AN APPRAISAL OF THE PROPOSAL FOR ABUJA PUBLIC TRANSPORT INITIATIVE (ABUTRANS)

BY

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OCTOBER, 2006

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M.SC. (U.R.P) THESIS

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B.SC. (HONS) GEOGRAPHY
B.U.K

A THESIS SUBMITTED TO THE POST GRADUATE SCHOOL, AHMADU BELLO UNIVERSITY, ZARIA
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DEPARTMENT OF URBAN AND REGIONAL PLANNING
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AHMADU BELLO UNIVERSITY, ZARIA

OCTOBER, 2006

DECLARATION

I declare that this thesis entitled "An Appraisal of the proposal for Abuja public transport initiative (ABUTRANS) has been performed by me in the Department of Urban and Regional Planning under the supervision of Mal. U.F. Yahaya and Mr. E.O. Gunn. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any university.

_____ _____

Yakubu Dahiru *Date*

DEDICATION

This research work is dedicated to my late father Mallam Dahiru Maikano for his fatherly support and encouragement, who do not live to yield the fruit of this work. May his gentle soul rest in perfect peace (Amin).

CERTIFICATION

This thesis entitled, "AN APPRAISAL OF THE PROPOSAL FOR ABUJA PUBLIC TRANSPORT INITIATIVE (ABUTRANS)" by Dahiru Yakubu meets the regulations governing the award of the degree of M.Sc. (Urban and Regional Planning) of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge, and literary presentation.

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Dahiru Yakubu

ABSTRACT

One of the most important reasons for the transfer of the seat of government from Lagos to Abuja was the problem of traffic congestion caused by prevalence of too many private cars. Lagos was congested and movement of vehicles was becoming a serious problem. In order to avoid the same mistake, measures were taken in the Abuja master plan to encourage the use of High capacity public modes of transportation. This was to discourage the use of private cars at peak period. But this dream was not translated into reality and so the problem of traffic congestion has manifested in F.C.T.

This study examine an aspect of transport planning that is concerned with identifying the critical knowledge base required for improving travel mode choice from private to public Mass-transit modes in the FCT to ease the problem of traffic congestion.

The result of the investigation shows that the present public transport system in the FCT is grossly inadequate both in quality and quantity to meet the test of time. It is also established that, the major reasons why the traffic condition continues to pile up was due to high level of car ownership amongst various level of educational groups, marital status, different employment status as well as different income groups. All coming from different residential locations in the FCT.

The study further recommends for provision of adequate numbers of buses, improved quality of services, encouraging the use of staff buses by government agencies and parastatals to complement the public buses. It

also recommends that both distance to bus stops and waiting time at bus stops should be reduced. While direct ride to destination through proper routing and low fare charges should be introduced.

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CHAPTER ONE

DESIGN OF THE STUDY

1.1 INTRODUCTION

The policy position of Federal Capital Territory Administration (FCTA) on intra and inter city transport services is to put in place a comprehensive transport system as enshrined by the Abuja master plan. The master plan proposal was based on lessons leant from Lagos, where too many private cars were on the road, causing serious traffic congestion and other Problems. Thus, the need arised to adopt measures aimed at promoting the use of public mass transit. This is to be achieved through the introduction of high capacity mass-transit rail network, buses and a well organized taxi system which will replace the present old taxi plying the city.

The master plan considers that this will encourage public transport mobility for both the captive and choice riders, with the aim of reducing the number of private vehicles and other para-transit modes on the road, there by reducing congestion and air pollution. It is therefore assumed (by the Abuja master plan) that, introduction of public mass transit system will make car commuters adopt a new system practiced in developed countries. In pursuance of this, the F.C.T.A awarded a contract on traffic studies in FCT to cover origin and destination (O&D) surveys with the following objectives: designing of bus routes and bus stops, production of route maps, trip demand analysis and to prepare a draft for final evaluation report. This is to provide the basis for the FCTA to assign bus

routes and fleet. For the same reason, about 33,000 capacity of Park-n-Ride spaces were also proposed in both the bus and rail terminals (FCTA Transport Dept. 2004). It is expected that car owners will park their cars in such place to join the public transit as it is practiced in parts of Europe and Asia.

1.2 STATEMENT OF RESEARCH PROBLEM.

Over the years the Abuja transport plan has suffered greatly due to poor implementation (Chigboh, 2004). The objective and guidelines for achieving smooth traffic flow as suggested by the Abuja master plan was not strictly followed. Because of that, most of the streets in Abuja are characterized by two many commercial motorcycles popularly called "Okada", Old commercial buses operating in an unorganized manner, indiscriminate packing of vehicles by the side of the road and poor taxi system all causing traffic congestion and air pollution in the city. That is why the minister of the Federal Capital Territory Administration (F.C.T.A), Nasir El Rufa'i in 2004 stated that "…it was not difficult to observe that even with the standard of roads network we have in the territory, Abuja was fast heading for mobility crisis just like other cities in Nigeria". Because of that, the present public transport system needs to be re-organized.

The Result of transportation study awarded to M/S ASTAC Nig Ltd in 2005 indicates that the capital city has high level of automobile congestion and air pollution due to increasing number of private cars. The use of aged taxis and commercial buses as well as numerous commercial

motor cycles in the capital city further compounds the problem. The authority considers the transport systems to be grossly inadequate and out of tune with the need and status of Abuja. The FCTA therefore, deems it fit to re-organize the transport sector as envisaged by the master plan through a programme called Abuja public transport initiative (Abutrans) which includes introduction of high capacity modes of transportation i.e. rail and buses for intra and inter city movement.

The assumption made by the Abuja master plan that by introducing an efficient high capacity travel modes in the territory, trip makers in the FCT will be lured from the use of private cars and other para-transit mode, need to be validated. Because such ideas are based on the mode choice behaviours of road users in developed counties, that is, it is assumed that since the system has been successful in such countries, it will also succeed in developing countries such as Nigeria. But, Busie and Rice, (1999), caution the philosophy of wholesome adoption of models from the developed countries for application in the less developed countries (LDCS) given that the urban context, travel behavior, income and cultural settings differ substantially from that of the developed countries. Further more, it is asserted that simply trying ideas without a clear understanding of the factors that are likely to lead to success or failure is likely to produce undesirable result and may even lead to backlash against progressive policies Barnes and Davis (1999).

In order to understand and put into consideration the peculiar nature of travel behaviour of the Abuja residents, while implementing the

initiative, there is the need to conduct a study to find out the determinants of mode choice in FCT. This study will complement the commissioned transport survey awarded by FCTA to ASTAC NIG LTD. The two studies will serve as a stronger basis for implementing the Abuja public transport initiative (Abutrans).

RESEARCH QUESTION

1. What are the features of the Abuja public transport initiative?
2. In what way will understanding the existing mode choice behaviours improve on the success of the transport initiative in FCT?

1.3 AIM OF THE STUDY

The aim of the study is to examine the travel modes determinants in FCT with a view to enhancing the implementability of the Abuja public transport initiative.

OBJECTIVES

i. To review the concept of urban public transport system and the determinants of modal choice in cities.
ii. To examine the existing public and private transport operators and to analyze the composition of various travel modes in FCT.
iii. To analyze the components of the Abuja public transport initiative (Abutrans)
iv. To examine the factors that determine present travel mode choice in the Federal Capital Territory

v. To suggest possible ways of improving the implementability of the new transport initiative.

1.4 SCOPE AND LIMITATION

Abutrans entails re-organizing all the travel modes operating in the FCT. This study is limited to aspect of the programme that is related to public transport provided by the bus mass transit for inter and intra city transport services. The proposed light rail system is not to be covered in this study. This is because the bus option is more or less on ground at present, but not coordinated in line with the Abuja Master plan objectives.

Emphasis on this study is directed on how to encourage people using various travel modes such as private cars, taxis motorcycle and others to join the new bus-transit system on home work trips.

The area covered in this study is limited to area within the political boundary of the FCT for easy collection of data.

Recommendation will be geared towards finding ways of improving the implementation of the new transport initiative, so as to improve rider-ship of the mass-transit system among the choice and captive riders.

1.5 METHODOLOGY

The study methodology can be examined through:

a. Data collection i.e Traffic survey.

b. Questionnaire Administration etc.

1.5.1 TRAFFIC SURVEY.

This is to determine the level of traffic flow in some important and major routes especially at peak periods. Manual traffic counts were carried out on recognized major routes. Eight (8) roads were selected. The counting took place from 6.30am to 6.30pm for three consecutive days. The average of the figures was used as the main data. This will help in analyzing both the composition of various travel modes and the volume of traffic in each of the selected survey stations.

1.5.2 QUESTIONNAIRE ADMINISTRATION.

Questionnaire was structured and designed to show all the information required on the socio-economic characteristic of the trip maker and their mode choice patterns. The questionnaire was basically divided into three sections. These are information about the respondents, information about qualities of transport services and information about the general factors that influence respondents' choice of travel modes.

Sample survey data were drown from the three satellite towns and part of the city center namely, Gwagwalada, Nyanya, Kubwa and some part of the FCC.

To administer the questionnaire a systematic sampling of one out of 100 houses was visited, while for some part of the city centre important working places were visited at random. A total of 350 questionnaire where administrated as follows; city center 82, Gwagwalada 47, kubwa 43 and Nyanya 30. After removing the defective ones only 202 questionnaires were analyzed and used in this report.

1.5.3 SECONDARY DATA.

The secondary source of data collection for the study includes land use maps, government statistical records, unpublished and published materials.

1.5.4 FIELD OBSERVATIONS.

This is to give the researcher adequate knowledge of the

study area which will enhance important suggestions and proposals.

1.6 TECHNIQUES OF DATA ANALYSIS

Both descriptive and structural tools are used in the analysis of data in this study. Mean, standard derivation and percentages were used to describe socio-economic variables and some information about the household characteristics. Analysis of variance was used to test differences in each of the variables against mode choice, while correlation technique was used to identify the relationship and level of influence of each of these variables. Cross tabulation analysis was finally used to identify the major determinants of modal choice in the study area.

1.7 DEFINITION OF TERMS

For clear understanding of the terms as they appear in this study, the following terms are defined for the purpose of this study as follows:

Captive Rider: Is a commuter that has no means of transport of his own except the commercial modes.

Choice Rider: A person who has an alternative mode of transport added to his private transportation mode example bus, motorcycle, official vehicle etc.

Public Transport: This is taken in this study to mean all commercial or modes of transport, example, commercial motorcycle, taxis, buses, boat etc. excluding personally owned vehicles or official vehicles.

Organized Public Transport: These are public transport operators that are registered with co-operate affairs commission to provide commercial transport services to the public. They are called organized, because they are orderly on road and have proper schedule and definite stopping areas to pick and drop passengers. They operate as corporate entity and so has standard workshops, terminal and well-trained staff to run the affairs of the organization. They mostly operate as a company.

Un-organized Public Transport Operators: Although registered with the co-operate affairs commission under a national umbrella. Ownership of vehicle fleet is on an individual basis. Because of that the service provided are not regulated and uncontrolled. Public transport services under this system is characterized with direct opposite to what is obtained in the organized public transport operators. Lack of orderliness on road, poor connectivity, lack of trained drivers and standard workshop. This forms of un-organized public transport outfits are the types commonly

found in most of our towns and cities providing various forms of transport service.

Mass – Transit System: In this study mass – transit is taken to mean any travel mode that is capable of conveying at least minimum of forty (40) passengers at a time and characterized with the following: Proper scheduling, have designated stops for picking up and discharging of passenger, more orderly on the road, more comfort, decent and more organized with relatively good level of services. Therefore, any vehicle that convey more than (40) passengers but has not met the above services requirement is not fit to be called a mass – transit outfit in this study example the mini – bus, kia – kia buses and the "molues" etc.

Para – Transit Modes: Vehicles that convey maximum of (39)passengers to a minimum of just a passenger example motorcycle, "keke Napep", mini – buses etc.

CHAPTER TWO

THE CONCEPT OF URBAN PUBLIC TRANSPORT SYSTEM AND DETERMINANTS OF MODAL CHOICE IN CITIES: A REVIEW OF LITERATURE

2.1 INTRODUCTION

This chapter reviews the literature on some basic concepts, definition and factors that are central to this research. The concepts include those of public transport modes and that of mass-transit system. Other aspects reviewed in this chapter include the concept of modal choice and various factors that determine modal choice in cities. This is aimed at establishing some necessary basis from the literature to support this study.

2.2 PRIVATE AUTOMOBILES VERSUS PUBLIC TRANSPORT MODES FOR URBAN COMMUTING

Bala, (1976) asserts that, the issues of whether public policy should encourage the use of privately owned cars or public transit for urban commuting has been a subject of great debate since the late nineteen fifties. One of the schools of thought believes that only large public investment in mass transit facilities can save cities from strangulation by congestion. A second school of thought believes that the advantage of the privately owned automobile to relatively high-income commuters are so great that no viable alternative exist and so should be encouraged above other modes. While a third school of thought advocate a balanced urban transportation system usually interpreted to mean

substantial investment in urban expressway. So far this idea has or is still the operational definition in many developing countries.

Many professionals have argued that a greater use must be made of public transport in towns. For instance at the second international conference on urban transportation held in Pittsburgh in April 1967, Dr. F. Seltz, president of the U.S National Academy of science argued that "mass transportation is the only solution for bringing people into the cities and Mr. L Cusick, the Director of Urban Transportation in the U.S. Department of Housing and Urban development, said that "…commuting journeys from suburbs are becoming long and tiring, the trend must be reversed by improved transportation system which will involve less use of private cars.

Generally therefore, there has been greater need for public transport for urban transportation in developed countries. While in developing countries many towns are growing while new roads are either tarred or constructed. In Nigeria there has been the growing demand in public transport and this is reflected in the interstate mass transit system.

2.3 CONCEPT OF PUBLIC TRANSPORT SYSTEM

As stated earlier, the main type of public transport system available includes the buses, light Rail transport and Rapid rail transit. Others are motorcycles, Taxis, boats and trams. The technical and economic characteristic of these options and other para-transit are well covered in World Bank policy study on Urban Transport (Armstrong – Wright 1980). Each of these options has its peculiar technical characteristic as well as investment implication. Furthermore, any or a combination of the above option can be adapted to suit individual urban centers or inter-city network. Indeed there are examples from both developing and industrialized countries where urban centers of similar size and characteristic have adopted different public transport options. But generally speaking the choice or group of option are influenced by the following (Bolade, 1989).

a. Population area size and morphology of the city.
b. The type, nature and volume of the city transport demand and travel characteristic.
c. The income level or economic properties of the city
d. Land-use pattern and other socio-economic characteristic of the city.
e. Other peculiar local conditions.

From the pattern that has emerged over the years in many industrialized countries, (Bolade, 1989), asserts that the following generalization can be made.

i. For highly populated and high density cities (population greater than one million) – rapid rail transit in conjunction with other bus transit option is required.

ii. For medium density cities (population of a half to one million) light rail transit and/or comprehensive conventional bus system.

iii. For low density cities (population less than half a million) complete use of conventional, but more importantly intermediate, medium bus services and some other para-transit mode.

iv. Water transport is generally used in any of the above groups where possible.

Every society has a requirement for mobility and the functions of public transport is therefore to enable people with out access to private transport to satisfy those economic and social needs, which can not be fulfilled within walking distance. And also to provide an alternative to people with personal or private transport White, (1986). However, there is the need to control the activities of the private cars in cities for easy traffic flows.

2.3.1 LIMITATIONS OF PUBLIC TRANSPORT SYSTEM

Public transport especially in developing countries are mostly unorganized, undisciplined and inconvenient mode of transportation in

most of the cities. Competition among them is intense but hardly benefits the consumers, because the demand for public transport modes had outstripped their supply (Bolade, 1989).

Public transport is supposed to be cheap, fast comfortable, accessible and convenient to users like those found in the developed countries, characterized with well equipped and attractive terminals and polite staff. (Bolade, 1989).

However, in Nigeria public transport service is characterized with rude and reckless drivers who are among the major causes of road accidents in cities. They drive on pedestrian walk ways, block roads and seem to take pride in breaking traffic rules. Most of the time mini buses, taxis and commercial motorcycles pick up and drop passengers anywhere having no designated stops. With this manner of indiscriminate parking they endanger the lives of pedestrians and motorist alike. They also threaten and disrupt smooth traffic flow causing serious traffic congestion (Abdu, 1995). In Lagos for example residents from the suburbs wait at least 30 minutes to catch a bus and then ride nearly an hour for the 16 kilometer trip to the central business district (CBD). In other large and spreading cities in the developing world the situation is the same.

