

The Quality Of Mass Transit Service In Abuja, Nigeria: An Analysis Of Customers Opinions.

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ABSTRACT: This study examines Abuja Urban Mass Transport Company (AUMTCO) and Nationwide Unity Transport Company's (NUTCO) service efficiency, passengers' perspectives and bus route deficiencies. The aim is to evaluate urban mass transit systems in Abuja and its transport problems of equitable bus service distribution to the masses in Abuja, Nigeria. The research uses efficiency indicators to evaluate the overall efficiency of the transport system quality in Abuja. It is observed that the current efficiency of the organized bus transit operators in Abuja is poor. There are service deficiencies in the areas of passengers' volume, vehicle kilometers and revenue generation, although the system is overstretched for the current fiscal and financial capacity, at the cost of quality. Structured questionnaires and past literature were used as sources of data. The primary data included road networks, number of trips per day by operators, operating speed, and purpose of travel, passengers' security, vehicle speed, and waiting time. The study was conducted by using two questionnaires: one for the operators and the other for tricycle users. The total number of completed questionnaires for the survey was 350 for users. The sampling technique used was random sampling from several zones of the study area. Data were analyzed using percentage and Chi-square statistical techniques for testing the hypotheses. The researcher observed that the operators of urban mass transit in the study area were operating at average of 6 trips per day. 43.49% of the respondents responded that they wait more than 15 minutes at the bus stops. The hypothesis test was used to study people's feelings about the attributes of the service provided for urban mass transit users, such as affordability, regularity, maintenance of arrival and departure time, comfort and safety. It was found that there are significant differences at the 5% level between the various categories of these respondents.

Index Terms: Urban-mass transit, efficiency, transport, and spatial analysis.

1 INTRODUCTION

Assessing and improving quality of service in the urban mass transit holds a high priority for the majority of public transport operators. Furthermore, urban transport operators are forced to place particular emphasis on the monitoring and improvement of the service quality provided in an attempt to address the increasing rate of automobile ownership and the high rate of traffic congestion in the environment, and how to move the sustainability of urban transport system to a high extent (see [15]). The TRB Transit Capacity and Quality of Service Manual [13], the TRB Handbook for Measuring Customer Satisfaction and Service Quality [12], and the EC-CEN Transportation Logistics and Science measures customer of service satisfaction and quality of service.

Targeting and Measurement [3] are some of the manuals produced for measuring public transit quality. Transport contributes to pro –poor policy by providing access to opportunities, and enhancements to security (through reduced isolation), as well as providing job opportunities in the sector [16]. Urban transport has to do with mobility in an urban area. Such mobility has to be planned in such a way that it will bring about a balance in the inter-relation between city structure and supply of transportation services. It takes a relatively minor accumulation of automobiles to occupy the city streets to the extent that the average operating speed of all vehicles would come to almost that of the bicycle. The unavoidable slowdown of traffic and traffic jams are the consequences of the enormous demand for necessary streets space. The private automobile requires many times more streets routes for each carried person when compared to that required for a bus. If this trend is allowed to continue, we shall get to a stage where movement in the city will come to a near-halt (see [9]). The urban transport sector, however, have many problems in most developing countries. Inadequate and poor quality infrastructure, mismatch between demand and supply, and increased rate of accidents are some of the problems. These problems are triggered by interrelated trends such as urban population growth and (unplanned and uncoordinated) development of cities [11]. The term “urban mass transit” generally refers to scheduled intra-city service on a fixed route in shared vehicle. Even this definition embraces horse –drawn Omnibus and streetcars, cable cars, trolley coaches, gasoline and diesel buses, underground and above ground rail rapid transit, ferries, and some commuter rail services. It also comprises a spectrum of modes of urban public transport that use specific fixed-track or exclusive and common – user road track (such as metros, suburban railways, light rail transit, and buses). Mass transit usually has superior operating capacity and performance compared with unsegregated road–based public transport (such as buses, taxis and Para transit) [18]. Furthermore, the rate of migration of people and automobile from the nearby states to the Federal capital Territory Abuja is so high that in future the

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population of both people and automobile will be double what it is now. Already there is problem of congestion during the peak period in some of the streets that leads to most of the suburban areas such as AYA, Kubwa area, Dei-Dei junction etc. the only way to solve this problem of congestion and movement of people to various area of their desirable to travel is to have an efficient urban mass transit such as the rail transit, Bus Rapid Transit and others. This will help to increase demand for public transport in all these suburban areas. With an organized mass transit in a city like Abuja which is the Capital territory of Nigeria, this urban mass transit is going to act as a catalyst in the economic development of the country since we know that transport is the life wire of any country in terms of development [9]. For quality of service of the urban mass transit to be increased, there must be a very good measurement of the quality of service of the operators operating in a certain environment, with a feedback method through the customers using those particular urban mass transit vehicles. From the feedback result, the conclusion of the quality of service can now be drawn.

Objectives of the Study

The aim of the study is to evaluate urban mass transit service in Abuja and its impact on the transport problem and make recommendations on possible improvements on the operations and networks. In order to achieve the stated aim, the study has the following objectives:

- 1) To identify the problems of urban transportation in the study area.
- 2) To identify the constraints of the urban mass transit operators in the study area.
- 3) To identify the height of urban mass transit needs of the people in the study area.
- 4) To identify the level of urban mass transit operators involvement in the urban transportation in the study area.
- 5) To discuss the level of service of the existing urban mass transit bus services and to analyze the coverage of the current bus service in space and time.
- 6) To assess the quality of the service rendered.
- 7) To suggest improvements to the bus service.

