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The role of multimodal transportation in city sustainability: A case study of Lagos state mega city

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Abstract
As human populations become more and more urban decision-makers at all levels face new challenges, related to both scale of mobility provision and the increasing complexity of services, needs within the complexity of the city and the roads networks that connect them. These problems may take a unique aspects in the city with different, political, cultures, policy, institutional frameworks at different levels, stages of development, types of vehicles, different modes that they frequently have in common, an origin in movement Interaction of operations and in environmental systems. The result which affects their relationships in decision making on dynamic evolution. Systems approaches become recognized as critical means to understanding and addressing such transportation problems, such as those related to movement of people, distribution of goods and services, human health wellbeing, management of congestion, time valve utilization, multimodal systems, connectivity's for cities is an area where such approaches operates. The role of modern roads and duralization of road with transport information technology systems and connected to rail system, inland waterway jetties, local airport in multimodal systems as critical to understand and solve such complex problems in city sustainability transportation systems. The finding seeks to summarize links between roads, rail, waterways, and airport in cities and outline two main elements of system approaches, analytic methods to resolve complexity, intermodals and multimodal roles transportation in mega cities. Using Lagos State as a case study of sustainable city, urban socioeconomic and multimodal transportation system in developing nation. The research shows the impacts of multimodal transport systems in Sustainable city.

Keywords: multimodal transportation, system theory, sustainable city, population, economic growth, mobility

Introduction

No discussion about the city sustainability or mega city management structure can take place without an overview of Urbannization, multimodal transportation which has been one of the dominant trends of economic and social change of the global development in the developing world. The fundamental changes in the socio-economic environment of human activities as urbanization management for sustainability involves new forms of employment, economic activity and lifestyle for safety and security of both human, industries, transportation, distribution, environmental health, comfort ability, accessibility, controls and good governing process which is directly correlated with city sustainability in urbanization management.

The current global trends indicate a growth of about 50 million urbanites each year, More than 90% of that growth occurs in developing countries which places intense pressures on sustainable infrastructures, particularly transportation. By 2050, 6.5 billion people, about two thirds of humanity are likely to be in city or urban residents. Urban city includes a whole continuum of urban spatial structures, ranging from small towns to large urban agglomerations. (Hidalgo, D, Gutierrez, L. 2013) [6]. Some technical limitations, road, utilities are much an impediment in large cities management due to dysfunctional, mainly because as city size increases the rising complexities are not effectively coped with managerial expertise.

These are reflected in the centrality of city activities, which can be related to the spatial accumulation of economic activities or the accessibility to the transport system, Terminals, such as ports, Train stations, railyards, and airports are important nodes around which activities agglomerate at city level. There is need for linkages, in the city these are the infrastructures supporting the flows from, to and between nodes. Depending on their nature, urban nodes and linkages provide for a functional connectivity for interdependent urban functions related to trade, production and telecommunications. (Dimitriou H, Gakenheimer R. 2011) [3]. Urban transportation is thus associated with a spatial form which varies according to the mode being used.

In city sustainability, transportation plays an active role for continuous development and total quality management of the city sustainability, the act of transportation involve many steps to be able to sustain any mega city. Transportation planning is the art and science of providing and managing transportation facilities in a manner that ensures an efficient movement of commuters and freights within a given city. It is a science that seeks to study the problems that arise in providing transportation facilities in an urban setting and to prepare a systematic basis for planning such facilities (Kadiyali 2002) the transportation planning process is made up of five stages. These are:- (i) Survey and analysis of existing conditions, (ii) Forecasting and analysis of future conditions and plan synthesis, (iii) Evaluation (iv) Plan adoption and implementation and (v) Monitoring. The transportation and land use:-It is now generally agreed by transportation planners that the land use pattern of a city is interrelated with the physical characteristics of its transportation network. Some of the major urban land use typologies include:- Residential land use, Industrial land use, commercial land use, public / semipublic land uses, recreational and use and circulation or transportation. It is

widely held that land use generates traffic. In the classical urban land use typology, retailing occupies the centre of the city because it can outbid other potential uses. This is so because it relies on accessibility ore than other land uses.