In most developing countries, the economy depends a great deal on the efficiency of public transport services, since between 50 – 80 percent of the national wealth is produced in cities, when transport is inadequate, everything suffer (Maxwell, 1996).

In cities with less than 100,000 residents, traffic is not so congested, and a reasonable good system of streets and mini buses can usually handle the flow. Once over this size, however, cities generate more traffic of all sorts more cars, trucks, mini-buses motorcycle, bicycle and pedestrians all competing for road space. This leads to serious traffic chaos in the city (Adeofolalu, 197 7).

2.3.2 OWNERSHIP AND MANAGEMENT OF PUBLIC TRANSPORT SYSTEM

It is important to distinguish between the private sector, transport operator and the public sector. The regulated private transport operators in developing countries can be described as formal while the unregulated public transport operator can be categorized as informal. Their informality is derived from the fact that they are not licensed to provide public transport service in the city (Pope, 1995).

In the developing countries, the activities of the private sector in Urban Passenger transport operation are known to have exceeded that of the public (Government owned) especially the bus mode Adeniyi, (1983). Despite the dominance of the private sector over government owned, in terms of fleet numbers and spatial coverage little is known about their activities until recently (White, 1986).

While in United State of America public transport service are mainly privately owned and operated. But this is done under close governmental regulation, which aim to ensure that the utility serves all those who apply for it (Owen, 1988). Government does not provide public

transport service but have regulatory bodies charged with the effective handling of the utility.

Public transport can be supplied or provided by the public or private sector as the case is in India, Malaysia and in Britain after 1984. It can be provided by only one particular sector or a combination of the two sectors depending on the type of public transport mode. It is the combination of effort of the two sectors to provide public transport services that is predominant in the developing societies and this is equally gaining prominence in the developed countries as a result of changing government policy towards how public transport can be provided and financed. (Kitchin, 1947).

2.4 CONCEPT OF MASS – TRANSIT SYSTEM.

Bolade (1989), state that mass transit by definition connotes a high capacity means and mode of transporting large number of people within a given network with relatively short term head ways and reasonable turn around time. Mass-transit system is also a component of public transport systems. Broadly speaking mass transit comprises mainly of the rapid rail system (i.e the sub-ways, under ground rails bus system and where feasible water transport system). Each of these options has its own peculiar technical and operational characteristics as well as investment implication. Furthermore, any or a combination of the above system can be adapted to suit individual urban centre or inter-city network. However, the choice of options or group could be influenced by population, area

size and morphology of the city or regional area, their transport demand characteristic andland-use pattern and other special or peculiar features.

This conceptual definition according to (Bolade, 1989), leads to the following two basic clarifications on how mass transit is generally misconstrued.

a. Where as all forms of or option of mass transit are public transport not all forms of public transport are qualified to be called mass – transit (e.g. motorcycle, taxis and mini-buses).

b. Mass transit systems are more relevant in the major urban centre and intra – state and inter – state routes where both population concentration and/or effective demand are high. Given the low and disperse population in rural area and region mass transit as a concept is not really relevant in such areas.

2.4.1 ADVANTAGES OF AN EFFICIENT MASS -TRANSIT SYSTEM

Okpala (1977), states that an organised mass - transit system has great advantages in urban passenger transportation. They carry more people at a time than cars and mini-buses. They tend to operate on more definite schedules and have designated stops for the picking-up and dropping of passengers. They are also more orderly on the road and much more comfortable than smaller or intermediate size buses. Where well organized with relatively good level of services, like in Europe and America, the bus has the potential of being used as a policy tool to

reduce the number of car on urban roads and so reduce traffic chaos in the city.

Besides its role in helping to reduce the number of cars on the road, the bus and the rail system for example in developed countries have high levels of patronage among the rich and influential group, while in developing countries reverse is the case, it is mostly the car disadvantage group the (captive riders) that patronize the public transit (Pedoski, 1980).

Hemily (2004) asserts that, Mass transit has posted some significant gains in rider-ship in recent time among both the captive and the choice riders in U.S.A. Substantial rider-ship increase have occurred in bus rapid transit and rail based cities such as New York city and Washington DC.

2. 5 ENCOURAGING CAR OWNERS TO USE MASS-TRANSIT MODES

The most potent cause of urban traffic congestion is the existence of too many cars for the available road space. If therefore, car owners will not be induced from the use of their cars during rush hours, the general good will demand that ways be found of coercing them into transit use. In doing this the very first thing to do would be improving the mass transit equipment ensuring greater frequency and reliability of their services, making them clean, decent and fairly comfortable and ensuring a wide coverage of the city areas in their operation (Okpala, 1977). Mass-transit system with such levels of service will be a reasonable alternative to car owner at the peak period.

Pratt and Dean (1967) states that in developing countries such as Ghana, Nigeria and Kenya no mode (including the bus transit) can compete with the private car unless some constraints are placed on the use of the cars. The reason is that, because of the attributes of the private car – its comfort and convenience even on congestion lines, its prestige symbol and its flexibility; as long as it is available to a person, it will be used regardless of the cost.

Policies aimed at decreasing private transportation by means of increased cost include fuel taxes, parking fees and road tolls in city centers. The last two are particularly relevant for tackling congestion, since they directly increase the cost of entering the city. As discussed by (Small, 1992). Increase parking fees are likely to have a substantial effect on private transport including both car-pooling and a substitution towards public transportation. The design and quality of the mass-transport system is thus an important factor itself in discouraging the use of private transportation by providing a suitable substitute to the private mode. Some measures include a relocation of road space favouring exclusive "right of way" for buses in order to reduce travel time, enhanced safety and comfort on board and improved scheduling and punctuality in order to reduce waiting time (Thamson, 1998).

Alpizar and Carlsson (2001) state that Costa Rica is an example where mass-transit services is well structured and organized to deal with congestion in the city centre, routes are structured into trunk and feeder

system, by that, only fewer buses were designated to enter into the city centre, considerable success is noticed and so the mass transit system recorded a high level of rider-ship, because most of the car commuters switched to the mass-transit system.

2.6 CONCEPT OF MODAL SPLIT

Bruton, (1970) defined split as the proportionate division of the total number of person trip between different means or modes of travel. It can be expressed numerically as a fraction or number of fraction, ratio or percentage division between bus, car, rail and other modes by the total number of trips.

Other scholars like (Warners and Daniel, 1980), described modal split as the process of arriving at a decision about which mode to use in any particular set of circumstance. (Papacostas, 1990), also defines modal split as being concerned with the behaviour of trip makers regarding the selection of travel mode. This is the approach that is often used to describe modal choice analysis and it is applied in studying behavioural patterns during preparation of transportation plans. In some instance, modal split has been used within the context of transport (traffic) restraints policies aimed at influencing trip maker behaviour.

2.6.1 FACTORS INFLUENCING MODAL CHOICE

Ademola (1998) states that factors influencing modal choice can be classified into four groups, these include:-

i. Characteristics of trip maker

ii. Characteristics of the journey

iii. Characteristics of the transport facility or service characteristics

iv. Attitudinal and behavioural factors.

2.6.2 CHARACTERISTICS OF TRIP MAKER

Adeniyi (1987), states that socio-economic status of the trip maker had been found to affect his choice of mode. One of the greatest influences of modal choice is the income of the trip maker. Economic influence of the commuter and individual is an important factor in modal choice. This principally affects the choice of mode and number of trip made. The more affluent members of the population make more trips than the less affluence people. People in this category use private transport mode since they can afford to purchase and maintain motor vehicles. While the less affluent groups make less trips and it is by public modes.

Wilson (1967) studied modal split in Coventry and showed that there is a relationship between income and the type of modes an individual patronizes. He observed that people who earn less than $1500 per annum used public modes.

Car Ownership or Availability:- For so many reasons, people that own cars always choose to use it as their mode than patronize public transport. Car ownership is a strong factor in determining modal choice. The

characteristic of the car such as flexibility and reliability added to its advantage especially among the high income groups.

Household Structure:- Population is another factor that affects urban travel and determine choice of mode, not only the number or size of the population, but also the population statistics, such as age, sex composition and economic characteristics of the population. Young generations are found to be making educational and recreational trips in urban areas. While the adult /mostly perform work and shopping trips. The children are fond of making educational trips mostly carried out using private mode or public modes depending on the level of income of the household.

Adams (1994) asserts that, the proportion of male travelers in developing countries is greater than the female travelers; this may be due to the fact that the male population is the bread winner sin the family set up.

Residential Density:- Maxwell (1996) observed that as residential density decreases so also the patronage of public transport. This may be explained by the fact that it may be uneconomical to provide public transportation facilities in low-density areas where higher income earners live. This is because most of them buy and maintain private vehicles. Therefore residential density plays an important role in trip making, since the higher the density of any residential area, the higher the trip it is likely to generate. Higher density areas mostly use public modes, while low density areas mostly use private modes.

2.6.3 JOURNEY CHARACTERISTICS

The nature and character of the journey determines the type of mode to use. The following factors are responsible for this:

Location of Journey:- The location of a trip maker in relation to his home or work place affect his choice of mode. For a person that lives less than one kilometer from his work place may choose to take a walk or cycle, but any distance more than that might decide to use public or private mode.

Trip Purpose:- Most of the time people tend to use public modes when going to the office or school, but it has been observed that ceremonies, shopping and recreation are mostly done by private modes that is within the car owning families.

Length of Trip:- This also affects individuals choice of mode, various methods are used to measure journey length, one of the ways is by measuring distance between zones for both private car and public transport. Another way is by measuring the time taken to complete a days journey otherwise called total journey time. The latter is more preferred because it incorporates the time spent in a vehicle as well as time spent outside the vehicle (excess travel time) during trip. The total time made by public transport includes time spent changing from one public transport vehicle to another (x_2) time spent walking to public transport at origin (x_4) and time spent walking to public transport at

destination (x_5), that is ($x_1 + x_2 + x_3 + x_4 + x_5$) while, the total journey time by car is given as time spent during a car (x_6) time spent parking vehicle at destination (x_7) time spent walking to park vehicle at destination (x_8) that is ($x_7 + x_8$) this formula was developed for use by the national transportation agency (1962) in Washington.

Total journey time is either expressed in time difference (that is time by private car ($x_1 + x_2 + x_3 + x_4 + x_5$) minus time by public transport ($x_6 + x_7 + x_8$) or time ratio (that is time by public transport divided by private car) the use of time difference is preferred because it reveals how relative importance of the transport mode how individuals react to. For example inconvenience, in modal choice, for instance, assuming a journey from point A to point B by private car is 10km per hour, and by public transport in 5km/h a journey of 1km gives a time difference of 6 minutes and time ratio of 0.5 paid for public transport (x_9). While the travel cost for private car is given as cost of petrol (x_{10}) plus cost of engine oil (x_{11}) plus half the cost of parking ($0.5\ x_{12}$) all added and divided by average car occupancy (x_{13}).

Other quality factors are Travel services, studies show that service offered by competing transport modes or even within the same mode influence choice. The service offered or cost incurred differ in terms of comfort. Convenience reliability ease of changing from one mode to another safety etc. These variables of factors are subjective and difficult to quantify. But variables that indicates the inconvenience of travel by

each mode are usually computed. This is computed as excess travel time. (Ett) developed by NCTA in 1962. Excess travel time ETT is defined as the time spent outside the vehicle during a trip. The excess travel time by public transport is calculated as ($x_2 + x_3 + x_4 + x_5$) and the excess travel time by private car is ($x_7 + x_8$). The ETT can be presented as a difference or ratio between the transport mode as a ratio it is presented as;

$$\frac{x_1 + x_2 + x_3 + x_4 + x_5}{x_7 + x_8}$$

2.6.4. CHARACTERISTICS OF TRANSPORT FACILITY

Transport system characteristics is an important element in influencing choice of mode, especially between private car and public transport system. The following are some of the identified factors.

Travel Time: Abdu (1995), asserts that various mode choice studies tend to indicate that any mode with less travel time has the highest percentage of patronage.

Travel Cost: this can bes especially among the low and medium income groups. But it has less effect on the high-income group. The travel cost for public transport is expressed as fare cause of urban traffic congestion due to increase number of cars more than the available road space. Other factors are safety, security direct ride to destination and speed.

2.6.5 ATTITUDINAL AND BEHAVIOURAL FACTORS

In recent years, it has become clear that trip forecast based on these factors can be used to explain trip demand and choice of mode. Where individual perception of the convenience, comfort, risk of mode helps to determine the choice one makers. The attitudinal or behavioural characteristics are supportive factors to the socio-economic factors in helping to determine ones choice of modes. The factors can be classified as follows.

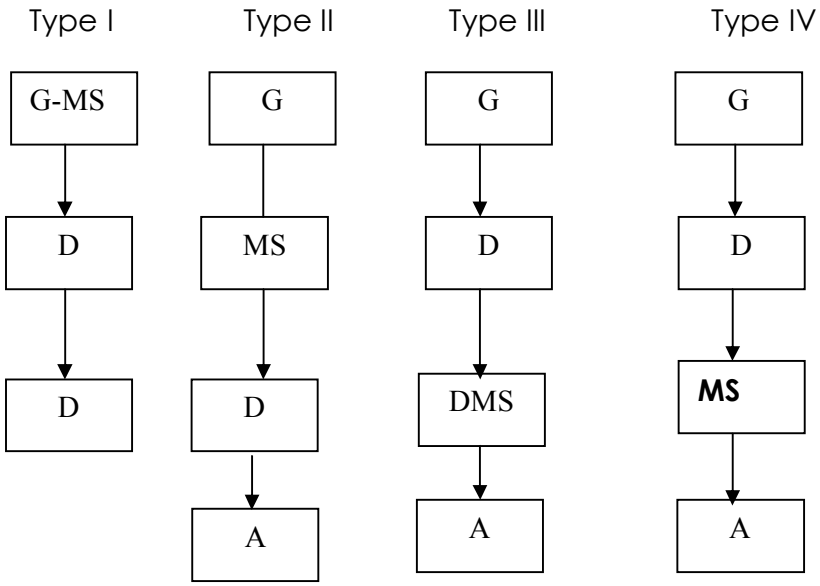
The basic factors that help to decide if trip has to be made at all or not (called Antecedent Rational variables (R) they are those set of factors that help to actualize the plan to make the trip by a specific mode called attitudinal perceived variables (D). Attitude, which is, define by Thornstone (1928) as sum total of mans inclination and feeling, prejudice or bias, pre- conceived notion, ideas threats and conviction about any specified topic, thus, a man's attitude about any mode is all he feels and thinks about that mode. This however, is a subjective and personal feeling based on some other quantitative antecedent factors.

Ogunsaya (1988), states that, attitude is a mental and natural state of readiness, organized through previous experience which exerts a directive or dynamic influence upon the individual's response to all objects with which it is related. In this wise, attitudes include opinions, belief and feeling, which include preparation or readiness responses. All this play vital role in ones selection of mode.

Gunn (2000), identified some attitudinal and cultural factors that affect transport operation in Nigeria directly, but indirectly also influence choice of ones travel mode. These factors include religion and traditional belief, use of abusive language by transport operators to commuters, use of stimulant by drivers, which result in accident. General insecurity associated with travelling in public modes. This directly or indirectly affect the choice of travel mode of individuals.

2.7 APPROACHES TO MODAL SPLIT ESTIMATION

Many factors influence individual choice of a particular travel mode, some of the factors are objective and measurable, others are subjective and difficulty to quantity. As a result variety of modal split approaches have been developed. Fig 2.0: Alternative positions of modal split analysis.



NOTE:

G – Trip generation

D – Trip Distribution

MS – Modal split

A – Trip Assignment

Type I – Modal split combined with trip Generation

Type II- Between trip generation and distribution

Type III- Combined with trip Distribution

Type IV – Between trip distribution and trip Assignment

Fig 2.0: Alternative position of modal split analysis source: (Black J. 1981) Urban Transportation Planning Groom Helm, London pp. 84.

In Fig. 2.0 type I and II models are known as trip-end (pre-distribution) models. These models allocate total person trips to alternative modes of travels before the trip-distribution stage. Type III is known as the gravity type models. While type IV is known as the trip interchange (post-distribution) model. The trip interchange model allocate total trips to alternate models after the total trip have been distributed between zones of origin and destination.

Two types of techniques can be used for the modal split analysis in type I. They are multiple liner regression technique and category analysis.

