method because of the lack of pre-determined population and unequal chances for passengers' representation. The sampling procedure entailed the identification of the motor park, selection of the cabs through the designed method and conduction of the survey directly with the operators and passengers, in order to obtain the relevant data in accordance with the structured questionnaire. Data were analysed through the descriptive (frequency tables) and inferential analyses (stepwise multiple regression). The study found that, the average age of passengers was 36 years, whose average income was N15, 000. The travel characteristics of passengers revealed that, average passengers' waiting time for cab was < 15 min, the average travel frequency was 8 times per week, the average travel time was 45 min and the passengers' average travel length was 1500 m. The inferential model revealed that, the temporal length of trip and waiting time ($R^2 = 30.1\%$) of respondents made significant contributions to the travel demands of the passengers in the study area. The study concluded with pragmatic strategies such as the provisions of more cabs, fare subsidies and so on, in order to provide a more efficient public transport system in the study area.

Key words: Road, public transportation, passengers' travels.

INTRODUCTION

Challenges in Nigeria's economy, which was part of the global depression of the 1980's affected all sectors in which transport system was one of them. Majority of Nigerians living in cities felt this impact more than those in the rural areas. This was because, the commuting distance of people in cities increased considerably, than it used to be before 1980 (Ogunbodede, 2008). Transport development is a growth generating infrastructure in relation to the process of socio-economic development; it facilitates the development of growth poles and centres and should be a fore-runner in the developmental process of any nation (Oyesiku, 2002). It should provide a social base for the take off of any economic development process. It should increase liveability, serviceable

connectivity, interaction and transformation and should ensure changes as have been initially identified by Mabogunje (1986) and cited in Badejo (2000). The consequences emanating from public transportation system are encased in economic, social and environmental impacts.

In the last few years, researchers, planners and transport experts have been raising alarm over the unregulated growth pattern of settlements without corresponding and complementary public transport (Lagos Metropolitan Area Transport Authority, 2010). It has become quite obvious that public transportation has failed to keep pace with the rate of expansion and demands of economic growth in Lagos. From newspaper articles to

empirical findings, the evidence is always the same and shows that, public transportation in Lagos is chaotic (Bawa-Allah, 2000).

Also, Badejo (2000) and Oyesiku (2002), at different times perceived transport as one of the elemental factors for any land use development pattern, it forms intrinsic part of settlement development needed to open up regions and provide access to natural resources. It also promotes inter-communal trade and aids in territorial defence. In conjunction with the aforstated definition, Peter (1982) in his study on transport and society submitted that transport usually stimulates and enhances productive human development in any society. From the foregoing, it can be established that public transport provides the mobility required for inter-tribal, international and finally inter-continental exchange and trade (UNCHS, 2001).

Other relevant studies in the area of urban transportation confirmed that more than 75% of population in cities depended on public transport while about 25% depended on private transport system (Ogunbodede, 1990; Ogunjumo, 1986; Okpala, 1981; Mrakpor, 1986). The socio-economic variables of Nigerians contributed in no small measure to this pattern. Public transport system, which is an aspect of the country's transport sector, had all along been in the hands and control of Nigerian private entrepreneurs. Thus, the private owners dictated largely the modus operandi of the nation's public transport system. In the early 1960s, the macro-economic indicators, which are yardsticks for measuring all aspects of the growth of Nigeria's economy, were consistently positive. This was because the nation depended much on agricultural products for its foreign exchange earnings and a low proportion of the population were engaged in white-collar jobs. During this period, a number of private individuals owned private vehicles, which they used for both intra and inter-urban movements, especially in Lagos.

However, the problems facing the urban centres of Lagos State are not only many but also very complex; one of the most apparent, being intra-town mobility (Badejo, 1990). Intra-town transportation problems include traffic congestion, poor road facilities, poor environmental condition, road degradation, insufficient right of way, air and environmental pollution (Lagos Metropolitan Area Transport Authority, 2010). The problem with linkages within Lagos has existed for a long time and so Lagos has been known for its massive traffic congestion worldwide (Ladele, 2010). Presently, the traffic management apparatus is not efficient and effective and it indirectly contributes to the problems rather than solving them. It is in light of this that this study focused on the nature of road public transport passengers' travels with a view to identifying the challenges of the passengers and operators in the study area. To do so, the study investigated the contributions of the passengers' travels characteristics to the travel demands from

Ayangburen Taxi Park, Ikorodu.

