

# **An Evaluation of the Impact of Bus Rapid Transit in Urban Intra-city Passenger movement in Lagos State**

by

**Gbadamosi Kolawole , T. Ph.D**  
**Centre for Transport Studies Olabisi Onabanjo**  
**University Ago Iwoye , Ogun State, Nigeria .**  
**e-mail: kt\_bad@yahoo.com**

## *Abstract*

The role of effective public transportation system in the economic growth and development of human settlements cannot be overemphasized. The centrally coordinated effort of the Lagos State Government was directed towards resolving fundamental problems facing urban transportation in Lagos state which is somewhat similar to what is being experienced in other locations with outburst population coupled with its attendant problems on spatial interaction.

The of promotion of Bus Rapid Transit (BRT) is a veritable option directed at improving the service delivery in the public passenger transport particularly as it affects the most predominant form of transport mode in Nigeria – road transport. The essence is to relieve congestion, enhance mobility, and improve the environment especially with regard to pollution in the Lagos metropolis.

Increasing recognition of the need for high-quality transit service to alleviate these conditions has brought about the development of viable alternatives provided with the current efforts in the development of dedicated bus lanes. This was after many trial and errors with

---

Being the Full length of a paper to be presented at WCTR 2010, Lisbon

Keke Mawa and Okada. The capacity for park and ride tendency of The BRT scheme has fuelled growing demand in urban commuter passenger services which calls for the development of alternative modes as in rail and water transportation services scheme judging from the strategic position of Lagos.

The dedicated bus lane provided by the Bus Rapid Transit is highly innovative in the course of finding a lasting solution to the challenges confronting urban passenger transportation in Lagos state.

This paper Examines urban transportation situation in Nigeria with reference to Lagos state Bus Rapid Transportation within the two years of intensive operation along designated traffic corridors. It also examines the overall contribution of the Bus Rapid Transit in providing a lasting solution to problems of urban passenger operation in Lagos state coupled with an evaluation of its social and economic impact. Attempt was also made to reflect on accident indices involving the scheme while users' and staff perception of what it takes to render acceptable services were considered as rational approach to establish the extent to which the scheme has contributed to solving major problems confronting urban transportation in the state among which include – Traffic Congestion, Road Traffic Accident, Environmental degradation, Air pollution Crime and Noise. The mode, schedule and style of operation were examined with a view to identify areas requiring improvement.

The potentials of Lagos in the development integrated transport system considering its strategic uniqueness to make available wider choice of alternatives in the course of intra-city trips along different traffic corridors in the State were explored.

Preliminary investigation on users' and staff perception shows on the average that users are generally satisfied with the operation of the BRT Scheme. They see the scheme as a welcome development in the process of urban passenger movement in a city with extensive commuter transportation demand.

The research was able to establish the rate of accident among the BRT buses to be infinitesimally low while, the rate of susceptibility of BRT passengers to road traffic accident was equally low both were 0.000008 and 0.000006 respectively. It was also established that the degree of variation in the magnitude of passenger intra-city travel demand varies significantly among the traffic corridors with Berger TBS/CMS and Ikorodu-CMS and Ketu Traffic Corridors having the highest preponderance of passenger traffic generation at 40.9% and 26.3 % respectively. The study revealed an annual average of 0.6 km mileage per passenger based on the level of BRT bus operation along the exiting traffic corridors.

It is being recommended that the Government should improve the capacity of the operation of the BRT scheme in relation to the full introduction of park and ride facilities at strategic points to accentuate the level of patronage of BRT busses along the various traffic corridors. The paper also recommended the development of alternative modes as in rail and water transportation services scheme judging from the strategic position of Lagos.

## **2.0 Methodology**

Data used in this paper were obtained from the operational records of the Lagos Bus Management the operator of the Lagos BRT Bus Scheme. Data considered for evaluation included the Passengers record of patronage along the 7 traffic corridors in operation as at the time of conducting this research: Dopemu- CMS; Berger TBS/CMS; Ikorodu CMS Ketu; Abule Egaba CMS; Osodi ; Mile 12- CMS; and Mile 2-CMS . Available data covered the period of 2 years in which the BRT buses has been in operation 2007-2008. The records of the incidences of road traffic accidents among the buses were considered and relevant indices regarding the average rate of accidents among passengers and BRT bus exposure to accidents with reference to kilometreage travelled were estimated. A cross sectional survey of selected BRT passengers and staff was conducted to reflect on their opining on the operation and what it takes to render acceptable transit services in the newly introduced intra-city commuter passenger buses in form of a focus group discussion.