Transport network analysis is of paramount interest to the transportation planner because transport flows take place on transport networks. Transport flows can be defined as the movement of goods and services between places. Interaction or transport flow, especially urban transportation, usually takes places on roads or tracks which form a definite network in the urban area, or in a system of cities. In a more complex network involving a larger number of nodes and with possible alternative routes between nodes. Road transport is the most dominant mode of transportation in Nigeria. It accounts for over 90% of the total mode of transportation in the country. The rapid growth in Lagos State's road system and its attendant problem of maintenance and accidents constitute a quandary to transportation planners. In the urban areas, road are usually constructed and maintained by the existing three tiers of government:- The Federal, State and Local governments some strategies are usually taken into consideration before urban roads are designed,(Owoputi A.E. & Salaam T.O. 2018) [14]. This is to ensure that the road that is proposed is functional and efficient. The major roads are usually 3-1 one roads with each lane measuring 3m. The importance of transportation to the economy of nations has been widely recognizes. The higher the level of transportation facilities, the greater the potency of economic wellbeing of the nation.

The greatest boost to road development in the world was provided by the invention of the internal combustion engine. The road transportation complements other modes of transport such as rail, water and air because of it flexibility and ability to render door to door services (Bergerhott, J; Pershon, J. 2013). In order to ensure that all travel – patter and land use data relating to the transportation planning process are collected in an efficient and economic manner, the area to be studied must be demarcated by a boundary or external cordon line, the give rise to four types of movement:-

a. **External-Internal movement:** The movement has an origin outside the external cordon, and a destination with the cordon.
b. **External-External movement:** This type of movement is also referred to as "Through" movement, The origin and destination zones lies outside the area enclosed by the external codon.
c. **Internal movement:** Movement have both their origins and destination inside the area enclosed by the extend cordon.
d. **Internal-External movement:** Here movement originate within the area defined by external cordon, and have a destination beyond it.

Consequently attention is now being focused all over the world on the use of traffic management measures, which strive to utilize existing transport facilities with a view to minimizing cost (both social and economic) while at the same time maximizing benefits.

The traffic management ensures that the overall best use is made of existing transport facilities subject to the constraints of environmental preservation and public acceptability. Transportation in spite of it laudable merits, sometimes exacts some negative externalities on the environment and by extension, on urban residents. There are two deleterious effects of urban transportation on the environment are noise pollution, and traffic queues. Noise, which is unwanted sound, is a by- product of the operation of transportation vehicles, long and short term land use and socio- economic changes, water pollution, run off changes as well as vehicular and pedestrian queues at petrol service stations. Road intersections and bus-stop. The major source of the pollutant is the exhaust gas. The exhaust gas is made up of carbon dioxide, water vapor, oxides of nitrogen, lead compounds, carbon particles (smoke) and un- burnt petrol. Traffic noise attracted the attention of municipal authorities and urban dwellers. It is a subset of a set of urban blare generated from a multiplicity of sources. The relative importance of each source depends on the size and type of vehicle, its speed and the load it carries and it level of maintenance (Menkiti 2001) [9].

Transportation planning and Management;

The importance of transportation to the sustainability and economy of nations has also been widely recognized. It has been argued that the level of transportation in a country is commensurate with the level of economic development of that country. The higher the level of transportation facilities, the greater the potency of economic wellbeing the nation(Reff.no 5) Transportation planners cannot but be interested in the patterns of movement because it deals with how and by what made people, goods and services or information move space. Therefore in order to be able to plan adequately and effectively, for movement within cities and for its sustainable management, it needs to understand pattern parse why movement takes place and through which modes such movement occur. Traffic surveys and analysis are needed for scores of purposes for instance number of vehicles, their direction of movement, the commodities they carry, their types, weight and the caliber of commuters.

There are three important phases in traffic survey:-

a. To formulate the goals and objectives; The goals and objectives must be related to the resources at the disposal of the researcher. The time span, budgetary constraints and the wishes and aspiration of the people.
b. He planning of the relevant surveys, this deals with what type of surveys must be conducted or carried out.
c. It involves analysis and forecasting to cover a pre-determined period. There is need to note for city sustainability required:- (i) The inventory of existing conditions in terms of population economic activities, vehicles ownership, present trip generation pattern, existing land uses and available financial resources. (ii) There is for an estimation of future growth in terms of population growth trend, the economic forecast, growth in vehicle ownership and likely change in land use-pattern.
d. Bus traffic management schemes are two categories and according to (Adeniyi 2010). These are (i) measures that separate buses from other road users. (ii) Measures that give priority to buses over other road users. (iii) Priority at road junctions for example exemption of buses from turning prohibitions. Protection of bus stops to enhance the smooth pack up and discharge of passengers for example prohibition of parking in and around bus stops. Use of traffic regulations to reduce traffic in certain parts of the city, for example collar zones, park and ride or area

licensing. (Reff. No, 6).