Study area (Ayangburen taxi-park)

Ikorodu is located in the eastern part of Lagos State as Ayangburen Taxi Park is located in Ikorodu Motor Park, Ikorodu, Lagos, Nigeria. The taxi park has been in existence since 1984 and it is located at Ikorodu garage, within Ikorodu Central Local Government area. The park operates under the supervision of Lagos State Taxi and Cab Operator Association. There are about 31 vehicles on average operating in the park, with carrying capacities of four passengers per vehicle. Each drivers pays tax to the Lagos State government through the headquarters of taxi and cab operators association. This amounted to the sum of ₦3, 750, which was increased in December 2010 to ₦4, 000 per annum. The drivers also buy tickets worth ₦100 that gives them the licence to operate every day. The park started operation with a fare of about 50 Kobo per trip but the present fare for the operation is ₦50 (from Ikorodu to Igbogbo) and ₦40 (from Ikorodu to Ebute).

METHODOLOGY

Data used for this study were obtained through primary (structured questionnaires) and secondary (past literatures) sources. The primary data collected were on operations of the public (cab) transportation system (routes, schedules, travel cost, number of vehicles, number of vehicles operating per day), travel characteristics of passengers (travel time, travel cost, travel distance, travel purpose, passengers' waiting time and travel frequency) and operators' and passengers' challenges (unexpected breakdown, fuelling, accidents, long journey time, long waits, frequent stops.).

The study adopted the total number of passengers in each cab for single round trip of a particular day as the sample frame. The average capacity for a cab on these routes is four (4) passengers per cab and there were 31 cabs in the motor park on the average. The pilot survey showed that, an average cab travels 10 times daily (ten round trips), which puts the entire average number of passengers at 1240 for a particular day, since the cabs must be fully loaded before travel.

This is the sampling frame for the study. The sample size is 10% of the sampling frame which translates to 124 questionnaires; this represented the total number of respondents (passengers) that were interviewed. In addition, 31 drivers were interviewed in order to obtain data on the challenges they face. The sampling technique used for this study is the purposive sampling method because of the lack of pre-determined consistent population and passengers' chances of not being selected. The sampling procedure entailed the identification of the motor park, the selection of the cabs at the motor park and conducting the survey using a structured questionnaire. This was conducted on passengers until a sample size of 10% was achieved. Descriptive and inferential analyses were used for data analysis. The descriptive analysis entailed the use of frequency tables in order to get a general understanding of the operations, travel characteristics and challenges of respondents.

The inferential analysis entailed the use of stepwise multiple regression analysis in order to inquire into the contributions of the passengers' travels characteristics to the travel frequency.

Table 1. Travel times per week.

Travel times per week	Frequency	Percent
<5	47	37.9
5-10	68	54.8
>10	9	7.3
Total	124	100.0

Table 2. Time spent per trip on the average.

Time spent per trip (min)	Frequency	Percent
<20	19	15.3
20-40	65	52.4
41-60	34	27.4
>60	6	4.8
Total	124	100.0

Table 3. Length of trip of respondents.

Trip length of respondent (m)	Frequency	Percent
500-1000	28	22.6
1000-1500	26	21.0
>1500	70	56.5
Total	124	100.0

Table 4. Purpose of the trip of respondents.

Trip purpose	Frequency	Percent
Business	31	25.0
Work	18	14.5
Leisure	3	2.4
Residence	28	22.6
School	6	4.8
Recreational	3	2.4
Others	35	28.2
Total	124	100.0

MAJOR FINDINGS

Passengers' travel characteristics

Travel times per week

As shown in Table 1, the study revealed that, 47 (37.9%) of the respondents travelled by this cab for less than 5 times per week, 68 (54.8%) travelled between 5 to 10 times per week and 9 (7.3%) travelled above 10 times weekly.