## **3.0 Urbanization and urban transport condition in Nigeria**

Urbanization and city growth in developing countries are characterized by rapidity of urban increase, urbanization, industrialization, and a high rate of urban population growth by natural increase and migration (Oyesiku, 2002).

The second half of the 20<sup>th</sup> century witnessed rapid rate of urbanization and emergence of cities in various parts of Nigeria due to a number of factors among which are: introduction of wheeled transportation, particularly railway and road; categorization of settlement into hierarchical order of township; introduction of monetized economy and consequently production of cash crops and exploitation of mineral resources; continuous geopolitical restructuring, through creation of states and local governments in 1967, 1976, 1987, 1991 and 1996, 2001; and the industrialization process between 1960 and 1975, which

was based on import substitution strategies and consumer market for imported goods and services (Oyesiku 2002).

In Nigeria, urban transport that serves as the sinew, binding together various land uses has not only remained inefficient, it has grown over the years to be expensive and dangerous (Egunjobi 1999). In many Nigerian cities, urban transport exhibits remarkable features. Several studies have revealed these features of Nigerian urban transport (Adeniji, 1993; Adesanya, 1996; Adesanya and Adeniji, 1998; Torres, 2001; Oyesiku, 2002, 2002; Ogunsanya, Asiyabola 2007, 2002; Olukoju, 2003; Osita et al, 2003; Vandu-Chikolo, 2004, etc)

Since Nigerian political independence in 1960, every successive government in the federation has shown appreciable concern for transport planning and development. This concern is reflected in the share of the transport sector out of the total planned public investment. As noted by Filani (2002) the transport sector has consumed on the average 20.3 percent of the total planned national resource outlay since the First National Development Plan Period (1962-1968). This according to him means that about 20 Kobo of every Naira in the planned expenditure in Nigeria's development efforts since 1962 had been allocated to the transport sector. Even though there had been significant achievement in this sector, the sector is still confronted with many problems which include among others, inadequate planning, lack of intermodal coordination, insufficient public transport to cope with rising demand, urban traffic congestion etc. The enormous resources committed to the development of transport still remain inadequate. Hitherto, cities in Nigeria suffer from inadequate intra-connectivity (Filani 2002; Oyesiku 2002a; Ogunsanya 2002; Egunjobi 2002; Osita et al 2003). There is lack of balance between urban structure and urban transportation system in Nigeria (Adeniji, 1993; Adesanya and Adeniji, 1998). Modal split is inappropriate due to the neglect

of potentially viable modes of public transport, while the unbalanced capacity of networks creates traffic congestion, excessive consumption of energy and environmental pollution (Adesanya and Adeniji, 1998). A significant proportion of roads in Nigerian have been crumbling due to overused and inadequate maintenance resulting in their deterioration. According to the World Bank Report, only 30 percent of all categories of road in Nigeria could be regarded as being in good condition; the remaining 70 percent is in different states of disrepair (Filani 2002).

Filani (2002) noted that the country has the lowest level of motorization in West Africa with as low as 4 vehicles per 1000 inhabitants. To compound the problem further, the rate of vehicle growth is much lower than the population growth rate. Resulting from this mismatch is a general fall in the level of motorization in all parts of the country. Since 1982 and up till 1989/1990 there was a substantial reduction in new vehicle registration in all parts of the country

The reduction then is a reflection of the economic recession and the consequent stricter restriction on all categories of imports, which include private vehicles and spare parts. The slump in the oil revenue since 1983 resulted in the institution of series of economic adjustment program (SAP) in Nigeria. This involved the strict control of foreign exchange spending. Since SAP involved, among other things, adjustment of the local currency (Naira) to international convertible currencies as well as withdrawal of petroleum subsidy, vehicle prices and maintenance costs skyrocketed beyond the reach of most individuals in the country. The consequences are the following crises (Filani 2002):