This strategy involves the park and ride concept:- whereby a commuter parks his car at a collar zones and join a bus to CBD area. Another related strategy is "Kiss and Ride" a wife drops the husband at the road side or collar zone and he then picks a public transport to his destination at the CBD area. Measures which separate buses from other road users, These are:- Bus-lanes bus –only-street, bus way. City sustainability require a massive amount of data especially when model- building and prediction are intended, such data should be measurable, stable over period and should also be easy to forecast accurately. (Okoko 2006). Transportation planning data are usually collected on traffic volume, travel pattern, parking, socio-economic characteristic of commuters.

Transport traffic volume study in traffic volume studies provide planner with vital information on the amount of usage of the various categories of roads in the city. This type of information is usually helpful in setting road design standards in the proper classification of city road types and also in improving and maintaining the road in the city for sustainable operation and effective productivities in economic activities that sustain city sustainability, (Brussel Belgium 2006). Registration number survey is the registration number of vehicles and recorded as the vehicles pass each survey station. A good transportation survey is usually limited to the collection of origin- destination data for such vehicles as trucks, trailers, lorries etc. the impact of good transportation on the functioning of the city transport system are that the calculation of the passenger car equivalent and the longevity of the city roads, movement, traffic control and security and safety which are of prime importance to transportation planner in city sustainability. (Reff, 8).

Factors affecting choice of Public Transport Policy Diagram

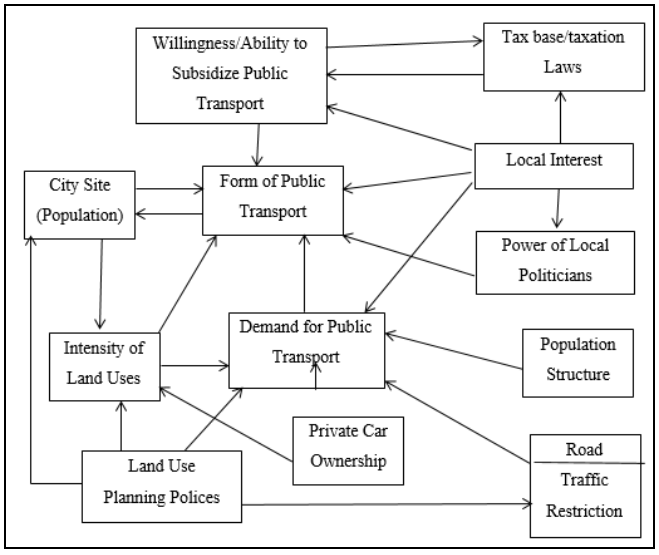

Fig 1

The traffic control and management

One of the major issue in the city sustainability is traffic control and management, it is an objective of transport planning to ease the movement of passengers and goods on the city roads, however in many towns and cities all over the world, there is an undesirable degree of traffic congestion on city roads, the provision of new roads is often expensive and most municipal governments usually consider the option of widening existing roads and this involves the destruction of houses and properties. The widening of roads and the concomitant destruction of building are not necessarily the panacea needed in controlling traffic congestion on city roads (Fadare 1998) [4].

The use of traffic management measure, which strive to utilize existing city transport facilities with a view of minimizing cost (both social and economic) while at the same time maximizing benefits. This ensures the use of transport facilities subject to constraints of environmental preservation and city sustainability, (United Nation 2011).

Traffic Management Techniques: -

1. Tidal flow or tidal traffic system
2. On way system
3. Pedestrian safety measures
4. Prohibition o- street parking
5. Improved junction control measures
6. Pedestrianization measure
7. Bus priority schemes.

The Literature Review Concludes

1. * Multimodal transport infrastructure and connectivity can facilitate trade expansion, attract foreign direct investment, speed up the industrialization process, facilitate regional integration and accelerate the process of economic growth.
2. * A number of factors can either facilitate or act as barriers to transport connectivity and multilateral trade in the general BRT context, such as physical topographical factors, legal and regulatory barriers. Many barriers could become facilitators. If resolved could become facilitator.
3. * Transport infrastructure and connectivity is generally lower in the BRT system compared to the other system.
4. * There is a positive and statistically significant relationship between transport infrastructure and connectivity and bilateral trade and motilities.
5. * In city with BRT and rail connection with improved transport service quality always have large impact on sustainability.
6. * The relationship level of investment in transport infrastructure in a city increases trade volumes and economic activities.