Time spent per daily trip

As shown in Table 2, 19 (15.3%) of the respondents spent less than 20 min per daily trip, 65 (52.4%) respondents spent between 20 to 40 min per daily trip, 34 (27.4%) respondents spent between 41 to 60 min per daily trip and 6 (4.8%) respondents spent above 60 min per daily trip.

Trip distance of respondents

Table 3 shows that, 28 respondents (22.6%) had trip distances of between 500 to 1000 m, 26 (21%) had trip distances of 1000 to 1500 m and 70 (56.5%) had trip distances above 1500 m.

Purpose of the respondents' trip

As shown in Table 4, the purposes of the respondents' travels were travelling for business 31 (25.0%), to work 18 (14.5%), for leisure 3 (2.4%), to their residence 28 (22.6%), for educational purposes 3 (2.4%), for recreational purposes 3 (2.4%) and for other purposes were 35 (28.2%).

Waiting time of passengers

The study showed in Table 5 that, 74 (59.7%) of the respondents waited for less than 10 min before they boarded the cab, 37 (29.8%) of the respondents waited for between 10 to 15 min and 13 (10.5%) respondents waited for between 16 to 20 min before boarding.

Operators' challenges

Unexpected breakdown of vehicles

As shown in Table 6, that 12 (38.7%) of the drivers' vehicles experienced unexpected breakdown less than 2 times in a month, 11 (35.5%) of the drivers' vehicles experienced unexpected breakdowns between 2 to 4 times in a month and 8 (25.8%) of the respondents' vehicle experienced unexpected breakdown between 5 to 6 times in a month.

Fuelling difficulties in a month

As can be seen in Table 7, 14 (45.2%) drivers experienced trouble finding fuel at a station less than 2 times in a month, 15 (48.4%) drivers experienced fuelling difficulties between 2 to 4 times in a month and 2 (6.4%) drivers experienced fuelling difficulties between 5 to 6 times in a month.

Table 5. Passengers' waiting time for cab.

Waiting time for respondents (min)	Frequency	Percent
<10	74	59.7
10-15	37	29.8
16-20	13	10.5
Total	124	100.0

Table 6. Unexpected breakdown of vehicles in a month.

Monthly unexpected breakdown	Frequency	Percent
<2 times	12	38.7
2-4 times	11	35.5
5-6 times	8	25.8
Total	31	100.0

Table 7. Fuelling difficulties in a month.

Fuelling difficulty in a month	Frequency	Percent
<2 times	14	45.2
2-4 times	15	48.4
5-6 times	2	6.4
Total	31	100.0

Table 8. Occurrence of accidents in a month.

Occurrence of accidents	Frequency	Percent
<2 times/year	24	77.4
2-4 times/year	7	22.6
Total	31	100.0

Table 9. Long journey time.

Long journey time	Frequency	Percent
Yes	87	70.2
No	37	29.8
Total	124	100.0

Table 10. Frequent stops.

Frequent stops	Frequency	Percent
Yes	105	84.7
No	19	15.3
Total	124	100.0

Occurrence of minor accidents in a month

Table 8 shows that 24 (77.4%) of the drivers experienced minor accidents less than 2 times in a year, while 7 (22.6%) of the respondents experienced minor accidents between 2 to 4 times in a year.

Passengers' challenges

Long journey time

Table 9 shows that 87 (70.2%) experienced long journey time in their travels in the study area while 37 (29.8%) did not.

Frequent stops

From Table 10, the study suggested that, 105 (84.7%) respondents experienced frequent stops before the completion of their journey, while 19 (15.3%) respondents did not experience frequent stops.