A typical multiple linear regression techniques is usually in the form of an equation like.

$$Py = b_0 + b_1 + \log x_1 + b_2 \log x_2 + b_3 \log x^3 \ldots. bn\log x_n$$

When:

Py = Percentage (Proportion) of trips by public transport or by private car.

$b_1 – b_2$ = Correlation coefficients

$X_1 - X_y$ = Independent Variables. It could be travel time. Travel cost, car ownership, income etc.

b_0 = regression constant.

For category analysis, households are cross classified by car ownership, household size or family structure and income. This is followed by the calculation of the traffic production by each transport mode for each cross –classification from the home interview survey. While Type IV model could be in the form of diversion curves, multiple linear regression or gravity model.

However, the use of each type of modal split model has to be done with great care. For example, the trip end approach to modal split is capable of showing total person trips distribution of public transport and private car between pairs of zones especially if the difference in lengths of journey by car and public transport is considered. This point could be considered a major weakness of the trip-interchange model.

For the benefit of identifying most influence faction that determine the use of private car as travel mode as it is the case in this study, it is preferred to use the trip end pre-distribution model using the multiple linear regression techniques to determine the factor that strongly influence the dependent variable which is the fraction of car trip in the F.C.T. however, other statistical tools such as the chi-square test or analysis of variance and correlation technique, can be used, as it is the case in this study.

2.8 SUMMARY

In this chapter, a lot of relevant references about the concepts of public transport systems and how to organize it to be effective are discussed. We also see what constitute a mass transit system and how to make it more effective. Enough references also were discussed in this chapter as regards reasons for the choice of modes in city and finally alternative position of modal split analyses are also highlighted. All this provide a strong basis for implementing the new transport programme in FCT.

CHAPTER THREE

AN OVERVIEW OF THE EXISTING TRANSPORT SYSTEMS IN FCT

3.1 INTRODUCTION

This chapter examines the nature of operational and organizational problems associated with existing transports systems in the study area. It further analyzes other traffic details that have to do with direction of traffic flows; traffic volume and modal split analysis and also looked at compositions of each mode in various locations in the capital city. The chapter finally tries to see if there is any justification for the new public transport initiative based on the prevailing transport situation in F.C.T.

3.2 CHARACTERISTICS OF THE EXISTING TRANSPORT SYSTEM IN FCT.

The existing transport system in FCT is composed of few regulated private transport operators, which are described as organized in one hand with proliferated unregulated public transport operators, which are categorized as un-organized. One major characteristic feature that distinguished the organized and un-organized operator is that, the organized public transport operators have conventional transport facilities e.g. buses in its fleet. But the un-organized use the unconventional type of buses. The conventional buses are those that are originally designed to carry large number of people, while the unconventional are those that are adopted for public transport purpose, not originally designed for such purpose example "Molues".

In the FCT there is the dominance of unconventional form of public transport facilities which can again be described as intermediate or paratransit transport mode (UNCH 1985). The un-organized transport operators for example are unregulated and therefore have no defined routes and area of stoppage along their routes and without fixed time schedules. However, most of the facilities especially buses and taxis are old, their average age was found out to be about fifteen years (15) and have dilapidated seats and wind screens. They are generally unsuitable for passenger's transportation. (Kaltho, 2000). The taxi services which have a very limited normal capacity of four passengers at a time per vehicle show a similar operational characteristic with the bus system. The rising trends have largely accounted for the high traffic volume and the congestion at principal bus stops and at the major entrance routes to the capital city on a daily basis. Prevalence of privately owned cars also compounded the problems.

The commercial motorcycle popularly called "Okada" has emerged out of the need to complement the need for an alternative means of transport. Because of its associated problems the authority see it as a great source of worry and so consider it out of tune for the status of FCC, therefore plan to ban it completely away from the FCC.

However, there are also the existences of some few organized public transport outfits in the FCT. Their activities are not well noticed because they have fewer fleet and most of them are engaged in

providing only inter-state services. They however also contribute to the mobility needs of the FCT residents.

3.2.1 ORGANIZED PUBLIC TRANSPORT OPERATORS IN FCT

There are so many organized private transport operators in FCT. But only two of them presently provide inter-city and intra city transport service. The rest provide inter-state transport services. This includes the following:-

1. Pace setter mass – transit.
2. Peace mass – transit.
3. NDDC Transport System.
4. Abia Line.
5. ITC (Imo Transport Corporation.
6. Eagle Line.
7. Edo City Transport Service.
8. Cross Country.
9. ABC Transport.
10. Ekeson Transport.
11. Chisco Transport.
12. Abuja Municipal Transport Services.
13. Abuja Urban Mass Transit Company (AUMTCO).
14. Labour City Mass Transit System (LCMTS) and others.

Abuja Urban Mass Transit Company (AUMTCO) and Labour Mass Transit System (LCMTS) provide inter-city transport services while the (AUMTCO) provide both inter and intra-city services respectively.

See table 3.0 for more detail information about the organized public transport operators.

Table 3.0: Organized public transport operators in FCT

Company name ownership	**Total number of fleet available**	**Number of fleet on road**	**Number of fleet not working**	**Vehicle capacity**	**Type of routes covered**
Abuja Urban Mass Transit Company AUMTCO	29	15	14	30 seater and 50 seater	Intra and inter-city
Labour City Mass Transit System (LCMTS)	30	24	6	50 seaters only	Intercity only
TOTAL	**59**	**39**	**20**	**-**	**-**

Source: Field Survey, 2005

Table 3.0 shows the two existing organized public transport operators in FCT. The Abuja urban mass-transit company AUMTCO which is owned and operated by FCDA, it has only about 29 number of buses out of which only 15 of them are road worthy with about 14 numbers awaiting some repairs as at the time of investigation. The AUMTCO currently provide services along intra as well as inter city routes. These fleets are grossly inadequate when compared with the PCU volume in the FCT. Some of the routes been serviced by (AUMTCO) include;

INTRA-CITY ROUTES

i. Garki – Jabi Park-routes

ii. Jabi – Cenral area

iii. Karmo-Jabi – Garki

INTER – CITY ROUTES

i. Garki/Jabi – Gwagwalada routes

ii. Jabi-Dutse – Bwari routes

iii. Jabi – Kubwa – Suleja

iv Gwagwalada – Rubochi-Abaji routes

The company due to the nature of its primary assignment is operating medium and high capacity buses which range between 30-50 seating capacity with some Toyota Hiace buses for co-cooperate use.

The second organized public transport outfit is the Labour City Mass-transit System (LCMTS). This is owned and operated by the Nigerian Labour Congress, it has about 30 number of buses all have 50 seated carrying capacity, six (6) of its fleet are not on road as at the time of investigation, only 24 are road worthy, put together with those of (AUMTCO) are very inadequate to meet the mobility needs of the Abuja residents. The (LCMTS) operate only on the inter-city routes which includes the following.

i. Garki –Kubwa – Suleja routes

ii. Garki – Dutse – Bwari routes

iii. Garki – Jabi – Gwagwalada routes

iv. Garki – Nyanya – Maraba

Both the (AUMTCO) and the (LCMTS) are faced with so many problems.

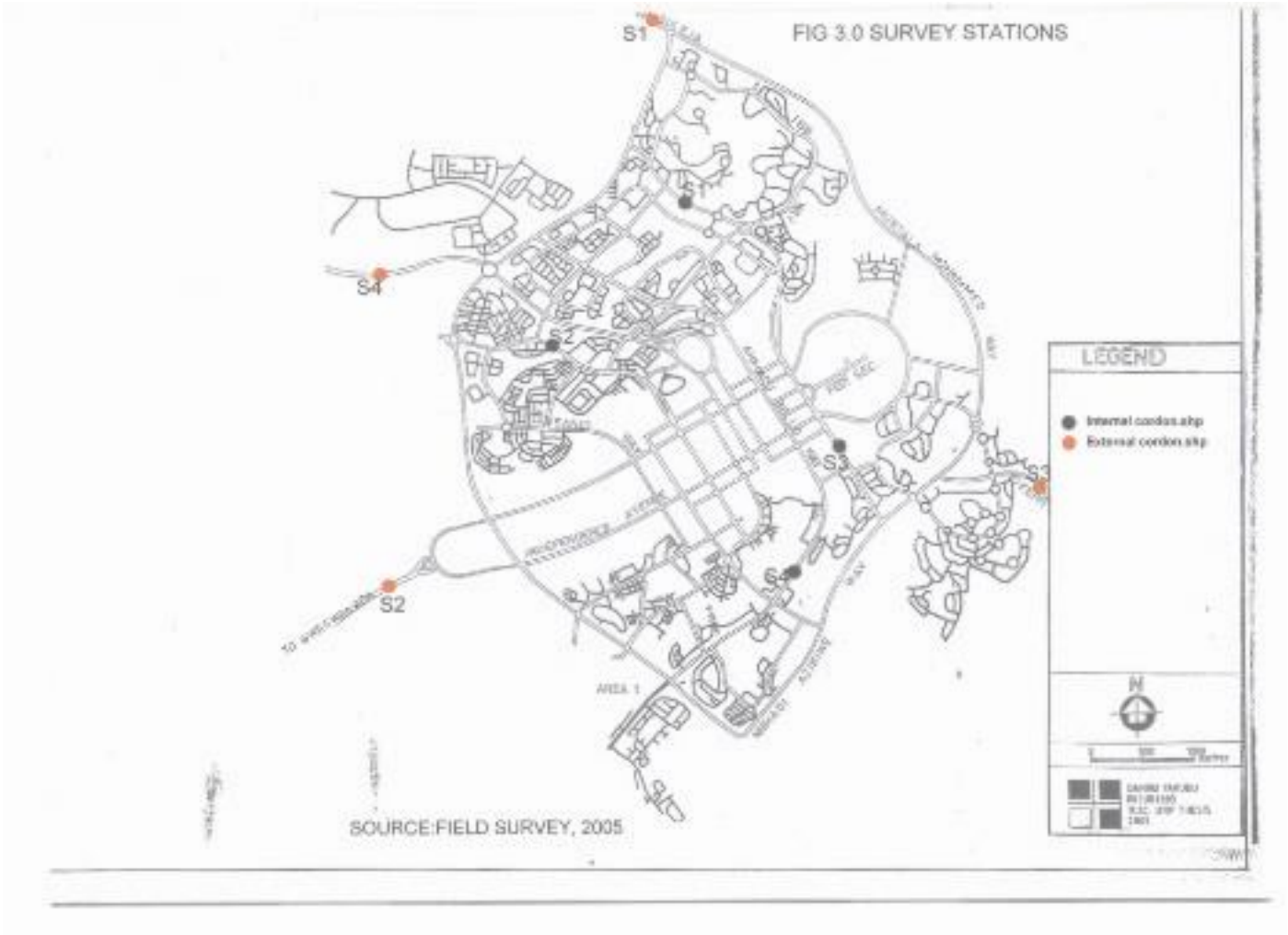
3.3 VOLUMETRIC COUNT OF ALL THE EXISTING TRANSPORT MODES IN F.C.T

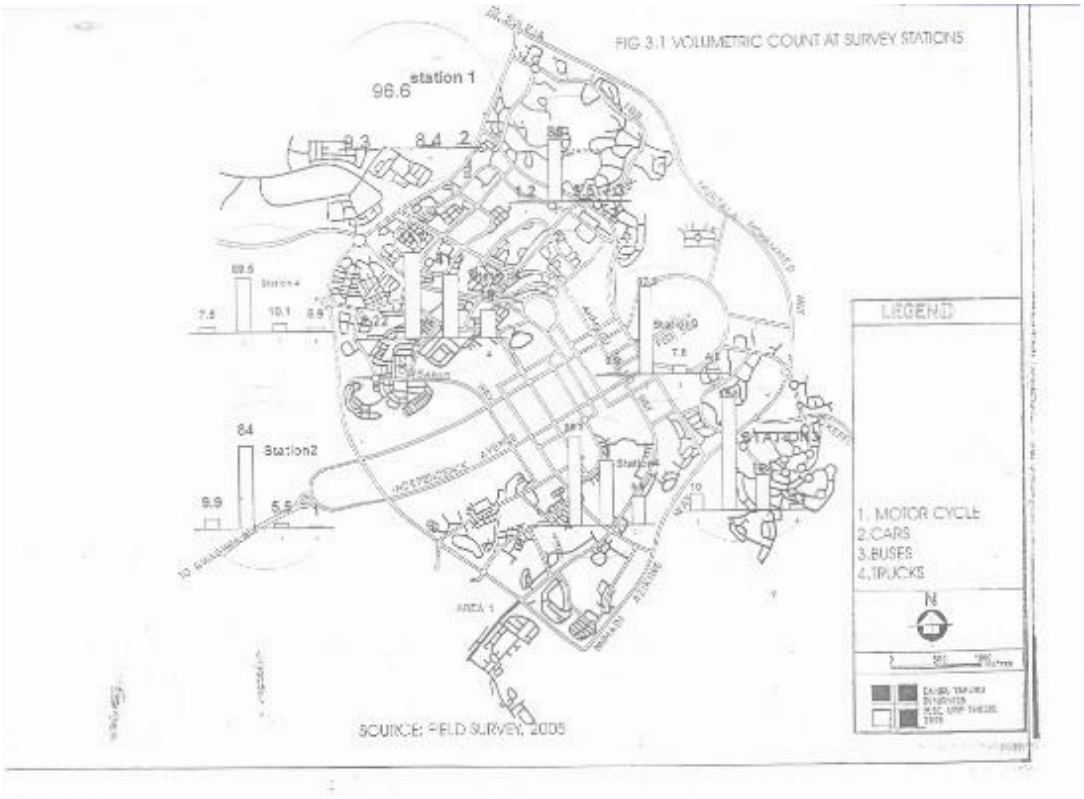
The traffic composition of Abuja is characterized by proliferated un-organized commercial buses, taxis, motorcycles and so many private cars operating in an un-organized manner.

A number of survey stations were identified and traffic count was conducted at various survey stations. The stations are located in both the internal and external routes (see fig. 3.0 location of internal and external traffic count stations).

The period of survey for all the eight stations was 12 hours from 6.30am to 6.30pm for three days. Volumetric count on the eight stations covered all vehicles categorized under four broad groups. (a) Motorcycle (b) cars/taxis (c) Buses (d) Heavy trucks. The passenger car unit (PCU) values of the above four categories of vehicles are 0.75, 1.0, 2.0 and 3.0 respectively (see table 3.1. traffic volumes at survey stations) and (Fig. 3.1. volumetric count at survey station).

The traffic count reveals the following results at each of the survey station as shown in (fig. 3.1).


FIG 3.0 SURVEY STATIONS
S1
S2
S3
S4
S5
S6
LEGEND
Internal cordon ship
External cordon ship
N
SOURCE:FIELD SURVEY, 2005


FIG 3.1 VOLUMETRIC COUNT AT SURVEY STATIONS
station 1
96.6
Station2
84
LEGEND
1. MOTOR CYCLE
2.CARS
3.BUSES
4.TRUCKS
N
SOURCE: FIELD SURVEY, 2005

Summary of Various Modes in External and Internal Routes.