Research Questions

- 1) What parameters can be used in measuring efficiency of urban mass transit system?
- 2) Which parameters are used by Abuja urban mass transit bus operators?
- 3) How can these parameters be combined to measure overall efficiency?
- 4) How does the Abuja urban mass transport policy address these parameters?
- 5) How are Abuja Urban Mass Transit agencies performing under the current situation of service?
- 6) How the service is spatially distributed?
- 7) What are the variability and problems of the service?
- 8) Are there capacity constraints?
- 9) How much capacity is needed to satisfy the demand/

- 10) What policy option can improve the quality of service in terms of capacity, bus stops, bus lanes and transfer points?

Hypotheses

- 1) H_0 : There is no significant difference between the various categories of respondents in their views about the regularity of the service.
 H_1 : There is significant difference between the various categories of respondents in their views about the regularity of the service.
- 2) H_0 : There is no significant difference between the various categories of respondents in their views about the affordability of the service.
 H_1 : There is a significant difference between the various categories of respondents in their view about affordability of the service.
- 3) H_0 : There is no significant difference between the various categories of respondents in their views about the service comfortability.
 H_1 : there is significant difference between the various categories of respondents in their views about service comfortability.
- 4) H_0 : There is no significant difference between the various categories of respondents in their views about safety of service.
 H_1 : There is significant difference between the various categories of respondents in their views about safety of service.
- 5) H_0 : There is no significant difference between the various categories of respondents in their views about maintenance of arrival time and departure time.
 H_1 : There is significant difference between the various categories of respondents in their views about maintenance of arrival time and departure time.

SIGNIFICANCE OF THE STUDY

With this study, the researcher believes that the results and recommendation from this study will go a long way to help the government on how to handle urban transport problems and as well ignite them on how to improve the transport infrastructures, maintenance of the existing and developing the new infrastructure and other mass transit schemes such as Lagos State BRT and other Bus Rapid Transit (BRT) and Rail Rapid transit (RRT) in countries such as Brazil, South Africa, and United States of America so that with the help of this study, the government can improve their transport system which is needed for greater economic development of the area and of the country

STUDY AREA AND ROUTE MAP

[Place Figure 1 Here]

[Place Figure 2 Here]

Abuja is the Federal Capital Territory of Nigeria. The territory is located just north of the confluence of the River Niger and Benue River. It is bordered by the states of Niger to the west and north, Kaduna to the northeast, Nasarawa to the east and south, and Kogi to the southwest. On the map, Abuja is located at 8.50 N 7.10/ 8.833 N 7.167 E. It is geographically located in the center of the country. The Federal Capital territory has a landmass of approximately 7,315km, of which the actual city occupies 275.3km. It is situated within the savannah region with moderate climatic conditions. At the 2006 census, the city of Abuja had a population of 776298 [19] making it one of the top ten most populous cities in Nigeria. However, Abuja has witnessed a huge influx of people into the city which has led to the emergence of satellite towns such as Karu urban Area, Suleja Urban Area, Gwagwalada, Lugbe, Kuje and smaller settlements to which the planned city is sprawling to towards, the unofficial metropolitan area of Abuja is well over three million. The Abuja density is about 190/km with GDP of \$5.01billion in 2007 and per capita of \$3,285 [20] Bus route is defined as the infrastructure provided on a fixed alignment by buses operating on a predetermined schedule [17]. The bus routes in Abuja are both radial and tangential. Most routes are radial, which operates from the three main zones namely Northern Zone, Central Zone and Southern Zone, some routes across the city centre between one outer suburb and another. Most of the routes are along the three main roads which run from North to Central, South to Central part. As the demand for public transport increased driven by the rapid population growth and uncontrolled horizontal expansion of the city, more routes are opened due to expansion of the city, and expansions of the existing routes (complemented by new vehicle injection) to cater for the demand following the existing road network.

URBAN MASS TRANSPORT AND QUALITY OF SERVICE

The goal of transport research should not be limited to theoretical analysis but should include the development of practical tools that may improve the quality of peoples' mobility and their daily life. The improvement of urban mass transport services through efficient service-quality management and benchmarking can be considered a big step towards achieving such a goal. Although quality monitoring and benchmarking of public transport services are two methods implemented largely in some European Union (EU) countries and North America, they are rather new to public transport systems of many countries such as Greece. In these countries, research is crucial to facilitate widespread use of quality monitoring and benchmarking by public transport operators in their daily work [7]. From the customer's opinion, quality is relative and depends upon the objectives, means and results. Benchmarking, on the other hand, is a dynamic comparison based on the idea of improvement and action. Both benchmarking and quality improvement are used in public transport systems. More particularly, a way to improve public transport quality using benchmarking is to identify customers' priorities and needs, measure customers' satisfaction using appropriate indices,

