

Lagos is located in the south western part of Nigeria. It is one of the 36 states in Nigeria and is the only one city state in the country. It is bounded by Ogun State to the north and east, to the west by the Republic of Benin and to the South by the Atlantic Ocean.

Despite being the smallest state in the country in terms of land mass, Lagos has the highest population in the country with an estimated population of 21.7 million inhabitants in 2012 (Lagos State government, 2013). It is the second largest city in Africa, after Cairo in Egypt and one of the fastest growing in the world (Lagos State Government, 2013). Lagos was the capital city of Nigeria until December 1991 when the seat of the federal government was relocated to Abuja due to several problems, particularly traffic congestion, overcrowding and lack of space for areal extension (Osoba, 2012). This continual increase in population growth has consequently led to an increase in the rate of suburban growth around Lagos resulting in increasing need to travel. The outcome of this is the chaotic traffic situation which has become a major problem with which Lagosians have had to live.

The extremely high population of Lagos arising from the fact that the city has remained the commercial capital of Nigeria has continued to put a lot of pressure on her infrastructure, including public transport. For instance, The area covered by Lagos is put at about 0.4% of the total Nigerian landmass but it accommodates about 25% of the total national vehicular traffic (Olagunju, 2015).

Lagos was about the only megacity in the world without a functionally efficient public transport system prior to the introduction of the Lagos BRT (Mobereola, 2009). The public transport system consisted of a fleet of 75000 minibuses popularly known as 'danfo', a handful of minibuses (molue), taxis being referred to as kabu-kabu and a huge number of commercial motorcycles known as 'okada' (Mobereola, 2009).

This resulted in uncoordinated, unreliable, expensive and grossly inefficient transport system that left passengers at the mercy of individual operator. The impact of this inefficient transport system was obvious in virtually every sector of the city life thereby making the transport system grossly unsustainable.

4.0 Previous efforts at addressing traffic congestion in Lagos

Realising the magnitude of the transport challenges bedevilling the city, some of the earliest measures put in place to address the problem included among others; the decentralisation of government offices in charge of transport; construction of overhead bridges at congested road junctions; Opening up of new roads and widening of existing ones; the introduction of car restraints by number plates (Ogunsanya, 1984). Unfortunately none of these has been able to adequately address the traffic situation of Lagos.

Realising the fact that all the previous efforts had not recorded any significant success and that the city is still struggling with a dearth of public transport system, the State government under the leadership of Governor Bola Ahmed Tinubu introduced the Lagos BRT and the first phase was opened on 17 March, 2008 (Mobereola, 2008)

5.0 The Lagos BRT-LITE

Bus Rapid Transit (BRT) is a “*bus-based mass transit system that delivers fast, comfortable and cost-effective urban mobility*”(Wright, 2004:1). It has emerged as a famous means of urban transportation service across the world and most specifically in the developed countries of the world. It is considered a cost-effective, efficient, effective and reliable alternative to the urban rail service that requires huge investments (Cervero, 2013; Ogunkoya, 2008; ITDP, 2007). The design is such that it provides exclusive right-of-way lanes and excellent service (Wright, 2004).

The Lagos BRT was introduced to address the inadequacy of the transport system of the city (Mobereola, 2009). It was designed to be operating along a 22 km corridor running radially out of the Central Business District (CBD) on the Lagos Island, crossing over a bridge to the mainland and continuing into the extended mainland areas of the city (Mobereola, 2009)

The scheme is “aimed at delivering a transport system that will meet the needs of local users, while improving citizens’ quality of life, economic efficiency, and safety within a clearly defined budget” (Mobereola, 2009 ;1). It was designed to run on dedicated lanes so as to be free from interference (Ogunkoya, 2008),

The Lagos Area Metropolitan Authority (LAMATA) was established to undertake the Lagos Urban Transport Project (LUTP) with the motive of improving transportation in Lagos. One of the measures adopted was the BRT LITE which was to be a cheaper alternative with a relatively shorter implementation period with the following objectives:

- *Reduce traffic congestion, improve air quality and meet the mobility needs, particularly of the less privileged and the poor in Lagos metropolis:*
- *Build a roadway based system that looks and behaves like a subway, offering high capacity rapid transit services but on dedicated lane(Ogunkoya, 2004:848)*

According to Mobereola (2009), the BRT infrastructure is made up of physically segregated lane along 65% of the corridor length, exclusive BRT lanes demarcated by paint along a further 20%, and buses travelling with mixed traffic for 15% of the route

As bogus as the Lagos BRT seemed, it was still short of the standard of a public transport system befitting a city of the status of Lagos hence the need for improvement. Adapting the concept of the Bogota pattern of BRT which incorporates traditional modes of transport as well as offering a better bus transit system is thereby suggested for the Lagos megacity.