External Routes

Stations	Car	Bus	M/cycle	Truck
1	90.1%	4.7%	3.2%	2.0%
2	85.5%	5.7%	9.9%	0.9%
3	65.8%	20.6%	10.1%	3.5%
4	69.5%	15.1	9.5%	5.9%

Internal Routes

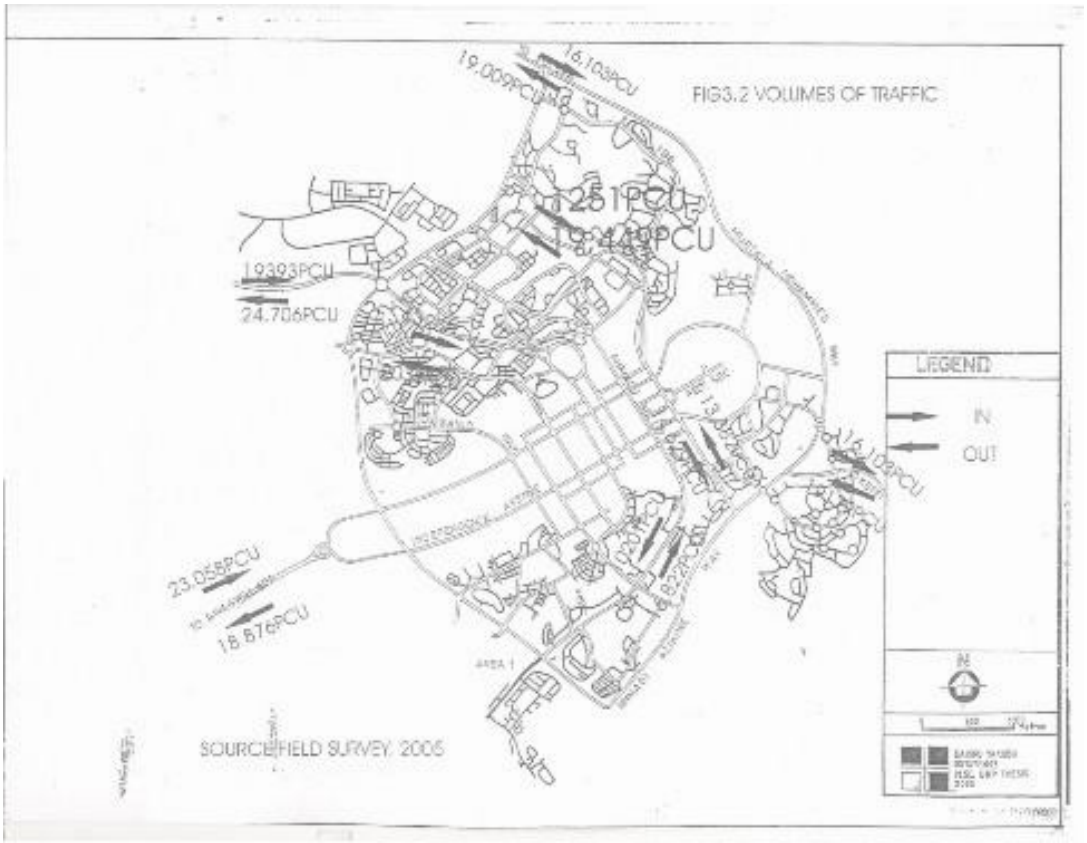
Stations	Car	Bus	M/cycle	Truck
1	88.0%	3.5%	1.2%	7.3%
2	85.7%	41.1%	2.2%	1.0%
3	87.3%	7.8%	0.6%	4.2%
4	85.3%	9.7%	3.6%	1.4%

In all about 70.2% of the entire traffic in the study area are cars, with 15.3% bus, 10.4% motorcycle 4.1%. Trucks.

3.3.1 DIRECTION OF TRAFFIC FLOW IN FCT

A total of eight survey stations are identified as earlier stated and in each both the inn and out flows are counted for all the eight stations in order to identify those routes with greater volume of PCU and on which direction (see fig. 3.2 direction and volume of traffic in each of the survey station) and figure 3.3 desire line showing trip movement and volume of traffic.

Table 3.2 and 3.3 shows the percentage of in and out flow PCU at both the external and internal routes see (table 3.1).


FIG3.2 VOLUMES OF TRAFFIC
19.009PCU
16.103PCU
19393PCU
24.706PCU
23.058PCU
18.876PCU
LEGEND
IN
OUT
SOURCE:FIELD SURVEY, 2005

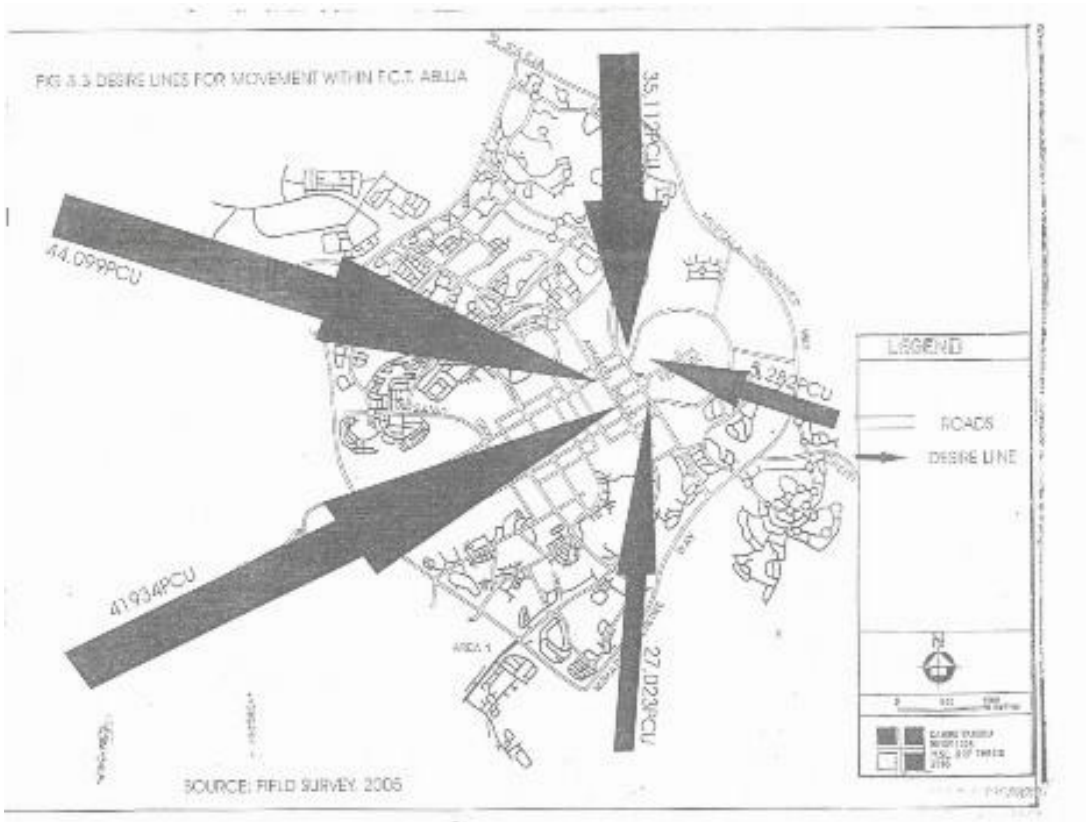

FIG 3.3: DESIRE LINES FOR MOVEMENT WITHIN F.C.T. ABUJA
35,112PCU
44,099PCU
3,282PCU
41934PCU
27,023PCU
LEGEND
ROADS
DESIRE LINE
SOURCE: FIELD SURVEY, 2005

TABLE 3.1: TRAFFIC VOLUME AT SURVEY STATIONS (IN PASSENGER CAR UNIT PCU)

Traffic zones	Direction	Motorcycle	Car	Bus	Trucks	Total
VCl	Inflow	230	10,044	5,053	943	16,270
	Outflow	228	12,998	5,121	832	19,179
	Sub-total	458	23,042	10,174	1,775	35,449
VC2	Inflow	196	21,742	877	243	23,058
	Outflow	205	17,101	1295	280	18.876
	Sub-total	401	38,843	2172	523	41,934
VC3	Inflow	63	12,329	851	303	16,103
	Outflow	58	7,991	861	351	19,009
	Sub-total	121	20,320	1712	654	35,112
VC4	Inflow	589	17,643	911	250	19,393
	Outflow	702	22,611	1,088	305	24,706
	Sub-total	1291	40,254	1999	555	44,099
VC5	Inflow	720	5,799	259	474	7251
	Outflow	530	18,306	335	278	19449
	Sub-total	1250	24,105	694	752	26,700
VC6	Inflow	807	11,069	993	513	13,382
	Outflow	540	13,959	117	14	14,629
	Sub-total	1347	25,028	1110	527	28,011
VC7	Inflow	1,004	15,383	332	103	16,822
	Outflow	98	9,508	450	145	10201
	Sub-total	1102	24,891	782	248	27,023
VC8	Inflow	1,304	2976	2191	58	6529
	Outflow	1,440	9,911	630	57	12,038
	Sub-total	2,744	12,882	2821	115	18,657
GRAND TOTAL		**8,714**	**209,370**	**21364**	**5149**	**256,895**

SOURCE: Field Survey, 2005.

Table 3.2: Traffic flow within External routes

S/no	Station	Inflow PCU	%	Outflow PCU	%	Grand Total	%
1	**Keffi road at A.Y.A. junction**	**16,270**	**54.1**	**19,179**	**45.9**	**35,449**	**22.6**
2	**Airport road by Games village**	**23058**	**55.6**	**18,876**	**44.4**	**41,934**	**26.2**
3	**Kubwa road (before tipper garage)**	**16,103**	**45.8**	**19,9009**	**54.2**	**35,112**	**22.4**
4	**Shehu Musa Yar'adua before Mabushi**	**19,393**	**43.7**	**24,706**	**56.3**	**44,099**	**28.8**
	TOTAL	74824	47.5	81,770	52.5	156,594	60.1

In the external routes station number four, Shehu Musa Yar'adua road before Mabushi round about has the highest PCU of about 28.8% of all the vehicles that move into the city daily, this are people coming from Gwarinpa estate, life camp, Kado estate and some time from Karmo to the city centre. Station number 2 Air Port route PCU in this station commuters are usually coming from Gwagwalada, Air port, Kuje, Lugbe, to the city centre, station number 1 Keffi road at A.Y.A junction has 22.6% of the total volume of the external flow of traffic for commuters coming from Keffi, old Karu, Nyanya to the city centre. The fourth station is that of Kubwa road to the city only 22.4% of the total external traffic patronized

the route. In all the routes only route 1 and 2 has higher percentage of PCU in the inflow which stood at 54.1% and 55.6% respectively, all others recorded more traffic at the out flow direction especially at the close of business or working hours. In all, the out flow PCU is higher than that of the in flow in the external routes 52.5% as against 47.5%. This shows that there are more vehicles moving out of the city at the close of the days work.

Table 3.3: Traffic flow within Internal routes.

S/N	Station	Inflow	%	Outflow PCU	%	G. Total	%
1	Shehu Shagari way Between MTN Junction	7,251	25.9	19,449	74.1	26,700	26.7
2	Herbert Macouley way by (Wuse mkt)	6,529	33.9	12,038	66.1	18,567	19.9
3	Shehu Shagari way between 101&102 junction	13,382	47.7	14,629	52.4	28,011	27.1
4	Ahmadu Bello way between junctions 151 and 519	16,822	61.3	10,201	38.7	27,023	26.3
	TOTAL	**43,984**	**43.7**	**56317**	**56.3**	**100.301**	**39.9**

Source: Field Survey, 2005

ehu Shagari way have the highest volume of traffic of about 27.1% followed by MTN junction along same Shehu Shagari way about 26.7% of the P.C.U. Ahmadu Bello Way is next followed by Herbert Macauley way with only 19.9%. The internal routes generally has less P.C.U. than the external route. The external routes accounted for 60.1% of all the traffic volume in the sampled study. The internal routes though sampled account for only 39.9% of the traffic volume.

3.4 FINDINGS ON TRAFFIC SURVEY ANALYSIS.

The traffic count survey indicates that there is the prevalence of car mode over all other modes in the FCT. Fig. 3.1 shows the percentage of various modes in each of the eight (8) survey stations and in each of the stations the car mode is dominant. In the external routes for instance in station 1. 90% of the vehicles that pass through that route are cars, while in station 2. 85%, station 3, 65% and in station 4, 69.5%. While for the internal route station 1 recorded 88%. Station 2, recorded 55% station3, 87% and station 4, 85%. The car mode accounted for 70.2% of the total vehicle in the study area. All this give a stronger basis for the implementation of the new transport programme. Because they are indices that the Abuja master plan has cautioned earlier on, and that was one of the reasons that lead to the search for new Federal Capital.

Fig. 3.3 Desire line of trips and volume of PCU moving toward the CBD. This can be used in assigning vehicle fleet based on recorded PCU value in each of the routes for the new transport outfits if introduced. The analysis indicates that more of the fleet will be required in the external routes than in the internal routes because the PCU values is higher in the external routes as shown in fig 3.2.

The analysis of both the public and private transport systems in this chapter has shown that the public transport system has failed short in both quality and quantity in providing adequate transport services to the teeming population of the FCT resident. While the activities of the private

car owners, are detrimental to the smooth flow of traffic in the FCT. This gives a clear basis for the transport initiative in the FCT. Although caution need to be taken while implementing the transport programme.

3.4.1 MANAGEMENT AND OPERATIONAL PROBLEMS OF THE ORGANIZED PUBLIC TRANSPORT OPERATORS IN FCT

The public transport operators in the FCT are been faced with so many problems as stated earlier, one of which is lack of enough fleet for full operation especially among the organized operators, because of that, they are only able to provide inter-city services it is only the (AUMTCO) that has very few of its fleet on the intra-city routes. Investigation also indicates that, there are a number of problems which constrain the operators from operating on the intra-city routes, apart from fewer fleet, another reasons are inadequate bus – stops and lay bys. The (AUMTCO) and the (LCMTS) which has high capacity vehicles of about 50 seating capacity complain of inadequate bus stops, lack of enough lay-bys and turning radius on major high ways within the CBD which often creates chaotic traffic situation especially during peak periods.

Other problem associated with most of the existing organized public transport operators in FCT is that of operational cost. A number of the vehicles mentioned above are mostly aged, some of which were purchased as far back as 1990 these aged vehicles certainly constitute a major source of financial drain to most of this transport operators as most

of the revenue generated from operation goes to the maintenance of these vehicles.

The scarcity of fleet often causes overloading of the few available vehicles with some of the passengers standing. This usually attracts the interest of vehicle inspection officers (VIO) and the officials of Federal Road Safety. This hinders smooth operation and causes delays.

It is evidently clear, that the few organized public transport systems operating in FCT can not in any measure meet the mobility requirement of the FCT residents, because of its series of problems. This trend is considered unacceptable by FCTA administration because it is against the provision of the Abuja public transport plan. It is the policy position of the FCTA administration to phase out these public transport operators and to introduce the high capacity mode of transport i.e. a well organized public private transport system that will stand the test of time. This will be done by re-organizing the whole transport sub-sector in the FCT.

3.5 SUMMARY

This chapter highlights on the inefficiency of the present transport systems in providing adequate transport service in FCT. It also shows the dominance of car mode at the detriment of all other modes. This gives basis for the need to introduce high capacity travel modes in order to minimize traffic congestion as envisaged earlier on by the Abuja master plan.

CHAPTER FOUR

ASSESSMENT OF THE ABUJA PUBLIC TRANSPORT INITIATIVE (ABUTRANS)

4.1 INTRODUCTION

This chapter examines the components of the new transport initiative as it relates to bus – mass – transit. It highlight on the requirement of the transport initiative and the expected benefit to be derived if the programme is fully implemented. The chapter also looked at the limitation or negative effects of the transport initiative for the authority to exercise caution while implementing the programme.

4.2 BUS – MASS TRANSIT IN THE ABUJA MASTER PLAN

The Abuja master plan provides that FCT mass – transit system must provide the following.

a. Adequate mobility to persons/residents who do not own cars.

b. Safe and convenient transit to persons who own cars.

The master plan stipulates that, to encourage those who own cars to join transit bus, the bus must be attractive and must also provide the following:-

Comfort - More seats

Safety - Good boarding condition.

Regularity, punctuality, cleanliness and shorter journey times. The master plan also explains that provision of the above listed services may mean higher fares, which the captive riders may not afford. The solution to that problem therefore, is the use of two different types of transit buses. The corridors that harbour more residents with no private cars and densely populated routes like Karmo/Idu or Nyanya need high capacity buses with minimum of 40 seats and maximum of 70. While highly motorized corridors be allocated 53 seats air – conditioned express buses with fewer bus stops. In pursuance of the above objectives the transport secretariat of Federal Capital Territory Administration (FCTA) came out with a proposal on how to re-organize the transport sector as contained in the Abuja master plan, called "The Abuja Public Transport Initiative (Abutrans).

4.3 FEATURE OF (ABUTRANS)

Abutrans is FCT 12 year plan to build and operate rail lines, expand and improve bus service so as to address the mobility needs of Abuja metropolitan area and provide economic stimuli in the region for city growth and development. The project consists of public transport solution to the problem of urban mass-transit condition in the FCT.

Abutrans includes;

- Expanding bus services in all areas to reduce congestion in the city.
- 286km light rail and commuter rail.

- 33,000 park-n-ride spaces at rail and bus station to reduced the use of private cars into the city centre.
- Introduction of the Abuja green cabs scheme to boost the para-transit modes, which will replace the old taxi system presently operating.
- Banning the use of commercial motorcycle in the FCC.

