

ASSESSMENT OF PATTERN OF INTER-URBAN TRAVELS OF PUBLIC TRANSPORT PASSENGERS IN LAGOS METROPOLIS

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Abstract

This study assessed the pattern of inter-urban travels of public transport passengers in Lagos metropolis. A set of structured questionnaire were administered on 1,483 early morning (6am-8am) inter-urban public transport passengers of the selected 76 inter-urban motor parks of Lagos metropolis. Using multi-stage sampling technique, zones of survey, inter-urban motor parks, vehicle types and occupancy ratio were identified and an average of 7, 14 and 43 passengers were interviewed at each of low, medium and high inter-urban motor parks based on passengers' flow on a Wednesday, Friday and Saturday mornings. Data were analysed using frequency tables, chi square and ANOVA for the interpretations and discussions of results. Majority of respondents' destination was southeast (36.5%) as 56.4% moved through mini buses. The average trip frequency of inter-urban passengers was 1 trip per week while the average last travel time spent was 5 hours. Also, the average inter-urban travel distance was 380 km and the average inter-urban travel cost was N3, 000 per trip. Besides, the major travel purposes of respondents were business and school (52.4%). The study concluded with strategies that can enhance the inter-urban public transport travels in Lagos metropolis. The socio-economic importance of the study is encased in wealth creation, low carbon city regeneration, climate change, and travel demand among others.

Key Words: *Travel Behaviour, Inter-Urban Travels, Public Transport, Passengers, Lagos, Nigeria*

Introduction

Urban planning is the reconciliation of various land uses such as residential, circulation, commercial among others (Oduwaye, 2002). It is also the integration of disciplines of land use planning and transport planning with a view to exploring a wide range of aspects of the built and social environments of urbanized municipalities and communities (Sangowawa, 2009). Efficient and appropriate transportation and telecommunications system are critical to the efficient interaction of activities in an urban

area (Alade, 2009). Transportation systems play a significant role in the development of urban centers and cities all over the world, especially in the area of centrality to effective functioning of cities. For this reason, policy makers and transportation planners are expected to pay greater attention to the development of transport infrastructure in cities. Efficient transportation is a trademark of a developed society and the essence of transportation is the ability to overcome space, so as to achieve certain human aspirations especially, inter-urban mobility

(Alade, 2009). A key aspect of transportation is inter-city movements, which are usually long distance travels between two cities. Its complexity depends on the density of urban centers within the region. In order to travel effectively, every human society, from the most primitive to the most advanced, depends on some forms of telecommunications, which also necessitated the quest for various relevant researches. In a study of cybernetics of travels and telecommunications relationships in metropolitan areas of Nigeria, Ogunkoya (2008) reported a drastic increase in mobile telephone ownership and the respondents agreed that accessibility to mobile telephone reduces the number of intended trips by them. Olaseni (2010) studied the locational analysis of inter-urban motor parks in Lagos and found positive statistically significant variations between the commercial, transition and residential zones of the study area; Fadare (2010) revealed that the use of telecommunications is a natural substitute for transportation, It is as a matter of resultant outcome rather than initial intent that telecommunications frequently substitute for transportation.

James (2012) investigated problematic use of mobile phones: measuring the behaviour, its motivational mechanism and negative consequences using self-report questionnaire to administer the item pool to a developmental sample and found a distinction between actual behaviour, its outcome and motivations while Agunloye (2013) examined the influence of mobile phone calls on travel pattern of airline transport passengers in Murtala Mohammed Airport Two (MMA2) Lagos, Nigeria using survey research method and found that there was a positive significant relationship between mobile phone calls and travel frequency in the study area. Based on the aforementioned, the pattern of inter-urban travels of public transport passengers needs to be well understood as this study examines

the pattern of inter-urban travels of public transport passengers who travel from inter-urban motor parks of Lagos metropolis to other parts of Nigeria.