6.0 The Bogotá’s TransMilenio

Bogota undertook an impressive land use and transport system project which is the largest transport investment in public transportation in the city in the early 2000s. It began operating on 12 December 2000 (Valderrama and Jorgensen, 2008). It was intended to help tackle the transport crisis confronting the city at that time (Bocarejo et.al, 2013; Suzuki, et.al, 2013; Hidalgo, 2002). The city had a population of over 7 million inhabitants with an awkward public transport system consisting majorly of fleets of privately owned buses (Echeverry et.al, 2004). In its first phase, the system was transporting 790,000 passengers daily, approximately 12 per cent of the city’s population. The phase 1 and 2, according to Hildago et al.(2012) have the following characteristic features:

- Length of Bus-Only Lanes: 84 km
- Length of Feeder Routes: 663 km of routes
- Stations: 114
- Trunk Vehicles: 1262 articulated buses 10 bi-articulated buses
- Feeder Vehicles: 519 conventional buses (12 m)
- Feeder Routes: 83
- Payment System: Contactless smart card
- Control Center: On-line real-time supervision
- User information: fixed signage and dynamic display panels
- Total passengers: Average of 1.7 million on weekdays
- Users of feeder routes: 48% of total users
- Fare: Flat rate COL\$1700 per trip (USD 0.94), including transfer (Source: Hidalgo et al, 2012:133)

The project is a mass transit project integrating BRT and feeder buses with the BRT operating on segregated lanes and with buses having priority at road intersections making them faster than other cars. It comprises of an average of about 42 km of primary roads dedicated to bus-only traffic and was managed by a single institution (Valderrama and Jorgensen, 2008). Other measures taken to enhance the success of the scheme included: Extension of routes to improve access in poorly served areas; construction of public squares, improvement of sidewalks and the development of pedestrian networks which have also enhanced the quality of the public realm; new text message information system and better on-board services and a host of others.

The has become the first BRT system to achieve high performances that were previously thought only to be achievable with heavy rail system (Valderrama and Jorgensen , 2008). Table 1 gives a comparison of the Lagos BRT lite and the Bogota scheme. From this table, it is observed that the success of the scheme stemmed directly from its high level of sophistication.

Table 1-Comparison between the Bogota and the Lagos BRT system

Bogota	Lagos
BRT and feeder buses	BRT LITE
Integrated ticketing system	No integrated ticketing system making it more expensive and limiting the choice of passengers
New scheduling and control technology including user information system	Characterised by uncertainty due to lack of customers information making it users unfriendly
Integrated with pedestrian and bicycle infrastructure thereby promoting environmental sustainability and enhancement of public realm	No definite provision made to incorporate traditional modes of transport and land use integration
Adapted to the need of people with disability making it more socially inclusive	No consideration made for people with disability
Stations located in the middle of the road for easy passenger transfer	Not integrated with other modes of transport
Bus stop closely spaced, equipped with surveillance cameras, infrastructure bridges , pedestrian crossing and traffic lights for easy passenger use	Bus stops more widely spaced with no adequate provisions for safety and comfort

7.0 Suggested solutions to the transport situation in Lagos

Integrating transport and land use planning- With the realisation that the integration of transport planning into the overall city planning process is vital to the functionality of cities (Kodukala, 2018; Suzuki et al. 2013), it is important to work out how transport planning will be incorporated right from the inception.