- High prices prevent the purchase of new vehicles; the astronomical prices of the available limited spare parts make vehicle maintenance almost impossible;

- Public transport operators are saddled with rickety and ill-maintained vehicles due to exorbitant prices of spare parts and their inability to purchase new ones to expand their fleet of vehicles; and
- Queues of passengers at major urban terminals and along routes get longer and longer every day. The nature and scale of urban transportation problems vary with size and shape of the urban area, the balance between use of private and public transport and the kind of road and public transport infrastructure that exists (Brain and Knowles, 2000 ) In the industrialized country increasing volumes of private cars, public transport and commercial vehicle with lower carrying capacity have exposed the inadequacies of urban road infrastructure. The rapid increase in private car ownership coupled with the decline in commercial bus operation has rarely been accompanied by a contemporary upgrade of the road network.

#### **4.0 Urban Transport Situation in Lagos State**

Lagos is essentially a product of the Europeans; its growth is the result of its coastal location and political status as the seat of the colonial administration. Judging by the extensive industrial and commercial activities Lagos became economic nerve centre of the country . The state accounts for 65% of all commercial and industrial activities in the country a situation that is facilitated by the strategic location of the state as a Seaport City The current population of Lagos is estimated at 15million which represent 10.7% of the estimated 140,000,000 population of Nigeria. Lagos as one of the major growing mega cities of the world has the longest travel time to and from work. Work travel time in Lagos, ( Auclair ,1999 ) Transportation situation in the state like any other Urban centres as been identified through many studies conducted by local and foreign consultants and the world bank agencies to include among others the following

1. Steady decline in the level of motorization for over a decade as motor vehicle fleet decreased by 50 percent between 1990 and 1998, leading to acute shortage of transport services .
2. Overcrowded public transport system and use of used (and not road worthy ) vehicles imported from different parts of the world particularly from Europe and America. While the use of already old and discarded vehicles in Europe and America has been seen as contributing to increased level of motorization, many vehicles on the highway are highly deteriorated as a result of the age of the vehicles , bad road conditions, unavailability of original spare-parts and decreasing level of disposable income of the population.
3. Incessant traffic congestion, awkward parking system and environmental pollution are part of the hardship of transport system in many cities due to continuous deteriorating condition of the streets and poor state of the roads that slow down traffic.
4. Haphazard and uncoordinated ownership and organization of the road public transport system coupled with the complete absence of comprehensive and integrated urban mass transport system. In comparison with transport system in major cities of the world, that of the Nigerian cities is nowhere near a mass transportation system.
5. Increasing scourge of road traffic accident that continues unabated in spite of appreciable role of government established road safety commission. Recent statistics show that while the African countries accounts for 11 percent of world's



estimated road fatality , the fatality index of 0.28 for Nigeria was that highest in the continent in 1999(Gbadamosi 2002 , Arosanyin, 2001, Jacobs et al 1997).

Lagos state in the last few decades has witnessed an upsurge in private car ownership a situation which has resulted in a sharp decline in the patronage of public transport which in itself are grossly inadequate. Traffic management, new initiatives in public transport, the current policy on urban renewal programmes and modernization consummated under the Lagos mega city project are all attempt to reduce the impact of transportation problems by commuters .

It is against this backdrop that of the city transportation scene that transportation planners and researchers, not only in Nigeria but also in other developing countries have been exploring the possibility of encouraging sustainable urban transportation system in which Lagos State has taken a queue .

## **5.0 BRT Operation Performance and Schedules in Lagos State**

The Bus Rapid Transfer in Lagos State is a dramatic improvement in the efforts of the Lagos government at improving the intra urban mobility which has almost gone comatose considering the associated problems and difficulties of undertaking city travels and other important trips. The BRT as practice in certain location offers dedicated interference free segregated lanes to facilitate and guarantee fast but reliable transport services. The advantage of free non interference lane from other road users is a guarantee for free flow of traffic. It has reduced to the barest minimum the problem associated with commercial bus operators and transport generally in the state popularly called “ Molue ” coupled with nuisance created by Okada riders – motor cycle operators , It has helped in improving the air quality and meet the mobility need of particularly the downtrodden mercies in the state.