use this feedback to evaluate relevant service parameters, and finally take measures to improve services provided to the customers [7]. (See [5]) express their research on an investigation concerning their influencing emotion on daily commuting experiences. The results from the survey conducted revealed that commuting by car as well as by public transport can be stressful because of delays caused by the traffic volume or congestion in the city. Public transport was perceived as unpleasant and public transport users expressed a more negative attitude toward their daily commute. The negative attitudes were shown to be related to stress as well as boredom caused by delays and waiting time at the bus stop. Furthermore they suggested that public transport is stressful due to unpredictability and longer travel times. Such study recognizes some sources of pleasure for urban mass transport users. Attributes relating to pleasurable opinions of urban mass transport users were expressed. A transnational comparison of customers' public transport perceived service satisfaction in eight cities (Stockholm, Barcelona, Copenhagen, Geneva, Helsinki, Vienna, Berlin, Manchester and Oslo) in Europe. The result showed four general factors system such as traffic supply, reliability and information; bus and bus stop design that makes customer comfortable and enjoy the travel experience; staff skill, knowledge and attitude toward customer; and safety not only both in the bus and bus stop but also safe from traffic accident. They further concluded that differences in public transport technology and infrastructure may cause differences in individual item loadings [4]. The advantages of using public transport or urban mass transit according to Portugal public transport users result highlights the importance of a cost friendly and less stressful public transport service. It is perceived as less stressful since there is no need to drive, it is possible to relax and one may be able to rest or read. Travel time on exclusive bus lanes is considered faster than the car, there is less exhaust emissions and there are opportunities to talk to fellow passenger while travelling [2]. A depth interview conducted in Porto shows dissatisfying factors in the urban mass transport or public transport. From the interview, customers reported waste of time, too crowded, lack of comfort, time uncertainty, lack of control, unreliability, long waiting times, need to transfer, they cannot change route to avoid traffic congestion, lack of flexibility, and long walking time. The knowledge from these research shows that public transport is still an alternative as a travel mode of choice for many people. In order to keep current passenger, urban mass transport has to improve the service to accommodate wide range of customer need and expectation (see [2]; [1]). The high rate of urbanization in the major urban cities of Nigeria need an improved transport system to help solve the transportation problem in study area due to the low level income of the masses and the low level of the country's economy which have a great impact on the quality of urban mass transport and in general transport systems commonly used by the citizen. Generally, looking at higher income level, you will find out that any country with higher income level will have an increased households travel demand and as well as the quality of service of the urban mass transport they can desire. On the other hand, quality of service depends to a great extent, on the operating decisions made by the managers of a transit system given their budget constraints, the level of service to be provided, the

characteristics of the areas to be served, and others. In this context, quality of service can also represent and measure how successful an agency is in meeting customer demands, i.e., customer satisfaction. Customer satisfaction is the overall level of attainment of a customer's expectations. It is measured as the percentage of customer expectations which has actually been fulfilled [7]. Furthermore, a model of the customer satisfaction service quality relationship is the satisfier dissatisfier approach [10]. The researcher also combines two research streams, Parasuraman's zone of tolerance and Herzberg's two-factor theories. The zone of tolerance theory states that there are two threshold levels (acceptable level and desired level) where the relationship between satisfaction and quality adjust. The two-factor theory uses qualitative data to determine the presence of quality attributes: if present they create satisfaction; if absent they create dissatisfaction. Pollack's research finds empirical evidence that there are three distinct patterns of the quality satisfaction relationship (satisfier, dissatisfier and critical). The satisfier relationship is initially horizontal and positive linear after an inflection point (threshold). Conversely, the dissatisfier relationship begins positive linear then after a threshold becomes horizontal indicating no relationship. Lastly criticals are positive linear with no inflection point. This concept of attribute type is echoed (see [6], and [8]), who have different terms for these asymmetrical and nonlinear attributes but agree that certain attributes behave differently than linear. Kondo calls for the satisfaction and maintaining attribute on customers' service to be quality attribute while Matzler coins it as a basic factor, the Satisfaction Enhancing attribute is an attractive quality aspect for Kondo and an excitement factor in Matzler's research. Additionally, Matzler identifies a third attribute type that follows a linear symmetric approximation of the satisfaction performance relationship which he calls performance factor.

METHODOLOGY

Different parameters can be used to measure the level of service of a given urban mass transport system. Abuja urban mass transit agencies record data on passenger volume, vehicle-kilometers and revenue monthly, to monitor the performance of routes, vehicles and the system in general. Data used for this study were obtained through primary (structured questionnaires) and secondary (past literature) sources. The primary data collected covered operations of the urban mass transit system (routes, travel cost, number of vehicles, number of vehicles operating per day), travel characteristics of passengers (travel time, travel cost, travel purpose, waiting time, safety of service, regularity of service and so on) and the operators' and passengers' challenges (operating cost, traffic congestion on most routes, non existence of bus lane, travelling time, operating speed). The study adopted the total number of passengers in each buses for a single trip on a particular day as the sample frame. The average capacities of a conventional bus in operation of the mass transit on these routes are eighty passengers. A random sample of respondents was selected from several places in Abuja where the *urban mass transit* drivers usually have bus stops, such as hospitals, markets, schools, residential areas, terminals and road intersections in the three main zone of the routes (Northern route, Southern route and

Central route). The survey was conducted for about six months in the year 2008. The total numbers of respondents used in this survey were 350 *urban mass transit* users and oral interview for the drivers and operators. Data were analyzed through percentage and Chi-square statistical techniques for testing the hypotheses.

DATA ANALYSIS

Vehicle Operation and Revenue

The current fleet size of the two companies' Nationwide Unity Transport Company and Abuja Urban Mass Transport Company are 128 and 195 respectively. They have active fleets of 90 buses and 148 buses while the rest were under maintenance as at the year 2008. Most of the buses were 2 to 5 years old. It was estimated by the companies that at least 400 buses are required to give sufficient coverage for Abuja to satisfy the demand. So the current fleet size is not enough for the study area. Therefore, vehicles are overloaded. The current fleet size of the two companies' Nationwide Unity Transport Company and Abuja Urban Mass Transport Company are 128 and 195 respectively. Its active fleets are 90 and 148 buses respectively and the rest are under-maintenance as at the year 2008. Most of the buses are 2 to 5 years old. It was estimated by the company that at least 400 buses are required to give sufficient coverage for Abuja to satisfy the demand. But the current fleet size of the bus is not enough for the study area. So, most vehicles are overloaded. Summary of annual operational preparation for 45 Marcpolo buses of Abuja Urban Mass Transport Company given in the table below:

[Place Table 1 Here]

Vehicle Distribution and Trend Data.

During the fieldwork secondary data were collected from Abuja Urban Mass Transport Company record and calculated by the researcher. The table below shows the trend of Abuja Urban Mass Transport Company and Nationwide Unity Transport Company bus dispatch and respective service offered and revenue, passenger volume, vehicle kilometer, etc recorded by the company from 1998 to 2008.