The Study Area

The study area is Lagos metropolis where 85% of Lagos state population resides. The geographical dimension establishes that Lagos is located in Lagos State (Southwest Nigeria). The inter-urban motor parks are in the major sixteen (16) local government areas that make up metropolitan Lagos and these are; Agege (with 562 early morning travellers), Ajeromi-Ifelodun (with 179 early morning travellers), Alimosho (with 832 early morning travellers), Amowo-Odofin (with 3,933 early morning travellers), Apapa (with 310 early morning travellers), Eti-Osa (with 254 early morning travellers), Ifako-Ijaiye (with 60 early morning travellers), Ikeja (with 186 early morning travellers), Kosofe (with 1,446 early morning travellers), Lagos-Island (with 328 early morning travellers), Lagos Mainland (with 2318 early morning travellers), Mushin (with 204 early morning travellers), Ojo (with 2443 early morning travellers), Oshodi-Isolo (with 1,900 early morning travellers), Shomolu (with 2813 early morning travellers) and Surulere (with 806 early morning travellers).

Methodology

Data on pattern of travel behaviour of inter-urban public transport passengers in Lagos, Nigeria were majorly sourced from questionnaire administration. The sample frame of the study was 8,021 early morning (6am-8am) inter-urban public transport passengers of the selected 76 inter-urban motor parks of Lagos metropolis while the sample size translated to 20.5% based on Cochran's sample size formula. However, the successfully completed and returned questionnaires that were used for the analysis was 18.5% (1,483 questionnaires) for the final analysis of the study. The content and

construct validity of measurement were used. The multi-stage sampling technique was used for the study because of the nature of waiting passengers' at the inter-urban motor parks. The sampling procedure for this study firstly encompassed the identification of the zones of survey, secondly, identification of the entire inter-urban motor parks in each of the zones. Thirdly, identification of average number of vehicles in each carrying capacity (low 76 vehicles; medium 99 vehicles and high 121 vehicles) generating the aforementioned average number of early morning inter-urban passengers. Finally, an average of 7, 14 and 43 passengers were interviewed at each of low, medium and high inter-urban motor parks on Wednesday, Friday and Saturday mornings. The choice of these days was in accordance with the works of Olaseni (2010) and Author's pilot survey (2011).

The reliability of instrument used was confirmed by Cronbach's Alpha reliability statistical tool, using the Split Half Method. Frequency tables, chi square (for significant difference in respondents' travel pattern) and ANOVA (for significant variation in respondents' travel pattern) were used for data analysis through the SPSS data analyses software programme.

Results and Discussion

The variables of patterns of inter-urban travels include trip destination, trip mode, travel frequency, travel time, travel distance, travel cost, travel purpose and major travel

reasons respectively. The chi-square was used to analyse the significant differences that exist between respondents' patterns of inter-urban mobility and inter-urban travel distances while the One-Way ANOVA was used to analyse the significant variations between the inter-urban mobility continuous variables and inter-urban travel distances in the study area. Besides, the analysis flows from the entire inter-urban passengers of Lagos metropolis and moves to the various inter-urban motor parks (high, medium and low). The grouping of inter-urban passengers into low, medium and high classes represents inter-urban motor parks with <50, 51-100 and >100 early morning passengers. This classification justifies the variance in passengers' flow from each of the inter-urban motor parks of Lagos metropolis as it also present a comprehensive and logical analysis of inter-urban travellers in each class of the entire study area.

Passengers' Inter-Urban Trip Destination

Results in Table 1 shows that passengers' group destinations were southwest (20.1%), southeast (36.5%), southsouth (13.1%), northeast (10.2%), northwest (7.2%) and north central (12.9%) respectively in the study area. Using the chi-square statistics, the study found that there is statistical significant differences in respondents' inter-urban trip destinations in inter-urban motor parks of Lagos metropolis ($X^2 = 203.163$, $p < 0.05$).

Table 1: Passengers' Inter-Urban Trip Destination

Group destinations	High Capacity Motor Parks		Medium Capacity Motor Parks		Low Capacity Motor Parks		Totals	
	Freq.	percent	Freq.	percent	Freq.	percent	Freq.	%
Southwest	127	14.0	118	33.4	53	24.0	298	20.1
Southeast	389	42.8	97	27.5	54	24.0	540	36.5
South South	105	11.6	50	14.2	39	17.6	194	13.1
Northeast	105	11.6	34	9.6	13	5.9	152	10.2
Northwest	75	8.3	14	4.0	18	8.1	107	7.2
North Central	108	11.9	40	11.3	44	19.9	192	12.9
Totals	909	100	353	100	221	100	1,483	100

Inter-Urban Passengers' Travel Modes

As shown in Table 2, the study showed that respondents' travel modes in the different motor parks were mini bus (56.4%), large bus (37.6%), saloon/taxi (3.2%) and others were (2.8%). Using the chi-square statistics, the study found that there is statistical significant differences in respondents' travel modes in inter- urban motor parks of Lagos metropolis ($X^2=1248.374$, $p<0.05$).