Methodology

With must city sustainability management this research employ and discourse two major ones.

One-way system: - These are where traffic movement is permitted in only one direction, it is a traffic management measure which aims at improving traffic flow, thereby reducing delays. One-way traffic streets serve as the least expensive method of alleviating traffic conditions in a busy area when it is combined with other techniques like traffic signals, prohibition of on street parking, waiting and loading, it is very efficacious in improving traffic in congested areas. It removes conflict between two opposing streams of traffic. An advantage of one-way streets is that they reduce the number of points of conflict at junction, it promotes traffic safety, reduction of accidents and delays. It ensures about 50% efficiency in traffic flow and reduce accidents. It increases the overall journey on the affected

street and reduces rate of air pollution arising from fumes from the exhaust pipes of vehicles. Its noted that some motorist are bound to disobey the one-way road sign.

The Bus Priority Schemes

Buses has been acknowledge to be commons mode of motorized public transport in urban city centers throughout the world (Adeniji 1990) the utility of the bus transit system in any given urban city centers includes

a. Mobility for everyone, reduced traffic congestion
b. Positive impact on commerce and industry
c. Fuel saving and reduce pollution and
d. Safety

The qualitative research approach was developed to collect multiple source of evidence the qualitative case study allows to explore the behavior of humans in their natural settings, such as social cultural and political atmosphere in exist. A number of face to face interviews analysis as used in the study, which considering some suggestion. The researcher discussed the data through certain desirable numbers of information to obtain understanding, data about the influence of urbanization of Lagos city. The conceptual framework of the research methodology involving a sequential explanatory.

The Concept of City

A city has been defined as a place with homes complex in terms of functions (residential, industrial, commercial, administrative) and size. Cities are living entities and generative economy. Cities are extremely productive islands in a sea of what are often very dysfunctional or stagnant economic, but they are increasingly finding their way to connect with the larger global economy. A city has a population of more than 5000,000 (US Standard) cities are characterized by the availability of social amenities such as road electricity, water, drains, daily markets, educational institutions, waste disposal system as against rural settlements and small and medium towns. In Nigeria cities the city level economic development is slowly shifting away from industrial activities to more sophisticated Technology knowledge base systems. Several cities have built on newly developed technologies to emerge as major financial centers. Whereas citied are in the process of adapting new economic realities. (Newman, p, Kenworthy J. 1999) [10]. Nigeria cities are in the midst of restructuring space of city sustainability, in terms of both use and form. Residential areas in the central districts and sub-central of such cities as Lagos, Port-Harcourt, Warri, Kano and Kaduna are being transformed into commercial space, shopping malls, have sprung up replacing old pattern of trading and increasing rate of transportation and mobility access for goods, people and information in other to sustain the development of the various cities and keep activities going effectively. (Owoputi A.E. 2016) [12].

The Sustainability of Lagos Mega City, in Nigeria.

Lagos mega city has seen an impressive number of city innovations. It also brings more information to planner level decision makers, who are often constrained by their lack of systematic data on problems. This new information and methods becomes the patrimony of cities and of the scholars and research institute that becomes part of city managers and policy networks. The urban growth dynamics of Lagos city comprise the big changes in the economic state as a result of political events and commercial businesses that took place in Lagos city. The state was formerly the federal capital off Nigeria until the Federal capital was move to Abuja in December 12th 1991. In it environment, and a boom in sea-port and airport business. The prosperity of the city also led to high demand for establishment of new facilities and services, this encouraged growth of the city, due to which most of new areas sprawled along the coastline of the country. (Owoputi A.E and Kanyio O.A 2017) [13].

A city entrance which led to a significant change in the structure of the city. The wide spread uncontrolled building development in the vicinity of the city, especially into the surrounding coastlines due to this mass influx, a big change in the residential complexes style has been observed, the quality of urban city life and housing inadequate services and transportation problems have been the main characteristics of new urbanized area, particularly for periphery areas. The stability of Lagos mega city interns of security affects indirectly the city because of the sudden increase in population. The aforementioned prosperity reflected in many sectors of the city such as industrial and commercial activities, this accelerated the city growth and increase the mobility of goods and people with services for safety, security and comfort. Therefore, city sustainability pattern and its aspect critical instrument from an urban planning perception, transportation network, mode of transportation available, type of vehicle allowed, the multimodal arrangement of the transportation system.