The BRT is an antidote to the transportation problems which at a point posed insurmountable challenges in the process of intra city passenger movement before the advent of BRT. The chaotic situation associated with commercial passenger transportation has resulted in the in the introduction of superficial approach such as the introduction of tricycle and commercial motorcycles with their attendant problems that ended up compounding the already saturated urban transportation problems in the state . Most of the buses operating on the state roads are scraps and have on many occasions resulted in the occurrence of terrible road accidents while, the tricycle and motor cycle made the matter worse by aggravating the already precarious accident situation in the state. This is in addition to their nefarious activities regarding perpetration of crime. BRT when compared to the earlier non sustainable approach urban transportation services has capacity for reducing returns on investment. It has potential for reducing overhead cost on running private vehicle and minimizing the problems associated with current levels of urban passenger transport operation.

BRT initiative was a result of years painstaking planning to solve the problems of intra city passenger transportation in Lagos .

## **6.0 BRT Scheme traffic corridors/ Routes and Newly Proposed Routes**

1. Dopemu-CMS
2. Osodi
3. Mile 2 -CMS
4. Osodi
5. Berger –TBS-CMS
6. Mile 12 CMS
7. Abule Egba -CMS

### **Newly proposed Routes**

Festac; Yaba to Adekunle to Obalende; Mile 12 to Osodi; Ajah - TBS

Sango – Osodi- TBS and Ikeja to U-turn.

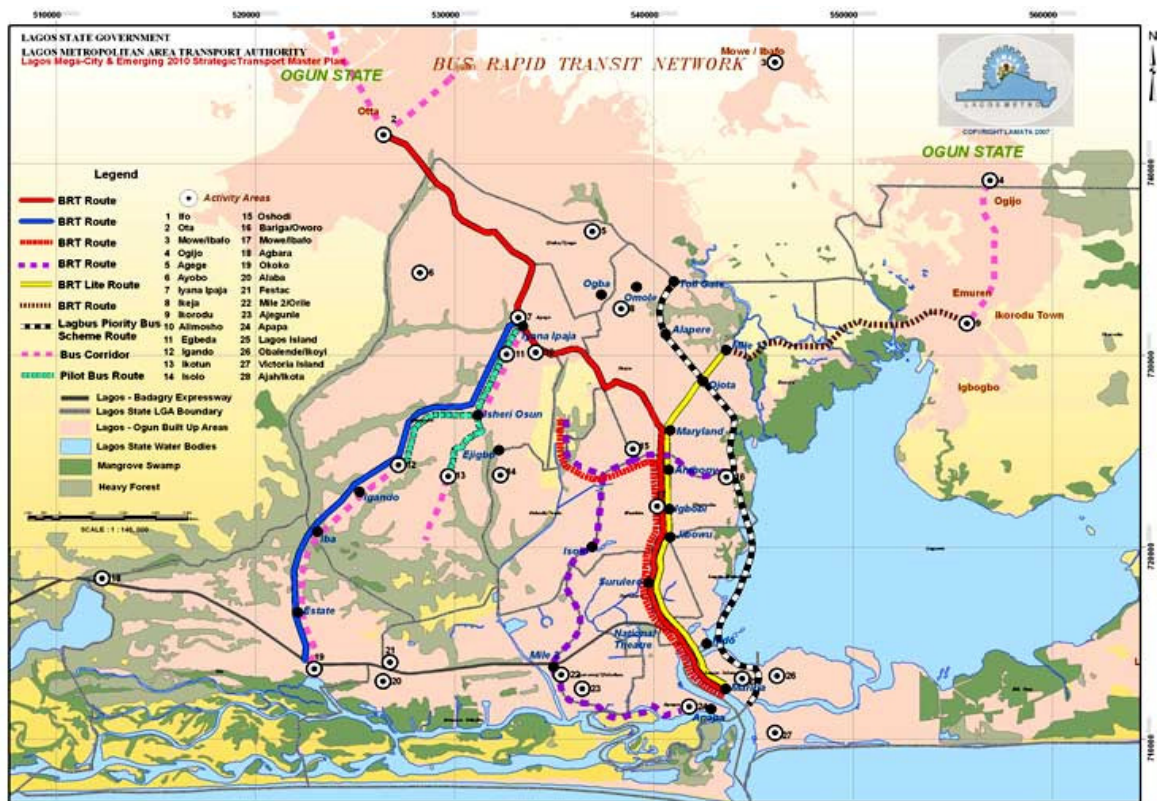


Plate 1 : Map of BRT Traffic Corridors in the State It also include existing and proposed extension