4.4 INAUGURATION OF VARIOUS TRANSPORT SUB – COMMITTEES.

To effectively carry out the transportation programmes a number of sub-committees were inaugurated. These include the following:

- Sub-committee on buses
- Sub-committee on rail ways/transit way
- Sub-committee on the regulation of transport activities.

These committees are to harmonize all efforts made towards improving the transportation sector of the federal capital territory, ensuring that all transport initiative of the FCT are realized. The committee is also to provide gateway for interested local and foreign investors who wish to contribute in providing well-organized, safe and comfortable commuter services at the FCT.

`The primary objectives of the committee are detailed planning and introduction of a robust urban transit system and to oversee the implementation of the green cabs scheme.

The regulatory sub-committee designs a framework and an action plan for transport regulation in FCT. They come out with an action plan called Abutrans initiative.

4.4.1 Mandate of the Bus Sub-committee

The committee is charged with the following:

- To undertake detailed study to develop long-term urban transport plan including identification of bus routes and bus stops.
- Diverse strategy for building bus shelters and stations.
- Diverse strategy for identifying reliable operators addressing inter connectivity issues, fare determination and collection, establishing call centers and
- To explore public-private partnership (PPP) option for infrastructure and service delivery.

4.5 MANDATE OF ASTAC NIG. LTD

In order to achieve its objectives the bus sub-committee through Transport Department of FCTA awarded a contract to M/S ASTAC Nig. Ltd for transportation study in the FCT with the following objectives;

i) To design bus routes and bus tops

ii) To produce routes maps

iii) To produce trip demand analysis

iv) To prepare a draft and final evaluation report

The study is aimed at guiding the FCTA through the transport department to assign bus fleet to each of the proposed bus routes.

4.5.1 Review of ASTAC Report

After a careful study of the M/S ASTAC Nig Ltd report by the regulatory committee on the necessary requirement of the transport programme, the following are agreed as the requirement needed for the transport programme.

a. High capacity buses containing 40 – 53 seaters are expected to be used for intra and inter city service. While buses containing 200 seater are also proposed in some congested external routes.

b. About 169 bus stops are to be constructed within the range of 300m – 500m distance on internal routes while lay bays are also to be constructed on the external routes. This is already on the ground.

c. After passing through a pre-qualification tender analysis and bidding process three different companies emerged as the successful companies to provide transport services in the FCT. M/S ASTAC report proposed both the colour code and the routes for the three different companies see (fig 4.0) proposed bus routes in phase 1.

The following are the companies and their colour codes and location of routes.

1. **Company's name**:- Nation Wide Unity Transport Ltd (NUTL).

Area Coverage: Northern Zone (Both Internal and External Routes).

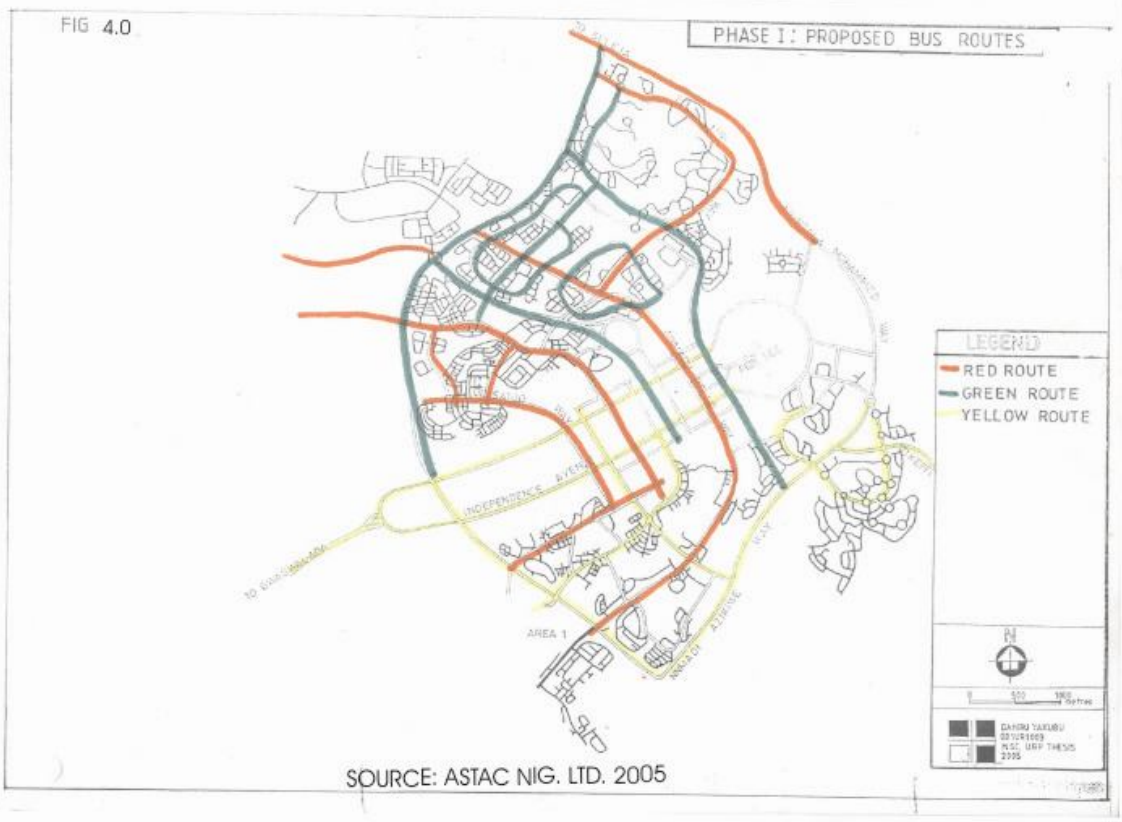
Type of colour: Green colour with three white stripes going diagonally by the side.

2. **Company Name**:- Sonic Global Group.

Area Coverage: Central Zone (Both Internal and External Routes.)

Type of Colour: Yellow colours with three red stripes going diagonally by the side.

FIG 4.0



SOURCE: ASTAC NIG. LTD. 2005

3. **Company Name**: Abuja Urban Mass – Transit Company (AUMTCO)

Area Coverage: Southern Zone (Both Internal and External Routes).

Type of Colour: Red or Maroon colours with three white stripes going diagonally by the side.

The bus routes are also distributed to the companies as follows:-

Table 4.0: Distribution of Bus Routes to Three Operators.

S/No	Operating Zone	Line Colour	Internal Routes	External Routes	Total Routes No.
1	Northern	Green	5	3	8
2	Central	Yellow	2	3	5
3	Southern	Red	7	3	10
	Total		**14**	**9**	**23**

Source: ASTAC Nig. Ltd, 2005.

Table 4.1: Schedules of minimum number of buses per bus routes.

S/NO	Operating Zone	Line Colour	Internal Routes	External Routes	Total Routes No.
1	Northern	Green	60	52	112
2	Central	Yellow	10	46	56
3	Southern	Red	73	25	98
	Total		**143**	**123**	**266**

Source: ASTAC Nig. Ltd, 2005

The above bus route allocation and fleet allocation are aimed at achieving proper connectivity and to provide efficient services to the

559,676 passengers that ply the road in FCT daily to/fro the city, ASTAC reports, 2005.

d. To address the issue of high fares, the studies also proposed transport fares that are bellow the existing fares charged by taxis, buses and commercial motorcycle. The range of fares moves between (twenty naira) N20 only at internal routes up to (two hundred naira) N200 only at external routes so as to attract more passengers. This is approved by the (FCTA).

e. Park – n – Ride stations are also proposed in three major location i.e Airport – Gwagwalada end, Nyanya and Kubwa routes. This is yet to be on the ground as at the time of investigation and report writing.

f. The study also proposed the establishing of call centers and standard workshops in the central area which will serve as a terminal for the operators for maintenance purpose. This is also yet to be on the ground as at the time of investigation and report writing.

4.5.2 Limitations of ASTAC Report

A critical look at the mandate of the bus – sub committee in section 4.41 and the agreed requirement that follows by ASTAC Nig. Ltd. And the (FCTA) Transport Secretariat the regulatory body in section 4.50 of this chapter point to the fact that an important component of the transport programme is left out. That is, the absence of understanding the critical reasons that account for the traffic problems. Will provision of buses alone to take over from the use of private cars as envisaged by the Abuja

master plan means an automatic shift from the use of private car to buses? There is the need to first of all identify those socio – economic as well as travel service characteristics inherent with the FCT resident. What are those factors that determine their present choice of mode and why is the private car mode more dominant in the FCT? All these are central questions that need to be answered before the provision of transport facilities.

4.6 PROGRAMME IMPLEMENTATION

This programme involves the planning, implanting and implementation of a modern urban transport services in Abuja as well as the supply of the vehicles needed. The package will also include the provision of technical know-how for the maintenance and servicing of these vehicles as well as the provision of fleet management expertise for a planned urban transport system.

The programme will be implemented in phases over a period of 6 years, it will involve a consortium of 3 Brazilian companies under the umbrella NEOBUS. Total transfer of management of the system will be done after the 6th year – time considered by experts as enough to have prepared local human resources and to transfer the necessary know-how.

The consortium includes:

- NEOBUS – San Marino Onibus Implementos Ltd: They are bus builders sited in Caxias do sul, Rio Grande do sul, Brazil. Neobus has a plan to establish subsidiary in Nigeria.
- LOGIT Consultoria S/C: They are consultants and logistics planning experts. They will do the planning and implementation of the system as well as implant the internal management system.
- BUSCARD Consultoria and Logisticas: They will supply the know-how material on electronic ticketing and operating technology in the area of mass transit.

  The implementation of the programme is expected to be in two phases. Phases I and II. It is expected that by the end of phase II all the programme will be fully developed.

PHASE I

This phase will be immediate and will involve setting up the garage and workshop facilities and training of drivers and co-drivers. At this stage the first batch of buses will arrive to start operating in the inner core of Abuja (central Abuja) and services the hotels and airport. This phase will be to alleviate the present suffering of the commuters due to lack of adequate transportation. This phase will require about 120 buses of which 100 will be high capacity buses of 40 and above seated passengers. The buses are expected to be low – entry coaches, highly comfortable and fully air – conditioned. The most modern type of buses in the market. The remaining 20 will be executive type of micro – bus to service the airport

and Hotels. In all phases the pre – paid digital ticketing system will be adopted this is because of its advantage particularly in time saving.

PHASE II

During this phase, the Bus Rapid Transit (BRT) will be implanted. These are dedicated bus lanes to service the routes with very high passenger movement. This could replace the metro line project in the master plan of Abuja or at least supplement it before its implantation. This phase is expected to end in the 5th year of the programmes implementation, because the government needs time to convert some of today's current routes to dedicated routes and build stations and bus stops. This phase will require about 70 articulated buses of 100 – 200 seats passenger.

4.7 EXPECTED BENEFITS OF THE TRANSPORT INITIATIVE.

For Abuja, the programme if fully implemented will alleviate the suffering of the Abuja residents. Today transportation system in many Nigeria cities (Abuja is not an exception) are generally unsafe, and expensive. Moreover, Abuja needs a facelift in this aspect in order to maintain its status as the nations new federal capital.

A planned and regular transport system saves the user time and conserves their physical integrity. As the saying goes, "time is money". The economy will benefit because more time will be used for production and leisure. People arrive to their work places in a better physical condition and this in turn reflects positively in better productivity.

For the teeming population of Abuja residents especially the captive riders their auto – esteem is boosted and their acquired right to free movement is respected, the bottom line of all this is a happier society. Transport facilities will be more convenient than before one can catch a bus in every 10 minutes or less during rush hour. Fewer people driving will result to clear air and very good for individual health.

For those employed in the programme their economic power will be boosted and more jobs will continue to be created which will in turn improve the city economy and that of the nation at large.

4.8 PROJECT MANAGEMENT AND FINANCING OPTIONS OF THE NEW TRANSPORT INITIATIVE.

The Abuja transportation problem is severely a practical problem which if miss-managed at the present stage of its development may become intractable and very expensive to correct as the year rolls bye, while space-time and opportunities become more constricted in the future.

It is against this background that (FCTA) proposed that urban transport project financing and management focus should undergo paradigm shift away from government and out of funding of transport project to join public private funding (PPP) and finally to private sector founding of infrastructure under DBFOT, BOT and BOO scheme in a legally Supportive and investment friendly environment.

In this wise, it is the responsibility of the government to provide some basic infrastructures like bus stops, bus terminals, exclusive and dedicated bus lanes etc where necessary. These are parallel projects that the government must pledge to put in place. Other facilities like workshops and garages are expected to be provided also by the government.

Although most of this infrastructural facilities are required to be provided by the government, but are not in place, example is the workshop and the terminals for the bus operators which are not yet in place as at the time of investigation and report writing.

4.8.1 Implications of the New Transport Initiative to FCT Residents.

Transport situation of Abuja needs an overhaul, but there is the need for the authority to exercise caution in the way the programme is implemented, so as to avoid socially aggravated consequences in the society. It is clear that by the time the programme is fully implemented many transport owners will be thrown out of jobs. Most of these people are earning a living through such vehicles, throwing them out will create so many problems in the society. There is the need for government to have a re–think towards that direction. The nature of our urban context, travel behaviors, income and cultural setting has to be considered before implementing any policy.

For the Abuja green cabs the newly introduced taxis, their operational guidelines and fare charges are very high for the common

man to bear. N200 /drop are at the high side. Many people would not afford that price, and may mean making life difficult for the ordinary citizen in Abuja. It also means there will be no option left for the ordinary citizen except the mass – transit buses. With the banning of the present commercial buses, motorcycle and taxis out of the FCC, the next possible option is walking to destination for those that can not afford the green cabs, because the buses are designed to terminate on the major road only.

Caution needs to be taken while implementing the initiative so as to avoid its adverse effect on the people. Already many people are thrown out of jobs and more are going to be thrown out, that will be too much for the society to bear. Abuja city, just like other cities in the world needs the services of the low income groups or the ordinary citizen. Their service is needed and so should not be thrown out.

4.9 SUMMARY

In this chapter emphasis are directed on how to provide enough transport facilities that will be used in the implementation of the programme issues such as connectivity, fleet number, fare charges, vehicle capacity and others are addressed. But one most important aspect that is required to enhance the success of the programme was not highlighted by the bus sub-committee, and so not mentioned as part of the mandate of the committee.

Therefore, to enhance the implementation of the programme there is the need to study the travel behaviours of the FCT resident in order to find out the factors or reasons behind their present choice of travel modes, what are the motivating factors that influence such selections need to be addressed before the introduction of the necessary facilities.

CHAPTER FIVE

DETERMINANTS FOR THE CHOICE OF TRAVEL MODES IN F.C.T.

5.1 INTRODUCTION

Analysis of the existing transport situation carried out in chapter three proves that, there is the prevalence of private cars over other modes in the FCT, this has posed a great danger to the implementation of (Federal Capital Territory Administration (FCTA) Transport initiative and it is against the initial transport plan of the FCT.

This chapter examined the various reasons behind the choice of travel mode in the study area. This is to enhance the implementation of the new transport initiative. The chapter critically examines the factors that are responsible for such trend. It analyzes the relationship between different variable against the choice of Transport modes.

In order to examine this objective various statistical tools have been used such as descriptive analysis is used to describe the socio-economic characteristic of the respondents where mean and percentages are used. Analysis of variance using (chi-square) is used to test the differences in each categories of the variables to see how it affects the choice of modes. Furthermore, correlation technique has been used to establish the determinants at 99% significant level. Finally cross tabulation analysis is used to analyze the major determinants against various travel modes.

For easy identification of the major determinants, the questionnaire in this study is structured into three sections i.e. socio-economic characteristic, Household information or characteristic and information about Travel service characteristics.

5.2 SOCIO-ECONOMIC CHARACTERISTIC

Table 5.1 - Socio-economic data of Respondents

Categories	%	Categories	%
Gender (n = 202)		Position in the household (n = 201)	
Male	80	Head	70
Female	20	Wife	13
Total	*100*	Son	13
		Daughter	1
Age (n = 201)		Other relative	1
16 – 25	4	Family friend	2
21 – 25	11	*Total*	*100*
25 – 30	17		
31 – 40	47	Empolyment status (n = 181)	
41- 50	21	Full-time	97
51-60	1	Part-time	3
Total	*100*	*Total*	*100*
Nature of work (n = 202)		Location and residence (n = 109)	
Administration	22	Kubwa	17
Professional	48	Life camp	58
Teaching	6	Area 1	12
Clerical Officer	4	Gwagwalada	14
Messenger	10	*Total*	*100*
Others	11		
Total	*100*		
Level of education (n = 200)		Work place (n = 132)	
Primary	6	Area	33
Secondary	7	Central Area	49
Tertiary	88	Wuse	19
Total	*100*	*Total*	*100*
Marital status (n = 202)		Number of children btw 3 - 15 (n = 202)	
Single	35	None	28
Married	65	1 – 4	60
Total	*100*	5 – 8	11
		Above 8	1
		Total	*100*

Table 5.1 Reveals that the total number of respondents are 202 (two hundred and two) out of which 80% are male, 20% female. About 47% of the respondents are aged between 31-40yrs and 48% of them are professional in various fields. Out of (202) people that responded 88% of them attained tertiary education with only 6% primary school certificate holders.