Multimodal Transportation,

Multimodal transportation was first defined at an international level the preparatory process by the "1980" United Nation Convention on multimodal transportation as used at the convention "international multimodal transport means the carriage of goods by at least two different modes of transport on the basis of a multimodal transportation contract from one in one country at which goods are taken in charge by the multimodal transport operations to a place designated for delivery. Multimodal transport can also be defined as a comprehensive management of all available modes of transportation, such as Air, water, rail, road, pipeline and underground for effective and efficient movement of people and goods. It is the development of transport system beyond one leg basis system of transit. It can also be viewed as the development of transit system beyond the sea leg on a port to port basis to overland infrastructure. Modern international transport operation increasing require the use of combination of several modes of transport, interfaced together with the operation of comprehensive trade and transport documents.

Concept of Multimodal

The multimodal transport system is a combined transport system that stitches each roadway, rail, airway and waterway to produce an integrated travel solution within a smart city. It is not necessary for all types of transport system to perform under a single contract. Even if a minimum of two modes is integrated the system can be regarded as a multimodal transport system. Multimodal system is advancing in some of the rapidly flourishing cities like London and Singapore where the transport authorities serves as United public transport authorities to deliver seamless integration of multiple modes like metro, buses,

light rail, and taxis. Multimodal transport system including rapid bus transit, metro and light rail can get more convenient for commuters when they are connected with each other. The impact can further integrated with taxis and shear-mobility service such as walking, cycling, bike-sharing and car-sharing help connect the first and the last mile. (Owoputi A.E 2016) [12].

Technology and the private sector can be crucial drivers for the development of multimodal transport system. The fundamentally includes the introduction and development of integrated payment systems for multimodal trips the use of smart card. The multimodal transport system has the capabilities to overcome the first and the last mile challenges, increase accessibility for people living on the outskirts of the city and mitigate traffic and traffic-related issues that take place due to next day parcel delivery standard. Multimodal is a relatively new concept in transport sector, multimodality is the comprehensive management of all available modes of transportation such as: water, road, air, pipelines and rail for effective and efficient movement of goods and people. Multimodal freight transport emerged as response to change in marking and distribution requirement for all types of cargo. Multimodal transport system and their complementary development of sophisticated logistic system are phenomena of the fast changing world trade and commerce, "GLOBALIZATION". Nigeria like most other sub-Sahara African countries is deficient of the facilities for effective participation in the multimodal transport organization, crippling, inefficiencies and lack of service orientation of Nigeria's transport and telecommunication institutions, stands as a major hindrance to the application of multimodal system in the country.

Multimodal Transport and Economic Development

The increased multimodal transport is partly due to the tremendous economic development impact of transportation infrastructure on cities economics, since both transport and development are usually regards as closely related because each of them influence the fortunes and the relative rate of growth of the other. The increased capital investment in seaport, railways, aviation, highways and pipelines were aimed at stimulating the rate of economic growth and the city sustainability. (Haghshenas H., Vaziri M. 2012) [5]. Multimodal is the comprehensive management of all available modes of transportation such as Air, Water, Rail and Pipeline for effective and efficient movement of people and goods. It is the development of transport system beyond one leg basis system of transit. Multimodality transport system required the use of combination of several modes of transport, interface together with the operation of comprehensive trade and transport documents. It could be said that Multimodal transport means the carriage of goods by more than one or two different modes of transport from one place in a country at which goods are transported to a place of delivery.

Multimodality requires not only that goods be moved efficiently through combination of many modal networks, interface facilitate a good coordination between different modes e.g. goods shipped through the sea Kaduna with first get to Lagos port or Calabar port or any other port then transferred into track vehicle mode or railway mode to it final destination Kaduna thereby combining more modes, it may be first by ship into rail and later into track vehicle this type of combination need to be coordinated for safety and efficient delivery. It is an example of Multimodal system of transportation.