## 7.0 BRT Bus Passenger Route Operation and BRT Bus Mileage Coverage Analysis

An attempt is made here to examine the operational performance of the BRT as coordinated by Lagos State Metropolitan Authority and LAGBUS Asset Management. Table 1 reflected the mileage of and passenger patronage on various route between 2007 and 2009.

**Table 1: BRT BUS Passenger Route Operation 2007 -2009**

Year/ Month		Route							
		Dopemu- CMS	Bergar – TBS/CMS	Ikorodu- CMS and Ketu	Abule Egba – CMS	Osodi	Mile 12- CMS	Mile 2- CMS	
2007									
	Jan								
	Feb		34,531						
	Mar		114,254						
	Apr		162,235						
	May		196,100						
	Jun		237,795						
	July	12,925	265,076		619			6,014	
	Aug	38,689	148,764		12,595			14,450	
	Sept	45,388	150,334		66,031			13,883	
	Oct	47,039	166,100		53,958	61,753		23,155	
	Nov	54,549	150,959		33,296	80,613		9,747	
	Dec	38,222	118,933		21,398	42,484		17,994	
<b>Sub Total</b>		<b>236,812</b>	<b>1745081</b>		<b>190,897</b>	<b>184,850</b>		<b>85,243</b>	<b>2442883</b>
2008	Jan	51,012	163,199	2,183	29,836	56,402		21,992	
	Feb	53,405	140,651	58,031	28,574	60,596		8,916	
	Mar	50,931	184,095	225,820	36,984	69,764	16,389	20,271	
	Apr	52,812	163,824	251,149	37,231	65,262	28546	23,320	
	May	57,669	181,632	237,848	36,662	68,487	31,498	27,430	
	Jun	72,411	233,731	329,386	41,993	55,975	52,589	40,252	
	Jul	58,381	205,556	295,848	44,811	47,821	59,360	32,648	
	Aug	9,415	245,780	329,683	43,150	53,326	52,977	38,516	
	Sept	65,385	252,910	280,926	48,983	48,854	52,687	37,489	
	Oct	68,824	272,556	357,095	37,759	35,317	63,792	33,411	
	Nov	66,965	206,208	329,317	42,727	58,829	40,895	34,902	
	Dec	56,616	126,140	180,981	30,510	53,166	45,668	30,853	
<b>Sub</b>		<b>663,826</b>	<b>2,376,282</b>	<b>265,2404</b>	<b>459220</b>	<b>673799</b>	<b>444,401</b>	<b>3,50,000</b>	<b>7619932</b>

<b>Total</b>									
Final Total		<b>900,638</b>	<b>4,121,363</b>	<b>2,652,404</b>	<b>650,117</b>	<b>858,649</b>	<b>444,401</b>	<b>435,243</b>	<b>100,62,815</b>
%		<b>8.9%</b>	<b>40.9%</b>	<b>26.4%</b>	<b>6.5%</b>	<b>8.5%</b>	<b>4.4%</b>	<b>4.3%</b>	

*Source : LAG Bus Management , BRT Operator , Ikeja, Lagos.*

An evaluation of the BRT commuter passenger operation along seven (7) BRT main traffic corridors / routes in the state – Dopemu- CMS; Berger-TBS/CMS; Ikorodu-CMS and Ketu; Abule Egba –CMS; Osodi; Mile 12-CMS ;and Mile 2- CMS between 2007 and 2008 indicated that the a total of 100,62,815 passenger/ commuters were moved within the state along the main traffic corridors . The commencement of passenger operation varies along the route of operation (See table 1).