Table 2: Inter-Urban Passengers' Travel Modes

Travels' modes	High Capacity Motor Parks		Medium Capacity Motor Parks		Low Capacity Motor Parks		Totals	
	Freq.	percent	Freq.	percent	Freq.	percent	Freq.	%
Mini bus	446	49.1	250	70.8	139	62.9	835	56.4
Large bus (conventional)	430	47.3	74	21.0	54	24.4	558	37.6
Saloon/taxi	17	1.9	17	4.8	14	6.3	48	3.2
Others	16	1.8	12	3.4	14	6.3	42	2.8
Totals	909	100	353	100	221	100	1,483	100

Passengers' Inter-Urban Trip Frequency in the Past 1 Month

As shown in Table 3, the study revealed that respondents' inter-urban trip frequency were none (22.5%), < 1.5 times (61.8%), 2-3 times (8.8%), 3-4 times (2.2%), 5-6 times (0.3%), 6-7 times (0.7%), >8 times (3.7%) in the past 1 week from different motor parks of Lagos metropolis. The study revealed that the average trip frequency in the past 1 month from different motor parks is 3 times. Using the one way ANOVA, there are statistical significant variations in the duration of stay of respondents in inter-urban motor parks of Lagos metropolis ($F=21.925$, $p<0.05$) (see Table 4).

Table 3: Passengers' Inter-Urban Trip Frequency in the Past 1 Month

Travel frequencies	High Capacity Motor Parks		Medium Capacity Motor Parks		Low Capacity Motor Parks		Totals	
	Freq.	percent	Freq.	percent	Freq.	percent	Freq.	%
none	154	16.9	98	27.8	82	37.1	334	22.5
< 6 times	638	70.2	178	50.4	100	45.2	916	61.8
6-10 times	68	7.5	47	13.3	16	-	131	8.8
11-15 times	22	2.4	11	3.1	-	-	33	2.2
15 -20 times	5	0.6	-	-	-	-	5	0.3
21-25 times	4	0.4	4	1.1	1	0.5	9	0.7
above 25 times	18	2.0	15	4.2	22	10	55	3.7
Totals	909	100	353	100	221	100	1,483	100

Table 4: ANOVA, Testing the Variation in Respondents' Inter-Urban Travel Frequency in the Past 1 Month

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	147.645	5	29.529	21.925	.000
Within Groups	1989.268	1477	1.347		
Total	2136.913	1482			

Passengers' last travel times

As shown in Table 5, respondents' last travel times were none (7.5%), <3 hrs (13.2%), 3-6 hrs (34.5%), 7-10 hrs (26.8%), 11-14 hrs (13.3%) and > 14 hrs (4.7%) respectively. The study revealed that the average last travel time spent across the three carrying capacities was 4.5 hours. Using the one way ANOVA, there are statistical significant variations in the respondents' last travel times in different motor parks in the three carrying capacities of Lagos metropolis (F=14.533, p>0.05) (see Table 6).

Table 5: Passengers' last travel times

Travel times	High Capacity Motor Parks		Medium Capacity Motor Parks		Low Capacity Motor Parks		Totals	
	Freq.	percent	Freq.	percent	Freq.	percent	Freq.	%
none	47	5.2	31	8.8	33	14.9	111	7.5
<3 hrs	105	11.6	52	14.7	38	17.2	195	13.2
3-6 hrs	311	34.2	148	41.9	53	24.0	512	34.5
7-10 hrs	274	30.1	68	19.3	56	25.3	398	26.8
11-14 hrs	133	14.6	32	9.1	32	14.5	197	13.3
above 14 hrs	39	4.3	22	6.2	9	4.1	70	4.7
Totals	909	100	353	100	221	100	1,483	100

Table 6: ANOVA, Testing the Variation in Respondents' last travel times

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	124.070	6	20.678	14.533	.000
Within Groups	2100.164	1476	1.423		
Total	2224.235	1482			

Inter-urban Travel Distance

Results as shown in Table 7, revealed that respondents' inter-urban travel distances were none (7.5%), <250km (13.9%), 250km-500km (42.3%), 500km-750km (21%%) and >750km (15.3%) respectively. The study revealed that the average inter-urban travel distances in different motor parks of Lagos metropolis was 380 km. Also, there are statistical significant variations in the respondents' inter-urban travel distances in different motor parks in the three carrying capacities of Lagos metropolis using the one way ANOVA (F=9.056, p>0.05) (see Table 8).