Contributions of the passengers' travel characteristics to travel demands in the study area

The study revealed that, the length of trip (travel distance) and waiting time of each respondent made significant contributions to the travel demands of the passengers in the study area. The regression equation is:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_nX_n + c$$

Y=dependent variable (travels pattern measured by weekly travels)

a=constant

X_1, X_n =independent variables (monthly income measured by money; age measured by number of years; passengers' travel time measured in minutes; time of travel measured in minutes; cost of travels measured by money; distance of travels measured in meters; passengers' wait time for cab measured in minutes; distance of travels measured in minutes; purposes of travels measured by education, recreation, work, residence, school) etc.

b_1, b_n =coefficients of independent variables

c=random error term measuring the deviation of the observed trips (Y)

Tables 11 and 12 revealed that the most significant variables that could enhance the travel demands of public transport system in the study area are trip distance and passengers' wait time for cab. The other significant variables had been considered in the excluded variables by the step wise multiple regressions. However, experience

Table 11. Model summary.

Model	R	R ²	Adjusted R ²	Std. error of the estimate
1	0.523(a)	0.273	0.267	0.514
2	0.548(b)	0.301	0.289	0.506

a Predictors: (Constant), length of trip of each respondent; b Predictors: (Constant), length of trip of each respondent, waiting time for cab.

Table 12. Coefficients (a).

Model	Variable	Unstandardized coefficients		Standardized coefficients	t		Sig.
		B	Std. error	Beta	B	Std. error	
1	(Constant)	0.423	0.193		2.193		0.030
	Length of trip of each respondent	0.380	0.056	0.523	6.775		0.000
2	(Constant)	0.219	0.212		1.032		0.304
	Length of trip of each respondent	0.376	0.055	0.516	6.788		0.000
	Waiting time for cab	0.146	0.067	0.165	2.171		0.032

a Dependent variable: travel times per week (n=124).

shows that the income, age and travel costs of passengers cannot be overemphasized in the forecasting of travel patterns.

POLICY STATEMENTS AND CONCLUSION

Policy statements

This paper suggests additional cabs at the motor park, in order to eliminate passengers' unnecessary wait time in the study area. The ticket fees that the drivers pay, as revealed in the section of the study area of this study, should be reduced so as to reduce cost of travels for passengers. There is a need for government policy statement on public transportation at the local level, on passengers' travel demands that will encompass passengers' travel-friendly rules for an efficient system. The time spent on travel could be reduced by continuous maintenance of the road and efficient repair of the vehicles. There is a need for the provision of motor parks at the various activity areas of the study area, in order to distribute the trips that will be generated appropriately and as a response statement to the challenge of frequent stops. The waiting time of the passengers for cabs should be maintained and reduced if possible, through the operators' interventions by their respective associations.

The operators' and passengers' challenges suggest the need for cab test before they start operations and seasonal cab checks by the motor park association. This can also be done after the drivers commence operations in order to avoid break down of vehicles. Adequate

fueling should be done at filling stations closer to the parks in the morning, so as to serve operations for the entire day in order to curb the fueling challenge. Drivers' seminar and education should be inculcated into the programme of the organization in order to prevent accident in the study area. On the point of the passengers, there should be a re-design of Ebute and Igbogbo passengers cabs' routes that will separate both destinations in order to tackle the challenge of long journey time and frequent stops thereby providing a smooth journey for passengers in the study area.


On the inferential analysis, there is a need for a special planning by the transport planners for the travel distance and passengers' waiting time, as they were revealed to be the major contributors to passengers' travel demands. This suggested that, there is a need for route assignments in the study area and the provisions of more cabs in order to reduce the travel length and drastically reduce or eliminate the passengers waiting time.

Conclusion

This paper has investigated the road public transport passengers' travels from Ayangburen Taxi Park, Ikorodu, Lagos, Nigeria and examined its challenges and contributions to the travels demand. The study found that, the average age of passengers was 36 years whose average income was ₦15,000. The travel characteristics of passengers revealed that, average passengers' waiting time for cab was <15 min, the average travel frequency was 8 times per week, the average travel time

was 45 min and the passengers' average travel length was 1500 m. The inferential model revealed that, the temporal length of trip and waiting time ($R^2=30.1\%$) of respondents made significant contributions to the travel demands of the passengers in the study area.

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