From all indication Berger TBS/CMS traffic corridor has the highest magnitude of passenger frequency of 4,121,363 which represent 40.9% of the total passenger frequency along all the traffic corridors; this is followed by Ikorodu CMS and Ketu traffic corridor with 26.4% of the total passenger frequency for the period under investigation. The passenger/ commuter frequency recorded along Mile 12 and Mile2 – CMS are 4.4% and 4.3% respectively are least recorded along all the traffic routes. The leading frequency recoded along Berger TBS/CMS can be explained by the fact that route carries commuter traffic to the main Central Business district of Lagos state hence demand for passenger services along that route is enormous and regular when compared to other routes . Ikorodu CMS and Ketu traffic corridor could be explained with the presence of one of the major food stuff market in the state located along this traffic corridor while ,Ikorodu town one the most densely populated part of the state is also being served by this corridor. It was also observed that the level of passenger /Commuter demand and utilization of BRT is increasing steadily along all the

traffic corridors which implies that the demand is increasing as the services is becoming popular due to its regularity and convenience of service .

**Table 2: Total Mileage Coverage by BRT Busses Seven Traffic Corridors 2007- 2008**

Traffic Corridors/Route	Vehicle Kilometerage /Year 2007	2008	TOTAL
Dopemu-CMS	358314	1033737	1,392,051
Berger TBS/CMS	1712948	1735240	3,448,188
Ikorodu CMS and Ketu	-	1644566	1,644,566
Abule Egaba CMS	191006	439172	63,0178
Osodi	100669	508435	609,104
Mile 12- CMS	-	359155	359,155
Mile 2 -CMS	98996	347757	446,753
<b>Gross Total</b>	<b>2461933</b>	<b>6068062</b>	<b>8,529,995</b>

*Source : LAG Bus Management , BRT Operator , Ikeja Lagos.*

Table 2 present the total Bus Mileage for all the seven (7) traffic corridors for the BRT Busses between 2007 and 2008. The table shows that the total vehicle mileage for all routes for the period under consideration was 8,529,995km. Berger TBS/CMS has the highest vehicle kilometreage covered with 3,448,188km followed by Ikorodu CMS and Ketu with 1,644,566 despite its operation for barely a year. The information in table 2 followed the trend of statistics on passenger magnitude along the traffic corridors. A further analysis of the information in table 1 and 2 shows that the average passenger mileage covered by BRT Commuters along the existing routes in between 2007 and 2008 is on the average of 1.2km which translate to an annual average of 0.6km per passenger for the period under consideration.

## 8.0 Road Traffic Accidents Involving BRT Buses

**Table 3: Road Traffic Accidents Involving Lag Bus**

Month/ Year	2007	2008	
<b>Jan</b>	-		
<b>Feb</b>	16	1	
<b>Mar</b>	5	-	
<b>Apr</b>	3	1	
<b>May</b>	-	-	
<b>Jun</b>	-	1	
<b>Jul</b>	6	1	
<b>Aug</b>	9	5	
<b>Sept</b>	2	6	
<b>Oct</b>	-	6	
<b>Nov</b>	-	3	
<b>Dec</b>	-	-	
<b>Total</b>	41	24	65

*Source: LAG Bus Management, BRT Operator , Ikeja Lagos.*

Table 3 shows information on the level of accident involving the BRT buses. A total of 65 road traffic accidents were recorded among the buses. The highest of which was recorded in 2007 and in the month of February (see Table 3). The rate of accident among the BRT buses is quite low when compared with the rate of accidents among the commercial drivers before the advent of BRT Buses. The rate of accident within the two years of Operation when compared with vehicle kilometreage travelled is infinitesimally low and it is important to note that the rate of accident is on the downward trend. Average accident preponderance in relation to kilometreage travel by BRT buses for the period is 0.000008 (Total Accident/Length of trip by buses) while the rate of accident exposure of passenger to accident in the BRT buses is 0.000006. (**Total Accident /No of Passengers**). The occurrence

of accident along the BRT lane has been attributed to interference from disobedient drivers particularly during the pick hours or sometimes at road interception .