The study also reveals that 56.5% of the people in the sampled survey are married with children that are within Nursery, Primary and Secondary School age of 3 – 5yrs. The analysis shows that about 71% of this children are aged between 1 – 8yrs which is the school age level that needs the assistance of their parents to go to school daily. In respect of place of work about 49% of the respondents has their offices at the Central Area of the city; this shows why traffic is high in the Central Area. (See Table 5.1)

5.2.1 Household Characteristic

This section examines the number of people in a household, both working and those that are not, and their average monthly earnings. Other information analyzed in this section includes number of cars in a household and weekly expenditure on fuel and other household data. (See table 5.2 Household characteristic of respondents).

Table 5.2 - Household Characteristic of Respondents

Categories	%	Categories	%
No. of people in household (n = 202)		No. of vehicles in use (n = 201)	
0 – 4	34	None	26
5 – 10	56	1 – 3	71
11 – 15	7	4 – 6	2
Above 15	3	Above 6	1
Total	*100*	*Total*	*100*
No. Working in household (n = 198)		**Weekly expenditure on fuel (n = 140)**	
None	19	N2,000	44
1 – 3	70	N4,000	17
4 – 6	7	N5,000	17
Above 6	4	N6,000	8
Total	*100*	Above N6,000	14
		Total	*100*
No. that drive in household (n = 198)		**Other Travel mode aside cars (n = 186)**	
None	18	Bus	43
1 – 3	70	Motorcycle	19
4 – 6	8	Taxi	39
Above 6	4	*Total*	*100*
Total	*100*		
Average monthly earnings (n = 187)		**Time spent going to work (n = 186)**	
N10,000 - N19,999	29	0 - 5min	1
N20,000 - N29,999	30	6 - 10min	9
N30,000 - N39,999	19	11 - 15min	5
N40,000 - N49,000	9	15 - 20min	32
N50,000 - N59,999	6	above 30min	54
N60,000 - N69,999	5	*Total*	*100*
N80,000 - N89,999	1		
Above N90,000	1	**Time leaving for work (n = 179)**	
Total	*100*	6:00 - 6:30	9
		6:31 - 7:00	13
Transportation mode (n = 201)		7:01 - 7:30	32
Car	47	7:31 - 8:00	42
Foot	3	8:01 - 8:30	5
Bus	31	*Total*	*100*
Taxi	11		
Bicycle	1		
Motorcycle	7		
Total	*100*		

Table 5.2 above shows that 56% of the houses sampled has between 5 – 10 people in a household and 70% of them has between 1 – 3 people working in one household. 30% of the respondents earns between N20, 000 – N29, 999 with only 1% earning above N90, 000. The dominant travel mode in the sample area is the use of private car with 47% of the people using car as the major traveling mode followed by bus. This must have accounted for the reason why there are more cars on the street than other modes. While the major alternative mode used apart from car is the bus, which accounts for about 43%. And 71% has between 1 – 3 vehicles in their houses. The predominant time people leave for work is between 7:30 – 8:00am, 42% of the people attests to this fact in the study area. That is why traffic congestion is at it peak moments during such time.

5.2.2 Travel And Transport Data or Travel Characteristics

The transport services characteristics, that are linked to travel modes are analyzed in this section. Example of the public mode in used at present and its associated problems are also examined. Travel time, waiting time and distance to bus stop are the variables that form part of this section.

Table 5.3 - Travel and transport data of Respondents

Categories	%	Categories	%
Public mode of transport available (n = 201)		**Distance of bus stop to house (n = 196)**	
Bus Service	39	Less than 0.5km	41
Taxi	34	0.5 - 1km	19
Motorcycle	23	1 – 2km	18
Others	4	2 – 3km	10
Total	***100***	3 – 4km	6
		Above 5km	6
		Total	***100***
Distance of workplace to bus stop (n = 192)		**Time spent waiting for vehicle (n = 195)**	
less than 0.5km	37	5 - 10mins	43
0.5 - 1km	21	11 - 15 mins	27
1 - 2km	15	16 - 20 mins	9
2 - 3km	2	21 - 25 mins	3
above 3km	25	26 - 30 mins	11
Total	***100***	Above 30 min	8
		Total	***100***
Inconveniences in public bus (n = 195)		**Will patronise if condition change (n = 181)**	
High fare	16	Yes	88
Bus stop too far	3	No	12
Long wait for bus	23	Total	100
No shelter at Bus stop	13		
Transfer btw vehicles	19	**Easy to pack car within city (n = 163)**	
Overcrowding & rush	14	yes	33
Inside bus Unpleasing	5	no	68
Others	7	***Total***	***100***
Total	***100***		
Car ownership threat to parking (n = 174)		**Support for parking regulation (n = 183)**	
Yes	64	Tax or fee	22
No	36	Subsidized bus service	68
Total	***100***	Walking & biking	4
		Others	6
		Total	***100***

Table 5.3 Reveals that 39% of the respondents says that, the bus mode is mostly available to them more than any other modes. While 34% says that out of all the public transport modes, it is the taxi that is available to them than other modes. 23% says, it is only motorcycles that is available around their areas. In responding to a question about the distance between working place to the next bus stop 37% says it is less than 1/2km, while 21% says it is between ½ - 1km. In an attempt to find out the inconveniences associated with the present public transport, 23% says long waiting at bus stop; another 19% says she or he dislikes transferring between vehicles. 16% complains about high fare associated with present public transport services.

5.2.3 Aggregate Mean Value From Sample

Table 5.4 shows all the questions that are asked in the questionnaire and the mean value as well as the standard deviation. It summarizes the result of all the responses in the questionnaire.

Table 5.4 - Aggregate Mean Value of Responses from Sample

Description of Variables	Mean	Std. Deviation	Aggregate response
Gender	1.20	0.399	Male
Age	3.71	1.059	31 - 40
Nature of work	2.65	1.636	Professional
Level of education	4.82	0.509	Tertiary
Marital status	1.65	0.479	Married
Position in the household	1.54	0.995	Husband
Employment status	1.03	0.180	Full-time
Where do you leave	2.23	0.889	Life camp
Where do you work	1.86	0.707	Central Area
No. of children btw 3 – 15	2.14	2.101	2
No. of people leaving in household	6.24	3.542	6
No. of people working	1.82	1.636	2
No. of people that can drive	1.95	1.733	2
Average monthly earnings	2.57	1.613	N20,000 - 29,999
Transportation mode	2.37	1.518	Bus
No. of vehicles available for use	1.16	1.135	1
Weekly expenditure on fuel	2.32	1.456	N4,000
Travel mode aside private cars	1.96	0.911	Motorcycle
Time it takes to go to work	4.31	0.946	15 - 20min
what time do you go to work	7.43	0.587	7:43
Public mode of transport available	1.91	0.869	Taxi
Distance to bus stop from house	2.38	1.529	0.5 - 1km
Distance of workplace to bus stop	2.56	1.591	1 - 2km
How long do you wait for vehicle	2.34	1.649	11 - 15min
Inconveniences in public buses	4.37	2.366	Too long to wait
Will patronize if condition change	1.12	0.328	Yes
Ease of parking car within the city	1.67	0.470	Yes
Car ownership threatens parking	1.36	0.482	Yes
Support for parking regulation	1.95	0.739	Subsidized bus

5.3 ANALYSIS OF VARIANCE FOR TRANSPORTATION MODE BASED ON THE STUDY (CHI-SQUARE TEST)

One of the objectives of the study is to identify these determinants based on the sample data collected in the study area.

Table 5.5 shows the analysis of variance conducted on each of these factors to test for differences in categories of each variable (factor) in respects of transportation mode.

Table 5.5 - Analysis of Variance For Transportation mode based on study variables

Study Variables	Sum of Squares	df	Mean Square	F	Sig.
Gender	0.60	1	0.604	0.261	0.610
Age	35.57	5	7.113	3.258	0.004
Nature of work	44.58	5	8.916	4.167	0.001
Level of education	31.32	2	15.661	7.152	0.001
Marital status	22.77	1	22.768	10.344	0.002
Position in the household	21.19	5	4.238	1.879	0.100
Empolyment status	40.71	1	40.713	18.411	0.000
Where do you leave	31.11	3	10.368	4.304	0.003
Where do you work	19.10	2	9.551	4.911	0.009
No. of children btw 3 – 15	64.49	9	7.166	3.454	0.001
No. of people leaving in household	140.36	15	9.357	5.403	0.000
No. of people working	52.29	8	6.536	3.122	0.002
No. of people that can drive	84.32	8	10.540	5.480	0.000
Average monthly earnings	135.56	7	19.366	11.333	0.000
No. of vehicles available for use	155.49	5	31.097	19.864	0.006
Weekly expenditure on fuel	30.96	4	7.739	5.373	0.010

If significant less than 0.05 then there exist a significant difference among the variables under investigation.

This means that transportation mode is affected by the change in category in variables.

From the table, out of the household variables (17 in all) 11 of them exhibit significant differences between the categories in each variable in terms of the choice of traveling mode. Amongst these variables are Age (P value = 0.000). Nature of work (P-value = 0.001) Level of education (P-value =0.001), marital status (P-value =0.002), Employment status (P-value 0.000), location of house (P-value 0.007), place of work (P-value 0.009) Number of children between 3-15yrs (P-value 0.001), No. of people working in a household (P-value 0.002), number of people capable of driving a car in a household (P-value 0.000), average monthly earnings (P-value 0.000).

While the remaining 2 variables i.e. Gender and position in the household show, (P-value of 0.610) and (0.100) respectively. These P-values are >0.05 which also means that none of the categories of these two variables influence or affect the choice of travel mode in the study area.

5.3.1 Socio-Economic Variables That Affects Travel Mode

Age: (P-value 0.004)

Age is categorized in about 6 categories in the sample (see table 5.1), the dominant age group is those at the age between 31-40yrs which constitute 47%. The study from the result of the (P – value) shows that Age groups affects choice of travel mode. Just as (Adams, 1994) pointed out.

Nature of work (P-value 0.001):

These are categorized as administration, professional, teaching, clerical office, messenger and others (Table 5.1). The study also shows that travel mode choice is affected by these classifications of work in the study area. It means that some certain occupations choose a different mode from what others chooses.

Level of Education (P-value 0.001)

Level of education is categorized as primary school, secondary and tertiary. 88% attained tertiary education. This also means that there is a difference between the type of modes used by those that attained tertiary education from those that attained primary or secondary school.

Marital Status (P-value 0.002)

Marital status is categorized as married and single. 65% married as against 35% single in the sample. The study reveals that significant difference exists in the type of mode choosing between the married and the single families in the study area.

Employment Status (P-value 0.000)

Employment status is categorized as full-time or part-time. From the sample 97% falls within full-time workers while only 3% falls within part-time workers. This also shows that the full time workers use a different mode from the one used by the part-time workers.

Location of residential area (P-value 0.003)

Samples where collected from Gwagwalada, Kubwa, Nyanya and some parts of the city centre. But 58% of the respondents comes from area within the city centre. The study reveals that residential location has influenced the type of modes individual chooses in the area. This is true because people that reside in the city centre might just pick taxi, bus motorcycle or even go on foot to work. While people coming from Gwagwalada Kubwa might decide to use their cars or use the public bus.

Number of children between 3-15yrs (P-value 0.001)

Number of children is categorized in the sample as the next to those that have 1-4 children within 3-15yrs, 5-8, above 8 children. The result shows that those that have between 1-4 children are 60%. This has influenced the type of mode individual use in the study area. Some people might decide to uses their cars to pick and drop these children in the school while others use the school bus or public transport for that purpose.

Number of people leaving in household (P-value 0.000)

This is categorized in-groups of (four) 4 namely 0-4 persons, 5-10 persons, 11-15, above 15yrs. The study shows that 58% have between 5-10 people in their house while only 7% has between 11-15 with 3% having above 15 people. Residential density has been seen to have affected the

mode of choice (Maxwell, 1996). The higher the residential density the more the use of public modes while the lower the residential density the more the use of private modes.

Number of people working (P-value 0.002)

About 70% has between 1-3 people working in their houses in the study area. This affects the choice of travel mode. Because some might decide to take private car while others might use different modes that are available.

Number of people capable of driving (P-value 0.000)

70% of the houses has between 1-3 people that can drive a car. This will also affect the choice of mode in the sense that more people have high tendency of driving a car than few people. The study shows that this factor is significant in the choice of travel mode in the study area.

Average monthly earnings (P-value 0.000)

Earning with highest responses in the sample survey is that of the group that earns between N20,000 – N29,999, people in this group constitute 30%. (Adeniyi, 1987) states that one of the greatest influence of mode of choice is the income of the trip maker. This coincides with the finding made by Adeniyi. Income affects choice of mode in the study area as shown by the (P-value of 0.000) which shows significant influence.

5.4 ANALYSIS OF VARIANCE (CHI-SQUARE TEST) FOR TRAVEL SERVICES CHARACTERISTICS BASED ON STUDY

Other factors that have also been identified to affect travel mode choice are those of the travel services characteristics (Abdu, 1995). Various mode choice studies tend to indicate that any mode with less travel time for example has the highest percentage of patronage.

Table 5.6 - Analysis of Variance for travel service and choice of travel mode based on the study

	Sum of squares	df	means square	F.	Sig
Travel mode aside private cars	11.62	2	5.811	2.453	0.089
Travel time	50.33	4	12.582	5.780	0.000
Time leaving for work	86.72	16	5.420	2.557	0.001
Public mode of transport available	11.15	3	3.717	1.621	0.186
Distance to bus stop from house	40.02	5	8.005	3.681	0.003
Distance of workplace to bus stop	13.87	4	3.467	1.720	0.147
How long do you wait for vehicle	18.27	5	3.655	1.562	0.173
Inconveniences in public buses	35.91	7	5.131	2.260	0.031
Will patronize if condition change	20.62	1	20.622	8.803	0.127
Ease of parking car within the city	0.98	1	0.982	0.489	0.486
Car ownership threatens parking	4.09	1	4.094	1.659	0.199
Support for parking regulation	10.17	4	2.542	1.071	0.372

If significant less than 0.05 then there exist a significant difference among the variables under investigation. This means that transportation mode is affected by the change in category in variables.

Table 5.6 shows that out of the (12) twelve-travel service characteristic only (4) four of them affect choice of travel modes in the study area, this includes travel time to work (travel time)(P-value 0.000). Time living for work (P-value 0.001). Distance from bus stop to house (P-value 0.003) inconveniences in public buses (P=0.031).

Other, such as travel mode apart from private car, availability of public mode, distance of work place to bus stop, Ease of parking car within the city, car ownership threatens parking and support for parking regulation does not affect modal choice in the area. See (Table 5.6) they all exhibit P-value above (0.05), which means they are not significant at all.

However, those variables that are significant in affecting travel mode choice amongst the travel service variables are further explained in this section.

Travel time to work (P-value 0.000)

This factor has been identified in the study to have affected travel mode choice. This coincides with what (Abdu, 1995), asserts where he said "various mode choice studies tend to indicate that any mode with less travel time has the highest parcentage of patronage in this study (p-value of 0.00) shows that the variables are significant in affecting mode choice.

Time leaving for work (P-value 0.001)

This also has a significant influence in the choice of mode in this study. The time an individual lives for work certainly determines what mode he chooses to work. Those that work in the night, might take the staff bus or public modes, while those that go to work in the day time might decide to go by private cars.

Distance to bus stop from house (P-value 0.003)

This factor certainly will affect the choice of a person's mode especially the car owners. If the distance is so far away one might decide to go by his private car if he considers the trouble of trecking to the bus stop. While for the captive rider he might decide to take any available means at his disposal.