7.1 Transit Oriented Development: in many cities of the world with high density land use pattern, transit oriented development has become the standard practice adopted in dealing with congestion problem in these places (Salat & Olliver, 2017; Cervero, 2004; Belzer & Autler,2002;). Transit oriented development has many different definitions. It nevertheless focuses on areas within what is considered as a walking distance from a transit station. Within such area, mixed land uses, increased density, pedestrian friendly street, and improved potentials for inter-modality is usually promoted. Enshrined in this planning strategy are the principles of collaboration, local representation and accountability. The private sector is usually involved in a collaborative manner to invest in both business and residential developed situated around the area of interest. In this manner, the planning process extends beyond the planners to include private sector. (Salat & Olliver, 2017)

7.2 Jobs-housing balance: Jobs-housing imbalance has been found to cause negative impacts such as longer commuting, greater traffic congestion and other negative transportation externalities (Lee, 2012; Cervero, 2006; Giuliano, 1991). The degree of jobs-housing balance is a ratio of the number of jobs to the number of resident workers (Cervero, 1989). When there is a highly unbalanced situation, there is the excess of commuting in one direction with the resultant excessive average commuting length in that zone (Giuliano, 1991; Cervero, 1996; Cervero, 1989). Zoning land use pattern has a way of promoting this imbalance. So also is the case, for example, in suburban growth scenario promoted by green belt where spatial separation of residence and employment locations means that people have to commute longer. Measures that reduce commuting, such as mixed land use, tend to improve jobs-housing balance and reduce transport externalities. The term “concentrated decentralisation” has also been used to describe how planners may respond to a city undergoing population decentralisation process (Loo and Chow, 2011). It involves providing supporting policies that help achieve job decentralisation in a city undergoing population decentralisation. This was found to be successful in Taipei in achieving shorter and more intra-zonal commuting.

7.3 Good parking management strategy/ parking restrictions-Parking is a necessary component of transport system (Litman, 2012). According to Austroads (2008), parking can be defined as ‘the act of stopping a vehicle and leaving it in the one location for a period of time, whether or not anyone remains in the vehicle’. It allows for safe storage of vehicles by drivers and affords them the opportunity of carrying out their intended activities (Austroads, 2008 indiscriminate on-street parking impedes free flow of traffic thereby contributing to congestion. In order to encourage the use of public transport and discourage private car use in Lagos, there is the need to discourage on-street parking, provide good parking facilities and make users to pay directly for using parking spaces. Litman (2012) did a comparison between what parking was believed to be as against the new conception of parking as the old and the new planning paradigm and suggested that embracing the new paradigm will be helpful to transport system in this age. The table below is from Litman, 2012.

Table 2- old and new parking paradigm compared

Old parking paradigm	New parking paradigm
Parking problem means inadequate parking supply	There can be many types of parking problems, including inadequate or excessive supply, too low or high prices, inadequate user information, and efficient management.
Abundant parking supply is always desirable	Too much supply is as harmful as too little
Parking should generally be free, funded indirectly, through rents and taxes	As much as possible, users should pay directly for parking facilities
Parking should be available on a first-come basis	Parking should be regulated to favour higher priority uses and encourage efficiency
Parking requirements should be applied rigidly, without exception or variation.	Parking requirements should reflect each particular situation, and should be applied flexibly.
Innovation faces a high burden of proof and should only be applied if proven and widely accepted	Innovations should be encouraged, since even unsuccessful experiments often provide useful information.
Parking management is a last resort, to be applied only if increasing supply is infeasible	Parking management programs should be widely applied to prevent parking problems
“Transportation” means driving. Land use dispersion (sprawl) is acceptable or even desirable.	Driving is just one type of transport. Dispersed, automobile dependent land use patterns can be undesirable.

7.4 Improving on the BRT to the level of the TransMillenio Scheme- Public transportation in Lagos will be greatly improved if the Lagos BRT could be improved upon to meet up with the standard of the Bogota’s scheme. This will make it to become attractive to passenger and also increase its efficiency and effectiveness as indicated in Table 1 above.

8.0 Conclusion

The city of Lagos, with its ever increasing population is currently being faced with terrible urban transportation challenges. Although several attempts have been made to alleviate the problem, it is obvious that most of the efforts have proven to be either ineffective or even counterproductive. For instance, it has been discovered that building more roads will only promote car dependence and ultimately create more problems while approaches such as restriction of car use based on odd and even numbers did not work because most families decided to have more than one car that were registered in both the odd and even numbers which then qualified them for driving a car every day.

To put a lasting solution to the problem, this paper suggests synchronising transportation planning into land use planning. It concludes by suggesting the introduction of a BRT scheme that is the magnitude of the Bogota's TransMilenio scheme in order to make public transport use attractive to Lagosians.

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