[Place Table 2 and Table 3 Here]

The trend for this indicator since the year 1998 to 2008 is shown below:

[Place Figure 3 Here]

The above figure shows how bus hour and passenger volume decreased from the year 1998 to 2005, increased in the year 2006, decreased in 2007 and finally increased in 2008. This decrease was as a result of aging of buses, break down and lack of maintenance. The effect of the variation on the number of dispatched buses is directly reflected on the vehicle kilometers and passenger volume, and vehicle kilometer reduced in the year from 2007 to 2008. Also a lot of fluctuations happened in revenue generation. In terms of passenger's volume, there was much decrease from year 1999 to 2005 and started rising

again from 2006 to 2008; this is also applicable to vehicle kilometer.

[Place Figure 4 Here]

The above figure shows the trend for dispatched buses and bus hour decreasing from 2006 to 2008 as the result of aging buses, lack of maintenance and breakdown of vehicles. In terms of passenger volume, vehicle kilometer and revenue, there was an increase from year 2006 to year 2007, and then the figure started decreasing. This is due to lack of good management and maintenance culture in the transport sector or industry. In conclusion for both companies, there was low maintenance of vehicles and service operations.

Test of hypothesis on the regularity of the service

the respondents' report and the expected frequency of the regularity of the service.

[Place Table 4 Here]

$$\begin{aligned} \text{Degree of freedom} &= (3-1)(2-1) = 2 \\ X^2_{\text{cal}} &= \frac{(63-71.45)^2}{71.45} + \frac{(41-32.55)^2}{32.55} + \frac{(62-54.96)^2}{54.96} \\ &+ \frac{(18-25.04)^2}{25.04} + \frac{(44-42.59)^2}{42.59} + \frac{(18-19.41)^2}{19.41} \\ &= 0.99+2.194+0.902+1.1979+0.047+ 0.047 + 0.102 \\ &= 6.223 \\ X^2_{\text{cal}} &= 6.223 \end{aligned}$$

Interpretation: Since X^2 for $df = 2$ and 5% significance level = 5.991, but $6.223 > 5.991$ H_0 is rejected and H_1 is accepted. This means that there is a significant difference between the various categories of respondents in their views about the regularity of the service.

Test of hypothesis on the affordability of service

Table 5 describes the respondents' report and the expected frequency of the affordability of service.

[Place Table 5 Here]

$$\begin{aligned} \text{Degree of freedom} &= (3-1)(2-1) \\ &= 2 \\ X^2_{\text{cal}} &= \frac{(103-101.69)^2}{101.69} + \frac{(14-15.31)^2}{15.31} + \frac{(94-121.26)^2}{121.26} \\ &+ \frac{(13-13.74)^2}{13.74} + \frac{(62-66.06)^2}{66.06} + \frac{(14-9.94)^2}{9.94} \\ &= 0.017+0.112+6.128+0.040+0.250+0.250+1.658 \\ &= 8.205 \\ X^2_{\text{cal}} &= 8.205 \end{aligned}$$

Since X^2 for $d.f = 2$, and 5% significance level = 5.991,

Interpretation: Since $X^2_{\text{cal}} = 8.205 > X^2$ for $d.f = 2 = 5.991$, Therefore; H_0 is rejected and H_1 is accepted. This means that there is a significant difference between the various categories of respondents in their views about the affordability of the service.

Test of hypothesis on the comfortability of the service

Table 6 describes the respondents' report and the expected frequency of the comfortability of service.

[Place Table 6 Here]

$$\begin{aligned} X^2 &= \sum_{i=1}^k \left(\frac{o - e}{e} \right)^2 \\ \text{Degree of freedom} &= (4-1)(2-1) = 3 \\ X^2_{\text{cal}} &= \frac{(83-92.55)^2}{92.55} + \frac{(31-21.45)^2}{21.45} + \frac{(30-30.85)^2}{30.85} + \frac{(8-7.15)^2}{7.15} \\ &+ \frac{(61-51.96)^2}{51.96} + \frac{(3-12.04)^2}{12.04} + \frac{(59-57.64)^2}{57.64} + \frac{(12-13.36)^2}{13.36} \Rightarrow \\ &0.985+4.252+0.023+0.101+1.573+6.788+0.032+0.138=X^2_{\text{cal}} \\ &13.892 \end{aligned}$$

Interpretation: Since X^2_{cal} for $d.f = 3$, and 5% significance level = 7.815, and $13.892 > 7.815$, H_0 should be rejected. This means that there is a significant difference between the various categories of respondents in their views about service comfortability.

Test of hypothesis on the safety of the service

Table 7 describes the respondents' report and the expected frequency of the safety of service.

[Place Table 7 Here]

$$\begin{aligned} X^2 &= \sum_{i=1}^k \left(\frac{o - e}{e} \right)^2 \\ \text{Degree of freedom (k)} &= (4 - 1)(2 - 1) = 3 \end{aligned}$$

$$x^2_{cal} = \left(\frac{104 - 102.57}{102.57}\right)^2 + \left(\frac{17 - 18.42}{18.42}\right)^2 + \left(\frac{32 - 32.21}{32.21}\right)^2 + \left(\frac{6 - 5.79}{5.79}\right)^2 + \left(\frac{54 - 51.71}{51.71}\right)^2 + \left(\frac{7 - 9.29}{9.29}\right)^2 + \left(\frac{57 - 58.49}{58.49}\right)^2 + \left(\frac{14 - 10.51}{10.51}\right)^2 \Rightarrow$$

$$0.0199 + 0.1095 + 0.0014 + 0.0076 + 0.1014 + 0.5645 + 0.0380 + 1.1589 \Rightarrow 2.0012$$

$$x^2_{cal} = 2.001$$

Interpretation: Since x^2_{cal} for d.f = 3, and 5% significance level = 7.815, since $2.001 < 7.815$, therefore H_0 is correct and reject H_1 , which means that there is no significant difference between the various categories of respondents in their views about safety of service. The respondents generally saw the level of safety as good.