Inconveniences in public buses (P-value 0.003)

This factor can be seen as a behavioural factor as identified by (Gunn, 2000). The ways people behave in public buses i.e using abusive language and reckless driving affect a person's choice of mode. It could be also viewed as an attitudinal factor as identified by (Ogunsaya, 1988) where he states that "attitude is a mental state of readiness, organized through previous experience, attitudes, includes opinions, believe and feeling". This means that, a person's choice of mode especially the public bus might be negative if he has the experience on how inconvenient it is to go by bus. He might decide to change his mode or he might not want to mingle with opposite sex, that is a cultural factor, which can also be viewed under attitude. All this help to affect choice of travel mode in the study area, there by confirming the studies conducted by (Gunn, 2000) and (Ogunsanya, 1988). The attitudinal and behavioural factors are viewed in this study as inconveniences emanating from the use of public bus as a travel mode.

The above social economic and travel service characteristics need to be enhanced.

5.4.1 TRAVEL MODE DETERMINANTS IN THE STUDY AREA

Having identified the factors that affect modal choice as shown in Table 5.5 and 5.6, those factors that serve as determinants to the various travel characteristics are further established using correlation and whose (r-values) are significant at 99% as shown in Table 5.7 correlation Table is considered as the major determinant.

However, the low values which suggests weak relationship among the variable may not be un-connected to the multicollinearity which has been established to exist among socio-economic variables when used in linear function.

Table 5.7 shows that five variables were identified as the major determinants of modal choice in the study area namely:-

a- Level of education (r = .257)

b- Marital status (r = -.222)

c- Employment status (r = .306)

d- Residential location (r = .324)

e- Average monthly income (r = -.442)

In order to examine the above determinants cross tabulation analysis was used to see how each categories in the determinants affects different modes in the study area.

a) *LEVEL OF EDUCATION*

Table 5.8 – Crosstab of Level of Education and Transportation mode

Determinant Categories	Response Variable Categories						Total
	Car	Foot	Bus	Taxi	Bicycle	Motorcycle	
Primary	2		4	2		3	11
	18.18		36.36	18.18		27.27	100.00
Secondary	1	2	4	7			14
	7.14	14.29	28.57	50.00			100.00
Tertiary	92	1	55	13	2	11	174
	52.87	0.57	31.61	7.47	1.15	6.32	100.00
Total	95	3	63	22	2	14	199
	47.74	1.51	31.66	11.06	1.01	7.04	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages

Source: field survey 2005

Table 5.8 shows that the higher the level of education of people in the study area the more they tend to use car as travel mode. Example, those that have only primary school education 18.18% of them use private cars. The figure increase to 52.87% for those that have attained tertiary

institution, while for choosing foot 0.57% of those at the tertiary groups travel with foot, but 14% of those with secondary school education uses foot as travel mode. While for the choice of bus mode about 36% of those with primary schools education uses the bus as against 28.57% amongst the secondary school certificate holders. 50% of the secondary school certificate holders choose to use the taxis and that is the highest groups followed by 18.18%, which are those with primary certificate. To carefully address this issues, especially those at the tertiary groups, little needs to be done, so as to attract them to use the mass-transit. Already 31.61% of them goes by bus presently as against 52.98% that uses car.

b) ***MARITAL STATUS***

Table 5.9- Crosstab of Marital Status and Transportation mode

Determinant Categories	Response Variable Categories						Total
	Car	Foot	Bus	Taxi	Bicycle	Motorcycle	
Single	23	5	19	14	2	7	70
	32.86	7.14	27.14	20.00	2.86	10.00	100.00
Married	72		44	8		7	131
	54.96		33.59	6.11		5.34	100.00
Total	95	5	63	22	2	14	201
	47.26	2.49	31.34	10.95	1.00	6.97	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages

Source: field survey 2005

Table 5.9 shows that martial status is a significant factor in the choice of travel mode in FCT. The study shows that 54.96% of the married families choose the car as their travel mode while for the single families 32.86% of them also choose private car as their travel mode. None of the married families goes on foot and only 7% among the single families uses foot. The married families goes on bus more than the single in the study 33.39% as against 27.14%. More of the

single families use taxi and commercial motorcycle in the study area. Already the study shows that about 3% of married families goes by bus, it means that if the bus services are improved, more of them will choose it.

c) *EMPLOYMENT STATUS*

Table 5.10- Crosstab of Employment Status and Transportation mode

Determinant Categories	Response Variable Categories						Total
	Car	Foot	Bus	Taxi	Bicycle	Motorcycle	
Full-time	83	3	54	22	2	10	174
	47.70	1.72	31.03	12.64	1.15	5.75	100.00
Part-time			2			4	6
			33.33			66.67	100.00
Total	83	3	56	22	2	14	180
	46.11	1.67	31.11	12.22	1.11	7.78	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages

Source: field survey 2005

Table 5.10 shows that employment status of individuals in the study area determines their choice of mode. The study shows that 47.70% of those full-time employees uses car while none of the part-time employee uses car. 33.33% of those part-time employees choose bus and also another 31.03% of the full-time employees choose the bus. The study in the table shows that more of cars, buses and taxis are used by the full-time employees. While 66.6% of those part-time workers choose motorcycle as travel mode. In order to enhance the programme, greater emphasis should be placed on the full-time employees. They should be encouraged to drop their cars and to

reduce the use of their cars while, the part-time workers that use commercial motorcycle should be discouraged by the commercial motorcycle to patronized the bus.

The best way to do this is to improve the condition of these buses in order to attract the full-time employees to use it by increasing reliability, comfort, and connectivity. Another factor that is associated to this is income level. The full-time employees earn more than the part-time and that is why they are able to afford the car. In this wise, traffic restrain measures need to be introduced. Banning of commercial motorcycle on the other hand will also discouraged the part-time employees from using commercial motorcycle and changes their travel mode to that of bus.

d) ***RESIDENTIAL LOCATION***

Table 5.11: Location of resident and transportation mode to the city.

Determinant categories	**Response variables categories**				
	Car	**Bus**	**M/cycle**	**Taxi**	**Total**
	15	7		4	26
Kubwa	40.00	30.50		19.50	100.00
	32	16	1	7	56
City centre	50.00	20.10	19.40	14.50	100.00
	20	18		5	43
Nyanya	55.10	32.50		12.40	100.00
	21	7	3	11	52
G/Lada	60.30	20.10	5.50	24.10	100.00
	88	48	4	27	177
Total	**49.80**	**30.50**	**0.90**	**18.80**	**100.00**

Upper figures indicate number of responses while the Lower figure indicate percentages

Source: field survey 2005

Table 5.11 shows various modes used against the location of the sample area. The car mode constitutes about 49.80% followed by the bus mode 30.58%. The table also shows that people coming from Gwagwalada have the highest number of car, 60.30% this could be due to the distance and the number of villages and towns on that route. 50.00% of the respondents in the city centre also uses car. On Nyanya route however, 55.10% uses car to work. This result corresponds with the result of the traffic court survey conducted in chapter three of this study where the summary shows the dominant of car mode over all other modes.

For the bus mode, Nyanya route has the highest 32.50%, while 30.50% uses bus on Kubwa road. Because of the distance and the risk that is involved in using commercial motorcyclist, only 0.90% of the respondents uses that mode on all the routes but it has a higher percentage of 14.50% in the areas within the city centre.

This information is vital in the provision of some facilities such as the park-n-ride station; the capacity can be ascertained using this information because it will give an idea about the number of the vehicle to be planned for. This information can equally assist in fleet assigning and many other traffic control measures that can enhance the implementation of the transport initiative.

e) *AVERAGE MONTHLY INCOME AND TRANSPORTATION MODE*:

Table 5.12 - Crosstab of Average monthly income and Transportation mode

Determinant Categories	Response Variable Categories						Total
	Car	Foot	Bus	Taxi	Bicycle	Motorcycle	
N10,000 - N19,999	8	3	12	17	2	12	54
	14.81	5.56	22.22	31.48	3.70	22.22	100.00
N20,000 - N29,999	26		26	4			56
	46.43		46.43	7.14			100.00
N30,000 - N39,999	20		15				35
	57.14		42.86				100.00
N40,000 - N49,000	10		6	1			17
	58.82		35.29	5.88			100.00
N50,000 - N59,999	9	//////	1			2	12
	75.00		8.33			16.67	100.00
N60,000 - N69,999	9						9
	100.00						100.00
N80,000 - N89,999	1						1
	100.00						100.00
Above N90,000	2						2
	100.00						100.00
Total	85	3	60	22	2	14	186
	45.70	1.61	32.26	11.83	1.08	7.53	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages

Source: field survey 2005

Average monthly income in the study is seen to have a significant influence in favour of car mode. The higher the income of individual the more he tends to use the car and the less he tends to use other modes i.e. bus, taxi and commercial motorcycle. See (table 5.12) for people that earn N20, 000 – N29,999, 26% of them choose car and the figure increase to 57.14%, 58.82%, 75% and 100% as the income increases to above

N90,000. This is a strong factor in the choice of travel mode in the study area. While for the bus mode, ironically, it increases from 22% to 46% and then drops to 35% and 1% for those that earn between N50,000 – N59,999. For the taxis and motorcycles, the figure is higher among those in the lower and middle income earning groups. For example, 31.48% of those that earn between N10,000 – N19,999 which is the lowest uses the taxi, another 22.22% of them also uses the commercial motorcycle. Only 5.8% of those in the middle earning groups of N40, 000 – N49,999 chooses to use taxi.

In this respect, the transport department of FCTA should address issues that will encouraged the high-income earners to use the new mass-transit, just as it is practiced in the developed society.

5.5 DETERMINANTS THAT AFFECTS TRAVEL SERVES CHARACTERISTICS IN F.C.T.

The following socio-economic variables affect travel service characteristic in the study area.

Cross-tabulating analysis has been used to explain various socio-economic variables that affect travel service characteristics, which in turn determines mode choice in the study area. This could be used to enhance those service characteristics for improving the implementation of the transport initiative. The following are the socio-economic characteristics and the corresponding travel service characteristics that

are affected as shown in table 5.7 correlations of respondents travel service characteristic and house hold variables.

a. Time leaving for work

b. Distance of bus stop to house - Gender

c. Waiting time { Gender / Nature of work

d. Inconveniences.

a) Time leaving for work is affected by gender and nature of work

Gender and time leaving for work

Table 5.13 - CrossTab of Gender and Time Leaving for Work

Determinant Categories	Response Variable Categories					Total
	6:00 - 6:30	6:31 - 7:00	7:01 - 7:30	7:31 - 8:00	8:01 - 8:30	
Male	15	23	50	65	4	157
	9.55	14.65	31.85	41.40	2.55	100.00
Female	0	0	7	19	5	31
	0.00	0.00	22.58	61.29	16.13	100.00
Total	15	23	57	84	9	188
	7.98	12.23	30.32	44.68	4.79	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages

Source: field survey 2005

Table 5.13 shows that 41.40% of male leave for work at the hours between 7:01-8:00am while 61.29% of female leave for work about the same time. This can be used to show the peak period in the morning hours.

The analysis further reveals that higher percentage of female leaves for work by 7.31-8.00am. While higher percentage of the male leaves earlier within the hours of 7:01am – 7:30. About 31.85% male against

22.58% female. In general the analysis shows that the peak period is between 7.00am – 8.00am in the study area.

b) Nature of work affecting time leaving for work

Table 5.14 - CrossTab of Nature of Work and Time Leaving for Work

Determinant Categories	Response Variable Categories					Total
	6:00 - 6:30	6:31 - 7:00	7:01 - 7:30	7:31 - 8:00	8:01 - 8:30	
Administration	11	5	9	14	4	43
	25.58	11.63	20.93	32.56	9.30	100.00
Professional	3	12	33	36	4	88
	3.41	13.64	37.50	40.91	4.55	100.00
Teaching	1	1	7	1	1	11
	9.09	9.09	63.64	9.09	9.09	100.00
Clerical Officer	0	1	3	4	0	8
	0.00	12.50	37.50	50.00	0.00	100.00
Messenger	0	1	4	8	0	13
	0.00	7.69	30.77	61.54	0.00	100.00
Others	0	3	1	12	2	18
	0.00	16.67	5.56	66.67	11.11	100.00
Total	15	23	57	75	11	181
	8.29	12.71	31.49	41.44	6.08	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages
Source: field survey 2005

Table 5.14 shows that there is a relationship between categories of occupation and time that people leave for work. It is shown in the table that category of the self employed or business people has the highest number of percentage, about 66% of them leave for business at the hours between 7:31-8:00am. The next groups are the messengers in offices they also leave by 7:31 – 8:00am. All the categories of occupation that responded to this question have higher percentage of people leaving to work place by 7.31-8.00am, this justifies the information in table 5.13 that

7:31-8:00am is the peak period in the study area. This will give an idea about the traffic situation and it will provide the needed information to the transport department in coming out with policy that will reduce traffic congestion at peak period.

c) Distance to bus stop from house affects gender

Table 5.15 - CrossTab of Gender to Distance of bus stop to House

Determinant Categories	Response variable categories						Total
	0 - 0.5km	0.5 – 1km	1 – 2km	2 - 3km	3 - 4km	above 5km	
Male	71	30	31	13	11	5	161
	44.10	18.63	19.25	8.07	6.83	3.11	100.00
Female	10	7	5	6		7	35
	28.57	20.00	14.29	17.14		20.00	100.00
Total	81	37	36	19	11	12	196
	41.33	18.88	18.37	9.69	5.61	6.12	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages
Source: field survey 2005

Table 5.15 reveals that 44.10% of male are located within 1/2km to bus stop while about 28.57% of female stay ½ km away from bus top. The analysis shows that higher percentage of people is located within ½km to bus stop, about 20% of female is located within 5km away from bus stop. This can be used to re-organized the bus stop location for effective implementation of the transport initiative, by following the standard of locating bus stops within at least 300m away from residential areas.

d. Vehicle Waiting Time

Table 5.16 – Cross Tab of Gender and Time spent waiting for Vehicle

Determinant Categories	Response Variable Categories						Total
	5 - 10mins	11 - 15 mins	16 - 20 mins	21 - 25 mins	26 - 30 mins	Above 30 mins	
Male	66	39	16	5	21	14	161
	40.99	24.22	9.94	3.11	13.04	8.70	100.00
Female	18	14	1			1	34
	52.94	41.18	2.94			2.94	100.00
Total	84	53	17	5	21	15	195
	43.08	27.18	8.72	2.56	10.77	7.69	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages
Source: field survey 2005

Table 5.16 shows that 52.94% of the female wait at the bus stop between 5-10mins while the 40.99% of the male waits for such period of time. The table shows that the longer the time, the higher the percentage of male against female waiting for vehicle at the bus stop. This is so because the male are stronger than the female. That is why the table shows that only 8.70% of male waits above 30mints as against 2.9% of female.

The significant of this is to show the minimum and the maximum waiting time in the study area and to see how it can be reduced while implementing the new transport initiative. In this study it has been proved that 5-15 mints is the period that people do wait for vehicle. This can be reduced through proper scheduling and addition of more fleet in to various routs and adequate timing to enhance or reduce waiting time.

e) Nature of work and time spent waiting for vehicle

Table 5.17 - CrossTab of Nature of Work and Time spent waiting for Vehicle

Determinant Categories	Response Variable Categories						Total
	5-10mins	11 - 15 mins	16 - 20 mins	21 - 25 mins	26 - 30 mins	Above 30 min	
Administration	14	7	1	2	9	10	43
	32.56	16.28	2.33	4.65	20.93	23.26	100.00
Professional	38	30	11	1	10	3	93
	40.86	32.26	11.83	1.08	10.75	3.23	100.00
Teaching	5	3		1		2	11
	45.45	27.27		9.09		18.18	100.00
Clerical Officer	7	1					8
	87.50	12.50					100.00
Messenger	6	3	3		1		13
	46.15	23.08	23.08		7.69		100.00
Others	14	4	2	1	1		22
	63.64	18.18	9.09	4.55	4.55		100.00
Total	84	48	17	5	21	15	190
	44.21	25.26	8.95	2.63	11.05	7.89	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages
Source: field survey 2005

Table 5.17 shows that 5-10mins and 11-15mins are the periods various categories of occupation complain to have been waiting for vehicle at bus stop. The self-employed wait more. About 63.64% of them wait between 5-10mints in the bus stop. This information can be used to enhance the assignment of more fleet to improved on reliability and scheduling to reduced waiting time.

f) Age and inconveniences in public bus service

Table 5.18 - Crosstab of Age and Inconveniences in public bus service

Determinant Categories	Response Variable Categories								Total
	High fare	Bus stop too far	Long wait for bus	No shelter at Bus stop	Transfering between vehicles	Overcrowding and rushing	Inside bus Unpleasing	Others	
16 – 20			2			1			3
			66.67			33.33			100.00
21 - 25	4		3	2	2	7	4		22
	18.18		13.64	9.09	9.09	31.82	18.18		100.00
25 - 30	2		5	7	9	5	3	2	33
	6.06		15.15	21.21	27.27	15.15	9.09	6.06	100.00
31 - 40	13	6	22	11	18	10	3	9	92
	14.13	6.52	23.91	11.96	19.57	10.87	3.26	9.78	100.00
41- 50	11		12	6	8	3		2	42
	26.19		28.57	14.29	19.05	7.14		4.76	100.00
51-60	1								1
	100.00								100.00
Total	31	6	44	26	37	26	10	13	193
	16.06	3.11	22.80	13.47	19.17	13.47	5.18	6.74	100.00

Upper figures indicate number of responses while the Lower figure indicate percentages
Source: field survey 2005

Table 5.18 shows responses of different age group as they use the public bus. 22.80% in all the age groups complains of long waiting for bus. Another problem that causes inconveniences that is identified in this study is the lack of direct ride to destination, 19.17% attest to this fact. While 16.06% considers the fare that is charged presently to be high for them to bear. Another 13.47% complains of overcrowding at bus stops. Some other 13.47% again complains of lack of shelter at bus. All these are areas of great concern that need to be addressed so as to improve on the implementation of the transport initiative.