## **9.0 Findings of research on Users Perception**

The outcome of focus group discussion conducted on selected staff and passenger on the evaluation of the operation of the BRT scheme reflected that the staff are aware of what it takes to render effective service in the overall interest of the passengers and the programme in particular. The services of the BRT buses in the course of intra city trips in the State has relieved the agonies encounter by the passengers and commuters

The BRT passenger's and staff identified the following indices as the bane of effective service delivery as panacea for sustainable urban commuter intra city transit:

1. Identification of customer circumstances and needs
2. Speed, timeliness, accuracy and hassle free services
3. Consciousness of customer divergent views and complexity of behavioural tendency.

The workers appreciates the need for service improvement as the current level of service delivery left much to be desire in meeting customer satisfaction with regard to the overall objective of the scheme .

The staff identified the following problems confronting the BRT outfit:

Poor Road network; inadequate operational buses; Lack of motivation; Hooliganisms on the part of passengers ; Ineffective bus maintenance ; Traffic congestion ; Inability to meet service demand ; Bad driving habit among drivers ,Hot and suffocating circumstances in the buses in the afternoon due to tropical weather ; Lack of professional conduct among staff , accident occasioned by disobedient to the rule of none interference by other motorist.

The following were offered as practicable solution to the identified problems above :



Improved road network ; Acquisition of more Air-conditioned buses ; Adequate orientation on the part of passengers ;Staff motivation for optimal performance; Security of staff and passengers ;Provision of adequate working tools e.g. tickets; Effective maintenance of buses ;Effective monitoring of bus lanes; Proper enforcement of basic principles of bus lane dedication ; Professionalism should be the watch word , revitalization of the concept of intermodal strategy in the state consider the available potentiality of the in providing support for intermodal transportation.

The outcome of investigation of users' perception shows on the average that users are generally satisfied with the operation of the BRT Scheme. They see the scheme as a welcome development in the process of urban passenger movement in a city with extensive commuter transportation demand.

However , investigation revealed that the scheme has not in any way meet the expected capacity of operation as the scheme still contends with bottlenecks associated with general road transport operation despite moving on dedicated lanes . The scheme still has to contend with traffic holdups, overloading of buses, occasional accidents, and reckless driving attitude among drivers on the scheme, long waiting time at bus stops.

The preliminary investigation also revealed that the scheme do not take into consideration any form of support for students particularly secondary school students as they are made to pay the same fare with other commuters . This is alien to the scheme has been practiced in other parts of the world where the scheme is properly been entrenched.

The scheme as matter of urgency should embark on aggressive route expansion to accommodate routes that have not been accommodated. Efforts should be made to develop the park and ride scheme which is an important feature of the scheme. The passive nature of

the park and ride scheme is currently responsible for the partial impact of the scheme as very few commuters with car ownership status patronize the scheme.

## **10.0 Conclusion**

Lagos state with its mega city status and tendency should have a well integrated transport system to meet the challenges of intra city trips, Hence the development of commuter passenger scheme with the development of other modes of transport in which Lagos when compared to other parts of the country has a comparative advantage. Hence the scheme involving rail and inland water transportation should be considered. Lagos state has the potential to promote a competitive mobility device system considering the strategic location of Lagos , all it requires is to ensure a ,more efficient use of the urban transport infrastructure by taken advantage of the presence of natural phenomenon – water in the implementation of appropriate plan to cater for traffic /urban commuting in most acceptable manner.

## **References**

- Adesanya, A. O. and Adeniji, S. A. (1998) “Sustaining urban public transport in Nigeria: critical issues and remedies” in Freeman & Jamet (eds.) *Urban Transport Policy*. Balkema, Rotterdam, pp. 775-781
- Agbola. T. and Agbola. E.O.. (1997) “The Development of Urban and Regional Planning Legislations and their impact on the Morphology of Nigerian Cities”. *The Nigerian Journal of Economic and Social Studies*, Vol. 39, No. 1, p. 123-144.
- Agbola, Tunde (1989) “Perspective planning: the urban and regional planning dimensions” *The Nigerian Journal of Economic and Social Studies* Vol. 31, Nos 1, 2 & 3