Test of hypothesis on the arrival and departure time

Table 8 describes the respondents' report and the expected frequency of the arrival time and departure time.

[Place Table 8 Here]

$$x^2 = \sum_{i=1}^k \left(\frac{o - e}{e}\right)^2$$

$$\text{Degree of freedom (k)} = (4 - 1)(2 - 1) = 3$$

$$x^2_{cal} = \left(\frac{14 - 27.74}{27.74}\right)^2 + \left(\frac{94 - 80.26}{80.26}\right)^2 + \left(\frac{9 - 7.45}{7.45}\right)^2 + \left(\frac{20 - 521.55}{21.55}\right)^2 + \left(\frac{19 - 14.89}{14.89}\right)^2 + \left(\frac{39 - 43.11}{43.11}\right)^2 + \left(\frac{24 - 15.92}{15.92}\right)^2 + \left(\frac{38 - 46.08}{46.08}\right)^2 \Rightarrow$$

$$= 6.81 + 2.35 + 0.32 + 0.11 + 1.14 + 0.39 + 4.10 + 1.42 = 16.64.$$

Interpretation: Since x^2_{cal} for d.f = 3, and 5% significance level = 7.815, and $16.64 > 7.815$, H_0 is rejected. This means that there is a significant difference between the various categories of respondents in their view about maintenance of arrival and departure time.

Customer characteristics

Customers who use urban bus mass transit (Abuja Urban Mass Transport Company and Nationwide Unity Transport Company) in Federal Capital Territory, Abuja returned 298 questionnaires. Respondents were 46.78% male and 53.22% female. The age range include 1.02% below the age of 15 years; 25.0% in the range 15-24 years; 40.34%

between 25 years and 34 years; 23.05% 35-44 years; 9.83% 45-54 years; while 0.68% were 55 years and above. The pie charts in figure 4 describe the customers' characteristics.

[Place Figure 5 Here]

DISCUSSION

From the study, it was observed that 40% and 31% of Abuja Urban Mass Transport Company and Nationwide Unity Transport Company respectively reported of using urban mass transit. Before the introduction of the mass transit, 35% of the respondents used private cars for their traveling, 23% taxi, 17% motor cycle and 25% mini bus. With respect to availability, 60% of the respondents responded that the urban mass transit is not available all the time, while 40% responded that it is available. Walking distances to board the mass transit bus vary with 69% of the respondents walking between 50-100 meters, 21% between 100 meters-1 km and 10% between 1-2 km. With respect of getting seats when on board the bus, 44% reported that they get seat every trip, 32% once in two trips, 17% once in every five trips, 5% once every ten trip and 2% never get seat. Waiting time at the bus stops, 43% reported of waiting more than 15 minutes, 24% waits between 10-15 minutes, 19% waits between 5-10 minutes and 14% waits for 5 minutes. Most respondents were not happy with how the bus mass transits perform: 30% were very satisfactory, 10% were satisfied, while 48% were not satisfied. 55% of the respondents use bus mass transit because it is safer and cheaper when compared with other modes of transport. Many respondents of about 65% complained of traffic congestion during peak periods, and it need government attention to call for the rescue of the bus mass transit by providing bus lane in the city. Finally, in testing the hypotheses of the study, the researcher observed that in opinions about affordability, regularity, maintenance of arrival and departure time, and comfortability of service, there is a significant difference between the various categories of respondents. But, about safety of service, there is no significant difference between the various categories of respondents.

CONCLUSIONS

The study has found out that the most patronized mass transit operator in Abuja is AUMTCO, followed closely by NUTCO. Since 43% of the bus mass transit reported of waiting more than 15 minutes, 24% waits between 10-15 minutes, 19% waits between 5-10 minutes and 14% waits for 5 minutes, it is clear that there should be room for improvement, especially in the management of available vehicles, so as to increase their operating frequency. Based on the findings, the study recommended pragmatic strategies such as upgrading of the existing road transport networks and organized Bus Rapid Transit (BRT), Rail Rapid Transit (RRT) systems and Bus Lane to help the existing bus mass transit system, among others, to provide effective and efficient public transport system in the study area. Introduction of Bus rapid transit (BRT) is a broad term given to a variety of transportation systems that, through improvements to infrastructure, vehicles and scheduling, attempt to use buses to provide a service that is of a higher