5.6 FINDINGS OF THE STUDY AND VIABILITY OF (ABUTRANS)

Findings in chapter five of this study show that the ABUTRANS is not implementable under the present condition except with some major adjustment. Section 5.4.1 shows the determinants of mode choice in FCT. Most of the determinants support the use of private cars as against the bus mass transit.

Level of education for example, which is one of the determinants shows that about 52.8% of those at the tertiary categories choose the car as their present travel mode and they constitute the majority in the sample.

Marital status is also one of the determinants it shows that about 55% of the married families interviewed in the study choose the car as the basic travel mode while 33% of the single families choose the car as against 27% for non-married and 34% for married. This is an indication that some, basic adjustment need to be taken.

Income of individual also shows similar indication that the higher the income of an individual the more he tends to use the private car as his travel mode. This is shown clearly in table 5.12. 46% of those receiving between N20,000 – N29,99 choose car and about 46% also choose the bus as their travel mode but as the monthly income increase to between N30,000 – N39,999 the percentage of people using car has increased to 57% while that of the bus has reduced to 42%. For monthly income of N50,000 – N59,999, 70% of them choose the car while only 2% of them choose the bus. This is a clear indication that the transport initiative

especially the aspect that relate to the choice of bus transit over car need to be adjusted. What is required in this respect is to make the buses conducive, and to introduced staff buses to complement those of the public.

5.7 SUMMARY AND FINDINGS

SOCIO-ECONOMIC DETERMINANTS

The 'r' stands for correlation values

a. Level of education (r = - 257)

b. Marital status (r = - 222)

c. Employment status (r = - 306)

d. Residential location (r = - 324)

e. Average monthly earning (r = - 442)

TRAVEL SERVICE CHARACTERISTICS

Time leaving for work affect gender and occupation in the study.

a. Time leaving for work
   - Gender (r= .223)
   - Occupation (r=.214)

b. Distance from house to bus stop - Gender (r = .190) only affect gender

c. Time waiting for vehicle
   - Gender (r= .223)
   - Occupation (r=.214)

   Affects gender and occupation

d. Inconvenient in bus - Gender (r = .212) affect only gender.

CHAPTER SIX

PLANNING RECOMMENDATION ON HOW TO IMPLEMENT THE NEW TRANSPORT INITIATIVE

6.1 INTRODUCTION

This chapter is aimed at recommending positive measures for better implementation of the transport initiative. This can be done through addressing the key determinants as identified in the last chapter. For the new transport initiative to succeed, such factors have to be addressed. The origin and destination (O & D) survey commissioned by (FCTA) alone can not provide the needed knowledge for implementing the transport initiative as assumed by (FCTA). Understanding the factors that influence people's choice of mode should precede provision of the transport facilities. These are the critical knowledge for proper implementation of the new transport initiative.

6.2 SOCIO ECONOMIC DETERMINANTS AND TRAVEL MODE CHOICE

For successful implementation of the transport initiative the following socio-economic as well as travel service determinants need to be addressed (by the relevant authorities in FCTA) in order to enhance implementation of the transport plan. This includes:

a) Level of education as it affects mode choice.

b) Marital status as it affects mode choice.

c) Employment status as it affects mode choice.

d) Residential location as it affects mode choice.

e) Average monthly income and its effect on mode choice.

a) ***LEVEL OF EDUCATION AND CHOICE OF TRAVEL MODE***

The study shows that the level of education is a determinant in the choice of travel mode in FCT. It has been revealed that the higher the educational qualification of the respondents, the more he chooses the car as a travel mode. The study indicates that 52.87% of those in the tertiary educational level uses car as the major travel mode. In all the various modes the car account for 47.74% followed by bus, 31.66% as indicated in Table 5.2.

Therefore, level of education favours the choice of car. In order to discourage this trend, there is the need for various government agencies and departments to introduce staff buses at affordable price and in addition, the proposed mass-transit should be efficient, comfortable and reliable with proper connectivity to all locations. This can be adequately handled by the logistics and special unit, under the supervision of the mass transit/para transit division.

b) ***MARITAL STATUS AND CHOICE OF TRAVEL MODE***

Marital status is identified in this study to be a determinant for choice of travel mode. The study shows that the married families choose car as their major travel mode while the single families also choose the same but much more less than the married families. About 54.96% of the married uses car as against 32.86% of the single families. This also means that emphasis should be targeted at the married families, while implementing the transport plan. The married families also use the bus mode as an alternative to travel mode which accounts for about 33.59%. This also means that only little effort is required to encourage them to use buses.

It is therefore recommended that areas of improvement should cover the single families. This can be achieved through the provision of adequate service as mentioned earlier on. The proposed Mass-transit should be efficient, comfortable, reliable with high connectivity to all areas in order to attract the married families and more among the single families to drop their cars for the bus. This aspect can be handle by the logistic and special units department of transportation under the supervision of Mass-transit/para transit division and the planning division, this are the two divisions that are assigned to take charge of mass-transit operations in general, while the planning section oversees the preparation of the city traffic plan designating major, secondary and limited access routes in the FCTA.

c) *EMPLOYMENT STATUS AND CHOICE OF TRAVEL MODE*

The study shows that a persons employment status determines the type of mode he or she chooses. Employment status is categorized as full-time and part-time employment. The study further shows that 47.7% of those with full-time employment choose car as their major travel mode, followed by bus 31.03% then taxi, 12.64%. The part-time employees however, use motorcycle as their major travel mode because they belong to the lower income earning groups. It constitutes 66.67% followed by the bus, 3.3%. In this case, the relevant authority (FCTA) should concentrate on the full-time workers as well as the part-time because more cars are used by the full-time workers, while more of commercial motorcycle is been chosen by the part-time workers. However, both modes i.e. the cars and motorcycle should be discouraged for effective implementation of the new transport initiative.

The most important thing to be done in this respect is to improve the service of the mass-transit as earlier mentioned, to improve bus rider-ship amongst the full-time employees. This is an aspect that requires the input of Mass transit/para-transit division of the transport department.

While for those part-time employees, outright banning of the system as proposed by the transport department will be an advantage to the new transport plan. That will encourage using bus, taxi, or walking as the only options. The relevant division of the transport department charged with this task is the Traffic Engineering Unit under the supervision of the

VIO, Police FRSC as they are assigned the responsibility of enforcing traffic laws in the F.C.T.

d) ***RESIDENTIAL LOCATION AND CHOICE OF TRAVEL MODE***

Table 5.11 shows the percentage of various modes that commute to the capital city from the four sampled areas. The study shows that in all, the car mode is the dominant. To address this problem, there is the need to provide enough number of buses on all the routes. Park-n- ride facilities should also be provided at some locations along the routes to reduce the inflow of small cars to the capital city. In addition, the mass-transit should be attractive with all the needed quality of service especially, reliability in speed, comfort and connectivity. These are the services enjoyed by the private car owners that need to be complemented by the bus service, considering the fact that the people have to travel from far to the capital city. Bus rapid lanes can also be provided to give bus advantage in congested periods. All these are short term measures of solving traffic congestion as a result of the need to commute to the capital city.

As a long-term measures to these problems, it is recommended that activities should be decentralized to all the satellite towns and they should be provided with the basic amenities to attract people. That will considerably reduce the need to go into the capital city in search of basic amenities or services.

e) ***AVERAGE MONTHLY INCOME AND CHOICE OF TRAVEL MODE***

In this study, income has also been identified as a major determinant. Table 5.12 shows various categories of income and their corresponding modes choosing. The study shows that the higher the income, the more the choice of car as the dominant travel mode, while the less income the more the choice of other modes i.e. bus, taxi, commercial motorcycle.

In addition to adequate and efficient bus service, staff bus services should be introduced by various parastatals and departments so as to encourage the high income level to drop their private cars for such buses.

More of traffic restrain measures need to be introduced after improving the service characteristics of the mass-transit. Both the traffic engineering and the mass-transit sections should be mobilized to introduce the needed change as regards, bus quality of service, while the VIO, FRSC and the police should be mobilized to enforce the car restrain policies in F.C.T.

However, it is clear that the above determinants of modal choice in FCT favour the car mode over all other modes in the study area. It then shows that it is important to address the above determinants considering the fact that they are detrimental to the success of the new transport initiative, especially as it involves traffic congestion. It is now clear from this study that the detrimental mode to be targeted in achieving the success of the new transport initiative is the car, while the detrimental factors are the individual educational level, marital status, employment status,

residential location and individual income. These all favour the choice of car as the dominant mode. Another measure needed here in addition to improving the service qualities as recommended earlier on for (mass-transit) are indirect measure indicated in the literature, to include the following:-

i. Traffic restrains measures such as banning cars on some selected street or introduction of park-n-ride system as earlier proposed.

ii. Using measures such as licensing to restrict car entry and use in the city center or central business district (CBD) as practiced in Greece and Singapore.

iii. Introduction of parking fee on cars in high activity areas.

iv. Fiscal measure like heavy important duties or taxes on spare parts. This is mostly through government budgetary fiscal policy

v. Provision of bus rapid path as earlier proposed to give the bus mode more advantage on congested routes, which may attract some car owners.

The combination of both the traffic restrain and improved quality of service will give a good option for both the captive and choice rider to use more of the mass-transit.

6.3 RECOMMENDATIONS ON TRAVEL SERVICE CHARACTERISTICS

Analysis in chapter five indicates that the most important aspect of the service characteristic required by the FCT residents which needs to be addressed are the following:

i. Distance to bus stops

ii. Time spent waiting for vehicles

iii. Transferring between vehicles

iv. High fare

v. Overcrowding in bus stops

a) ***DISTANCE TO BUS STOP***

This factor is identified in this study to have affect on gender, position of a person in the house: either, Head of the Household i.e. son, house help, friend or relative. The survey has revealed that most of the people complained that they spent between 1-5minutes to get to the bus stops. For the male and female respondents in the study, about, 41.33% use between 1-5minutes to the bus stop. While amongst the various positions of people in the house, 41.03% use between 1-5minutes to get to the bus stops. This shows that a higher percentage of the respondents use between 1-5 minutes to trek to the bus stops. To improve on this, bus stop should be constructed within the range of 500 meters in the CBD and 300 – 400 metres in high density locations, while on intra city routes, lay-bys should be located at interval of 10 – 12 km and in every settlement along the routes. The logistic and special unit under the supervision of transport survey and study division and the planning division should be assigned to implement this task.

b) ***VEHICLE WAITING TIME***

Waiting time is a factor that determines the type of mode one chooses, as it affects the gender and nature of ones work. The study shows that 52.9% respondents constituting female complained of waiting for about 15-20minutes in the bus stops. While 40.99% of the male counterpart also complained of waiting for same period of time. While amongst various professions, the self employed, that is those in business about 66.64% of them complained of waiting for 15-20minutes at the bus stops. Others like the clerical officers who observed the same at bus stops constitutes about 87.50%.

Waiting time can be reduced through increasing the fleet of buses in a bus stop. Areas with high concentration of passengers can be allocated say 5 – 6 buses stationed at a time, each vehicle moving at an interval of between 15 – 20 minutes. While less traffic location can have 2.-3 buses stationed each vehicle moving at an interval of 20 – 25 minutes time period. This aspect should be under the control of transport survey and studies unit for easy implementation and adjustments where necessary.

c) TRANSFERRING BETWEEN VEHICLE

This is another travel characteristic that needs some adjustments while implementing the new transport plan. Lack of direct ride to destinations of commuters has led the present transport operators' quest for more money as they decide to shorten the distance in order to exploit the commuters. The new transport system needs to take care of this

aspects by providing flat rate charges on intercity routes and payment made according to distance covered on intra-city routes. While journeys should be made to terminate at major activity locations such as CBD, market and offices. This will greatly assist in direct routing to destination.

Planning and mass-transit-division of the transport department should take up these challenges as would involve land use planning and proper schedule of bus-fleet to cover all areas.

d) ***HIGH FARE***

The study indicates that about 26.17% of the respondents, most of which are within the age group of 41-50yrs complained of high fare charges by the present transport operators in FCT. Another 14.13% amongst people within the age of 31-40 also sees the present fare charged to be too high. This is true because the journeys were shortened in order to give room for exploitation by the transport operators.

The following are recommended to check the issue of fare charges. Two main type of fare are recommended this are.

1. Straight line scale method
2. Flat rate fare:

The straight line scale method is for those commuters that travel from the satellite towns Intra-city routes. This system stipulate that, the passengers pays according to the distance covered i.e. those coming

from Gwagwalada will pay higher than those coming from Kubwa or Nyanya.

While the flat rate fare should be charge within the intercity routes, that is, all locations within the city capital should attract same fare.

e) ***OVERCROWDING AT BUS STOP***

This is another aspect that is identified as a problem among transport service characteristics that needs to be improved, while implementing the new transport initiative. The study shows that 33.33% of those within the age of 16-20yrs and 31.32% respondents between the age of 21-25yrs and another 15% between age 25-30yrs all attest to this fact that the bus stops are usually overcrowded with people.

To address the problems of overcrowding minimum of five buses should be stationed at highly concentrated bus stops such as market and office area. Each bus should be timed to give a gap of about 10 – 15 minutes intervals between each of the buses. This will reduced overcrowding, and check excess waiting time in the buses tip.

While in each of the external routes or intra-city routes these should be as much as twenty or more buses moving at the interval of 15 minutes each. The mass transit division should oversee the implementation of the above reports to enhance better services. The relevant authority i.e. FCTA transport department need to address this issue in order to enhance the implementation of the transport plan. The transport survey and studies division should take charge of this aspect, while the mass-transit division

should oversee the introduction of the new pricing system, by all the transport operators.

6.4 CONCLUSION

Considering the present condition of transport system in Abuja, it is required that an urgent attention be taken before it gets out of control. To effectively deal with the situation, there is the need to first of all understand the factors that lead to the problems before propounding solutions. Providing high capacity based public transport modes to shift travel mode away from car, in FCT is not the immediate solution for solving traffic congestion problem. Understanding various factors that account for the dominants of the car mode and addressing them are the critical knowledge that is needed. Not the introduction of an alternative mode of transportation to solve congestion problem.

In this study, it is shown that the major reasons why the streets of Abuja are characterized by traffic congestion of too many private cars, is identified to be due to high level of car that are used among the different educational level of people, because of their marital, employment status, the distance between working place as well as individual income. All these are the detrimental factors that undermine the implementablity of the transport initiative.

While the required travel service characteristics needs to be addressed so as to attract the residents of Abuja to change their mode, the following service characteristics are identified in this study: Reducing

distance to bus stop, reducing waiting time at bus stops, provide direct ride, reducing transportation fare and check issue of overcrowding at bus stops. Having this information and addressing them are the critical knowledge required for implementing the Abuja public transport initiative. This finding will however, complement the earlier result of the study conducted by M/S ASTAC Nig. Ltd. Together the two studies will provide the required knowledge base for implementing the Abuja Public Transport initiative (Abutrans).

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