Table 7: Inter-Urban Travel Distance

Travel distances	High Capacity Motor Parks		Medium Capacity Motor Parks		Low Capacity Motor Parks		Totals	
	Freq.	percent	Freq.	percent	Freq.	percent	Freq.	%
none	47	5.2	31	8.8	33	14.9	111	7.5
<250 km	95	10.5	78	22.1	33	14.9	206	13.9
250km-500km	449	49.4	127	36.0	52	23.5	628	42.3
500km-750km	186	20.5	56	15.9	70	31.7	312	21.0
> 750km	132	14.5	61	17.3	33	14.9	226	15.3
Totals	909	100	353	100	221	100	1,483	100

Table 8: ANOVA, Testing the Variation in Respondents' Inter-Urban Travel Distance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	63.551	6	10.592	9.056	.000
Within Groups	1726.322	1476	1.170		
Total	1789.873	1482			

Passengers' Travel Cost

Results in Table 9 showed that, respondents' inter-urban travel costs (fare) were none 111 (7.5%), <N2, 000 (15%), N2000-N4000 (42.3%), 4001-6000 (22.9%), 6001-8000 (7.2%), 8001-10,000 (3.3%), 10,001-12,001 (0.3%), 12,001-14,000 (0.3%), above 14,000 (1.2%) respectively in the last 1 week. The study revealed that the average inter-urban travel cost in different motor parks of Lagos metropolis is N3, 000. Also, there are statistical significant variations in the respondents' travels costs (fare) in different motor parks in the three carrying capacities of Lagos metropolis using the one way ANOVA (F=17.057, p>0.05) (see Table 10).

Table 9: Passengers' Travel Cost

Travel costs	High Capacity Motor Parks		Medium Capacity Motor Parks		Low Capacity Motor Parks		Totals	
	Freq.	percent	Freq.	percent	Freq.	percent	Freq.	%
none	47	5.2	31	8.8	33	14.9	111	7.5
<N2,000	87	9.6	97	27.5	39	17.6	223	15.0
N2000-N4000	420	46.2	125	35.4	81	36.7	626	42.3
4001-6000	237	26.1	64	18.1	38	17.2	339	22.9
6001-8000	65	7.2	22	6.2	20	9.0	107	7.2
8001-10,000	41	4.5	8	2.3	-	-	49	3.3
10,001-12,001	3	0.3	1	0.3	1	0.5	5	0.3
12,001-14,000	4	0.4	1	0.3	-	-	5	0.3
above 14,000	5	0.6	4	1.1	9	4.1	18	1.2
Totals	909	100	353	100	221	100	1,483	100

Table 10: ANOVA, Testing the Variation in Respondents' Travel Cost

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	169.607	6	28.268	17.057	.000
Within Groups	2446.145	1476	1.657		
Total	2615.752	1482			

Passengers' Inter Urban Trip Purpose

As shown in Table 11, the study revealed that respondents' inter-urban travel purposes were none (7.5%), business (37.3%), school (15.1%), work (11.9%), leisure and recreation (11.2%) while others are (17%) in the study area. Using the chi-square inferential statistics, the study found that there is statistical significant differences in respondents' travel purposes in inter-urban motor parks of Lagos metropolis ($X^2 = 502.280$, $p < 0.05$).

Table 11: passengers' Inter Urban Trip Purpose

Travel purposes	High Capacity Motor Parks		Medium Capacity Motor Parks		Low Capacity Motor Parks		Totals	
	Freq.	percent	Freq.	percent	Freq.	percent	Freq.	%
None	47	5.2	31	8.8	33	14.9	111	7.5
Business	388	42.7	117	33.1	48	21.7	553	37.3
School	117	12.9	75	21.2	32	14.5	224	15.1
Work	99	10.9	54	15.3	24	10.9	177	11.9
Leisure and Recreation	107	11.9	27	7.6	32	14.5	166	11.2
Others	151	16.6	49	13.9	52	23.5	252	17.0
Totals	909	100	353	100	221	100	1,483	100

Major Reason for Travelling Instead of Using Phone(s)

As shown in Table 12, the study revealed that respondents' major reasons for travelling instead of using phones in the study area were bad network (2.9%), personal interaction (84.8%), loss of phone calls (3.6%) while cost of calls was (8.7%) respectively. Using the chi-square statistics, the study found that there is statistical significant differences in respondents' major reason for travelling instead of using phones in inter-urban motor parks of Lagos metropolis ($X^2 = 2836.501, p < 0.05$).