quality than an ordinary bus line. The BRT will play a leading role in transforming public transport within cities to a situation where it will become the preferred mode of travel for the majority of residents, and where it will make a major contribution towards the more efficient development of the city as a whole. Most of the systems are part of a new international trend in city development and re-development called transport-orientated development (TOD). This is based on successful projects in South America that started in Brazil in the 1970s. Successful BRT systems in Bogota and Brazil have improved commuter travelling times in these cities reduced the number of accidents and contributed to improved air quality. The essential difference between a bus system and BRT is that BRT operates longer buses on dedicated bus lanes. Passengers get a regular, faster and congestion-free ride [21]. The Johannesburg Rea Vaya operator business plan has been modelled on successful BRT systems in Latin America, where they have almost identical situations to those in South Africa, with large numbers of minibus taxis and buses vying for passengers, and where both incumbent taxi and bus operators have become the new BRT operators. This BRT is best achieved by providing exclusive grade-separated right-of-way. However, these rights-of-way may be difficult to obtain, costly to develop, and not always located in areas of the best ridership potential. Therefore, street running ways or at-grade intersections in an otherwise exclusive or separated running way may be required [21]. Bus Rapid Transit (BRT) is a general term that refers to improvements in infrastructure, operating structure, and supporting technologies designed to enhance service quality over ordinary bus service. BRT is a flexible mode, able to operate in general traffic or on dedicated or priority lanes. BRT systems have been implemented in cities around the world, and BRT is beginning to make a significant mark in the countries like United States. Although the potential of BRT as a cost-effective mobility option is well-established, its ability to catalyze economic activity and transit-oriented development has not been well studied. This BRT project was designed to fill this gap by examining the experiences of cities in developed countries with significant BRT-related [(14)]. Furthermore, the bus mass transit operator should be encouraged to always use feedback method to evaluate their services through the customer users' satisfaction. The researcher also suggest that the government should devote more attention in maintenance of road transport infrastructure by allowing the Public Private Partnership to come into transport infrastructural development in order to eliminate the unnecessary traffic congestions in most area of the study area. They should also provide park and ride in order to encourage those that are still using their private car so as to patronize the bus mass transit and as well reduce congestion in the study area. Finally, in testing the hypotheses of the study, the researcher observed that in opinions about affordability, regularity, maintenance of arrival and departure time, and comfortability of service, there is a significant difference between the various categories of respondents. But, about safety of service, there is no significant difference between the various categories of respondents.

Table 1: Vehicle Operation Performance Summaries per Bus for Year 2007

	Work ing Days	Trip s	Passe nger Vols.	Vehi cle Km	Reven ue Naira (N)	Work ing hour
Avera ge	236	131 5	10695 8	7002 0.04	587408 3	3292
Maxi mum	297	178 2	14542 2	1056 2	104660 10	4247
Minim um	4	12	1520	1296	75420	58

(Source: Nwaogbe, Obioma et.al, 2011)

Table 2: Abuja Urban Mass Transport Company (AUMTCO) Record.

Ye ar	No. of Rou tes	Bus Hours	Passen gers Volum e	Kilomet er (Km)	Revenu e (N)	Disp atch Buse s
19 98	6	388,08 9	5,867,1 36	20,111, 904	205,34 9,760	93
19 99	6	375,57 0	5,761,5 36	19,811, 520	175,23 0,720	90
20 00	6	318,24 0	5,484,3 36	18,673, 920	164,53 0,080	85
20 01	6	299,52 0	4,529,6 20	17,340, 160	135,85 8,600	80
20 02	6	196,56 0	3,342,6 80	15,398, 400	125,13 4,000	60
20 03	3	131,04 0	2,057,2 00	6,360,0 00	72,860, 000	40
20 04	3	74,880	1,343,2 00	4,680,4 00	50,160, 000	20
20 05	3	26,208	317,46 0	2,982,4 80	11,123, 800	8
20 06	25	432,43 2	546,00 3	1,021,4 06.4	27,037, 514	45
20 07	25	17181 4.5	4,813,1 05	3,150,9 01.6	264,33 3,720	45
20 08	27	565,07 8.80	11,026, 015	14,426, 206.4	596,77 7,620	148

(Source: Abuja Urban Mass Transport Company, 2008)

Table 3: Nationwide Unity Transport Company (NUTCO) Record

Year	Number of Routes	Bus Hours	Passenger Volume	Kilometer (Km)	Revenue (N)	Dispatch Buses
1998	Nil	Nil	Nil	Nil	Nil	
1999	Nil	Nil	Nil	Nil	Nil	
2000	Nil	Nil	Nil	Nil	Nil	
2001	Nil	Nil	Nil	Nil	Nil	
2002	Nil	Nil	Nil	Nil	Nil	
2003	Nil	Nil	Nil	Nil	Nil	
2004	Nil	Nil	Nil	Nil	Nil	
2005	Nil	Nil	Nil	Nil	Nil	
2006	18	602,112	2,337,744	3,689,570.4	15,225,580	120
2007	18	458,388	5,644,259	16,443,802.8	40,022,100	110
2008	18	362,880	1,671,462	12,756,441.2	11,367,060	100

(Source: Nationwide Unity Transport Company, 2008)

Table 4: Regularity of service

	Yes	No	Total
Graduate	63 (71.45)	41 (32.55)	104
Undergraduate/NCE/ND/TC11	62 (54.96)	8 (25.04)	80
WASCE/SSCE/FSCL/Non Formal Education	44 (42.59)	18 (19.41)	62
Total	169	77	246

(Source: Field Survey 2008)

Table 5: Affordability of service

	Yes	No	Total
Graduate	103 (101.69)	14 (15.31)	117
Undergraduate/ND/TC11/NCE	94 (121.26)	11 (13.74)	105
WASCE/SSCE/FSCL/Non Formal Education	62 (66.06)	14 (9.94)	76
Total	259	39	298

(Source: Field Survey 2008)

Table 6: Comfortability of service

	Yes	No	Total
Graduate	83 (92.55)	31 (21.45)	114
Undergraduate	30 (30.85)	8 (7.15)	38
ND/TC11/NCE	61 (51.96)	3 (12.04)	64
WASCE/SSCE/FSCL/Non Formal Education	59 (57.64)	12 (13.36)	71
Total	233	54	287

(Source: Field Survey 2008)

Table 7: Safety of service

	Yes	No	Total
Graduate	104 (102.57)	17 (18.42)	121
Undergraduate	32 (32.21)	6 (5.79)	38
ND/TC11/NCE	54 (51.71)	7 (9.29)	61
WASCE/SSCE/FSCL/Non Formal education	57 (58.49)	14 (10.51)	69
Total	245	44	289

(Source: Field Survey 2008)

Table 8: Arrival and Departure time

	Yes	No	Total
Graduate	14 (27.74)	94 (80.26)	108
Undergraduate	9 (7.45)	20 (21.55)	29
ND/NCE/TC11	19 (14.89)	39 (43.11)	58
WASCE/SSCE/FSLC/Non Formal Education	24 (15.92)	38 (46.06)	62
Total	66	191	257

(Source: Field Survey 2008)

Figure 1: Location of Federal Capital Territory in Nigeria



Figure 2: shows the route map of Abuja, Federal Capital Territory of Nigeria.