- Arosanyin, G.T. (2001) , “The cost implications of road accidents on the African Economy  
“paper presented at the World Conference of Transport Research , July 22-27 at Seoul  
South Korea.
- Auclair, C. (1999) “Measures of Travel time in cities” *Urban Age*, 6(4), pp.26-27.
- Ayeni, B. (1998) “Urban Geography” in Areola Olusegun and Okafor I. Stanley (eds.) *50  
years of Geography in Nigeria – The Ibadan story*. Ibadan University Press, Ibadan, pp. 75-  
97
- Brain Turton and Richard Knowles (2000) “Urban Transport Problems and Solutions ”in  
Brain Hoyle and Richard Knowles,(eds) *Modern Transport Geography John Wiley  
and Sons*, New York., pp 135-157.
- BrainHoyle and Richard Knowles (2000) ”Transport Geography An Introduction”* in Brain  
Hoyle and Richard Knowles,(eds) *Modern Transport Geography John Wiley and  
Sons*, New York., pp 1-12 .
- Dimitriou, H.T. (1990) ”The Urban transport planning process” in Dimitriou , H.T.(eds)  
*Transport Planning for Third world cities* London: Routeledge, 144-183
- Egunjobi Layi. (1999) *Our Gasping Cities* An Inaugural Lecture delivered at the University  
of Ibadan on Thursday, 21<sup>st</sup> October .
- Egunjobi Layi. (2002) “Planning the Nigerian Cities for Better Quality of Life” in  
Onakomaiya S.O. and Oyesiku O.O. (eds). *Environment, Physical Planning and  
Development in Nigeria*, Department of Geography and Regional Planning, Olabisi  
Onabanjo University, Ago-Iwoye, Nigeria, pp. 89-107. 24
- Filani, M.O. (2002) “Mobility Crisis and the Federal Government’s Mass Transit  
Programme” in
- Filani M.O. 1994. “Transportation”. In Filani, M.O., Akintola, F.O. and Ikporukpo, C.O.  
(eds.). *Ibadan Region*. Ibadan: Rex Charles, 1994. pp.179-190.
- Gbadamosi K.T. (2002) “Traffic Regulation and Traffic Accidents in Nigeria- A Spatial  
Analysis “ *An Unpublished Ph.D Thesis Submitted to the Geography Department  
University of Ibadan*.
- IFRA (2002) “Echoes, Cities and Artists in Nigeria” Ibadan: French Institute for Research in  
Africa (IFRA), pp. 2-3.
- Jacobs G. .A . Aeron- Thomas, and A. Astrop (1997), “Estimating global road fatalities” TRL  
Report 445, Transport Research Laboratory: Crowthorne
- Mabogunje, Akin I. (1968) *Urbanization in Nigeria*; London: University of London Press  
Ltd.

- Ogunsanya Ade A. (2002) *Makers and Breaker of Cities*. The Fifty-ninth Inaugural Lecture delivered at the University of Ilorin on Thursday, June 27.
- Osita Nwajah; Ibim Semenitari; Anene Ugoani; Stephen Ubanna; Dele Oyewale and Ann Ariole (2003) "Infrastructure: A Rotten Foundation". *TELL Nigeria's Independent Weekly* No. 23 June 9, pp. 47-50.
- Oyesiku, O.O. (2002a) *From Womb to Tomb*. 24<sup>th</sup> Inaugural Lecture, Olabisi Onabanjo University, Ago-Iwoye, 27<sup>th</sup> August.
- Oyesiku O. K. (2002b) "Policy framework for urban motorcycle public transport system in Nigerian cities" in Xavier Godard and Innocent Fatonzoun (eds.) *Urban Mobility for All*, Lisse: A. A. Balkema, pp.255-261.
- Asiyanbola , R.A 2007 " Intra-urban transportation, gender and psychological distress in developing countries: Nigeria" Paper presented to the PRIPODE workshop on Urban Population, Development and Environment Dynamics in Developing Countries Jointly organized by CICRED, PERN and CIESIN with support from the APHRC, Nairobi Kenya June 2007.
- Vandu-Chikolo I. (2004) "Urban Transport Infrastructure" in Vandu-Chikolo I, Ogunsanya Ade A. and Sumaila A. G. (eds.) *Perspectives on Urban Transportation in Nigeria*. A publication of the Nigerian Institute of Transport Technology (NITT), Zaria, pp. 70-86