Table 12: Major Reason for Travelling Instead of Using Phone(s)

Major reasons	High Capacity Motor Parks		Medium Capacity Motor Parks		Low Capacity Motor Parks		Totals	
	Freq.	percent	Freq.	percent	Freq.	percent	Freq.	%
Bad network	16	1.8	22	6.2	5	2.3	43	2.9
Personal interaction	746	82.1	301	85.3	210	95.0	1,257	84.8
Loss of phone calls	31	3.4	22	6.2	1	0.5	54	3.6
Cost of calls	116	12.8	8	2.3	5	2.3	129	8.7
Totals	909	100	353	100	221	100	1,483	100

Recommendations and Conclusion

Based on the findings of patterns of inter-urban travels of passengers in Lagos Metropolis, this study recommends that, businesses, schools and works that are major travel purposes should be scientifically distributed by experts to other parts of the country with a view to having a proportional passengers' inter-urban trip destinations other than the revealed in the study. There is a need for the integration of a policy to encourage more large Buses as the conventional mode of inter-urban passengers' travels into the national transport policy. This should be done in an attractive manner

so that the passengers on other modes will be attracted with a view to reducing pollution, traffic congestion and travel costs on the roads. The reliance of most inter-urban passengers in Lagos metropolis on road mode of transport makes urban transport system in Nigeria to be grossly inadequate and inefficient. However, multimodal system is being advocated in this study. The findings further suggested that the travel costs should be subsidized by the federal government for the passengers. There is a need for the investigations of precise businesses of inter-urban passengers in Lagos Metropolis by the Federal government relevant agencies with a

view to reducing road traffic accidents and congestion. Personal interactions of inter-urban passengers should be enhanced by the introduction of advance telecommunication services by telecommunications providers. This should include e-shopping, tele-physical discussions as recently introduced by some mobile phones services providers.

This study has investigated the travel demands of inter-urban public transport passengers in Lagos metropolis and found that there is statistical significant differences in respondents' inter-urban trip destinations in inter-urban motor parks of Lagos metropolis ($X^2 = 203.163$, $p < 0.05$). Using the chi-square statistics, the study found that there is statistical significant differences in respondents' travel modes in inter-urban motor parks of Lagos metropolis ($X^2 = 1248.374$, $p < 0.05$). The study revealed that the average trip frequency in the past 1 month from different motor parks is 3 times. Using the one way ANOVA, there are statistical significant variations in the duration of stay of respondents in inter-urban motor parks of Lagos metropolis ($F = 21.925$, $p < 0.05$). Using the one way ANOVA, there are statistical significant variations in the respondents' last travel times in different motor parks in the three carrying capacities of Lagos metropolis ($F = 14.533$, $p > 0.05$). The study revealed that the average inter-urban travel distances in different motor parks of Lagos metropolis was 380 km. Also, there are statistical significant variations in the respondents' inter-urban travel distances in different motor parks in the three carrying capacities of Lagos metropolis using the one way ANOVA ($F = 9.056$, $p > 0.05$). The study revealed that the average inter-urban travel cost in different motor parks of Lagos metropolis is N3, 000. Also, there are statistical significant variations in the respondents' travels costs (fare) in different motor parks in the three carrying capacities of Lagos metropolis using the one way

ANOVA ($F = 17.057$, $p > 0.05$). Using the chi-square inferential statistics, the study found that there is statistical significant differences in respondents' travel purposes in inter-urban motor parks of Lagos metropolis ($X^2 = 502.280$, $p < 0.05$). Using the chi-square statistics, the study found that there is statistical significant differences in respondents' major reason for travelling instead of using phones in inter-urban motor parks of Lagos metropolis ($X^2 = 2836.501$, $p < 0.05$).

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