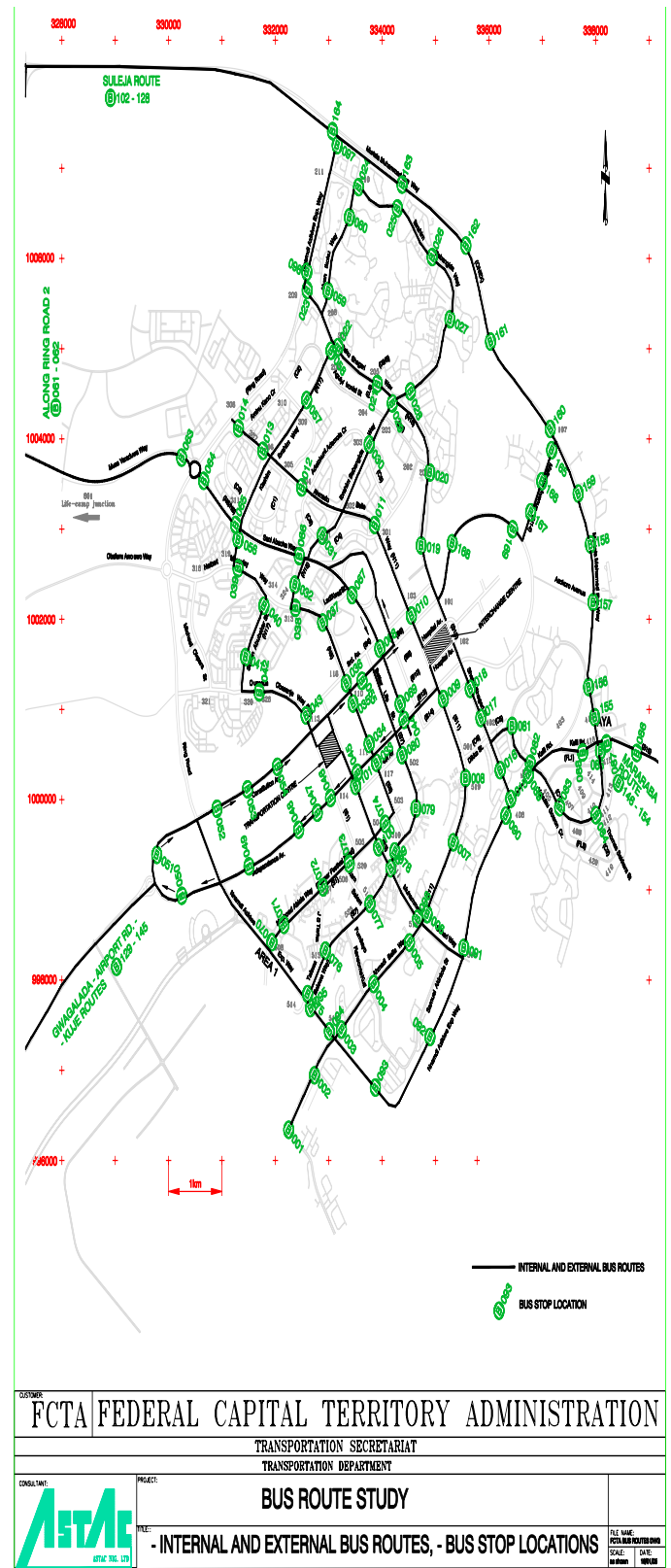


Figure 3: Abuja Urban Mass Transport Vehicle Distribution.

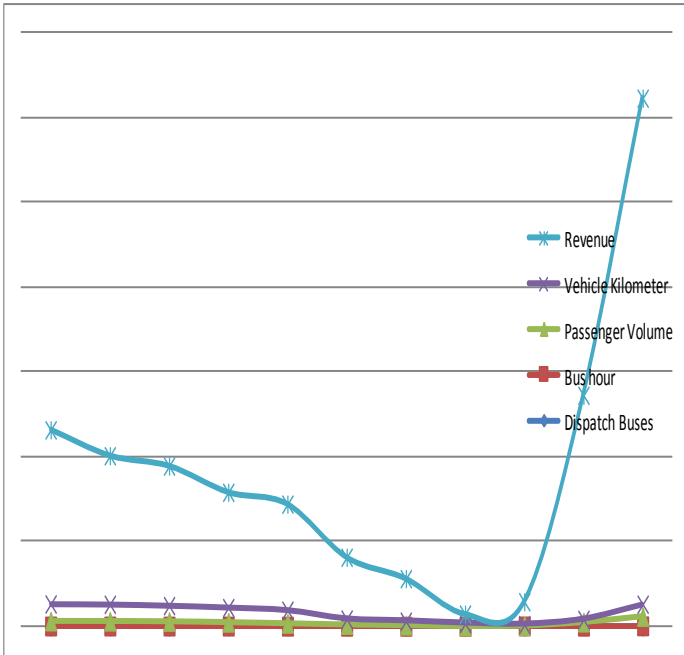


Figure 4: Nationwide Unity Transport Vehicle Distributions.

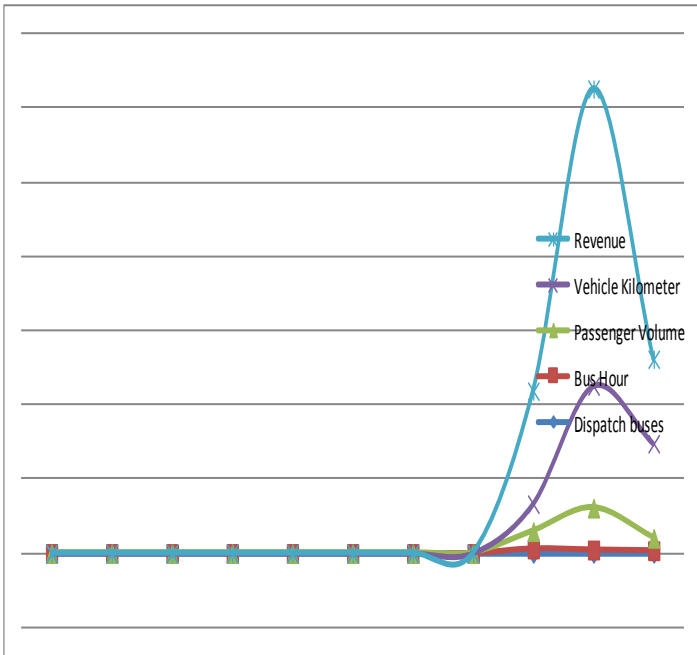
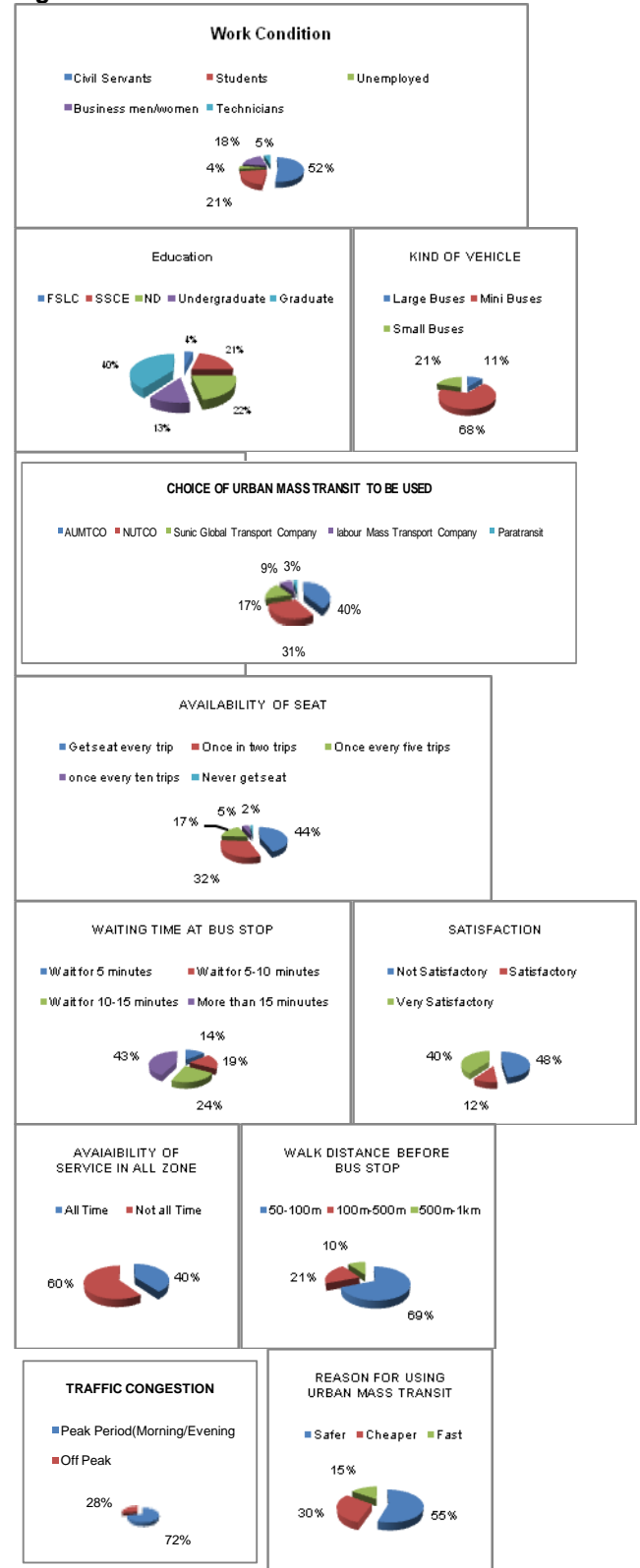
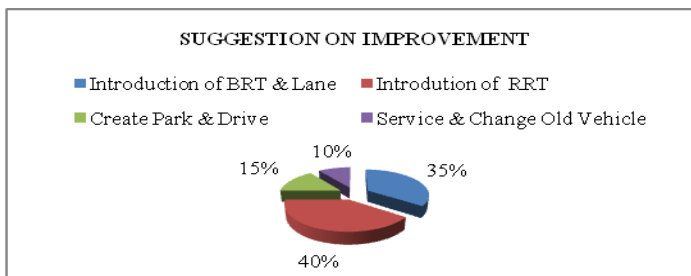
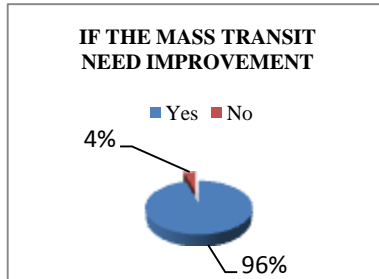
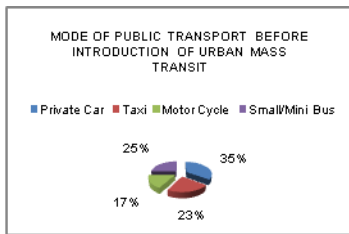


Figure 5: Customers' Characteristics





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[ults.pdf](#)^ See [List of Abuja Federal Capital Territory Ministers](#) for a list of prior ministers

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