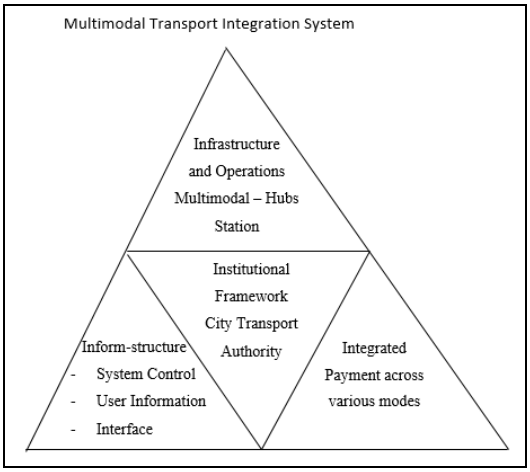

Fig 2

This type of transport system called multimodal is very difficult to practice in Nigeria due to many factors among which are: - Lack of facilities for effective operation, e.g. lack of Modern Technical equipment for off-loading at interchange points of each modes. This leads to crippling the rate of efficiencies and lack of service orientation of Nigeria transport industry. The poor telecommunication system is another hindrance for the operation of multimodal system in Nigeria. The problem of Institutional Authority and show or power also account for the poor multimodal system. Bureaucracy is a major hindrance to the application of multimodal system in the country. The problem of insufficient regulatory framework, at interface points and poor development of infrastructure account for set back of multimodal system in Nigeria. The problem of the users or the beneficiaries who are not aware of the importance and potential benefit in term of gains on time and cost with easy coordination gains on time and cost with easy coordination process and network communication that are accrue in the multimodal system hindrance the success of multimodal system in Nigeria. Also the problem of Monopolistic Authority by each of the different Agency also account for the difficulties e.g. airline does not believe that it has to cooperate with land or road or rail etc. for better services and greater dividend for its customers, also the port Authority does not consider road or rail in it planning process as a complementary partner bit it looks at rail or air transport as competitor for transport, all this made it very difficult for multimodal system to success in Nigeria. The inability to have enough fund for development is also another problem facing multimodal system. (United Nations 2019)

Multimodal development in recent times

In the last fifteen years, notable developments have occurred within urban mobility and sustainable transportation in the United State and other developed countries. As a result of the achievement, being car-free or car-light is becoming more common place. More automobile manufacturer is producing compact electric vehicles. That the future of our cities will depend on personal mobility and adding more cars is "Not going to work" the bicycle has undergone a

rebirth as a viable means of urban transportation and governments on all levels are using transportation funding to support public transit infrastructure.

With road and highways networks already struggling to meet transportation demand, more people are turning to alternative transportation modes. As more and more individuals are using public transit and shared-use modes to get around, transportation system are becoming cheaper and more efficient. Multimodal trip making has created a new demand for enhanced integration among transportation options.

Based on people's suggestion and feedback from the research, the city sustainability development strategy a draft conceptual plan and a drafts development road map could be developed for each of the cities. The main contents of these drafts will be: - a preliminary road network, land use zoning, building control regulations areas of future expansion of the cities. A second workshop suggestion on water supply, drainage system, roads and traffic, the environment, industry etc. to be incorporated into the development plan.

Based on the collated data from the working groups in each cities or district the draft plan could be shared with the district administration, municipal staff, elected representatives and all stakeholders. The plans should not be as a technical exercise by planners in isolation.

There is need for various input of their visions, as their involvement is pertinent to the planning process for any city sustainability.

- Cities should be clean, orderly and efficient.
- Infrastructure and services should be supplied to all groups especially Transportation of goods, people and information for successful city management.
- Taxes and levels wherever possible should be collected (or at least remitted) and fees for some services as well (water, electricity and sewerage) should be applied to house-hold receiving services for a city to be sustainable.

It is observer that there are many areas of the city sustainability that we make progress, but efforts towards achieving thus must depends on reliable and relevant statistics. Reliable and relevant statistics will mean that our government officials do not rely on foreign data on Nigeria for their own assessment. Newly elected officers on cities or urban regional planning in government requires training courses for new transport and traffic managers or staffs, regular meeting at which political leaders explain government policy and opportunities to explore various ideas and learn about new technology in traffic management in cities. It is said to note that official accident figures and data are poor and inconsequential, providing on basis for accurate time lost in traffic congestion, this poor assessment goes to the cost losses during accidents and both of good cost, human being lost-cost value of such people to the economic and their family and poor economic value management in the city urban and urban sustainability in particular.

The following suggestions are necessary for effective city sustainability organizing/reengineering of the city to have openness for city growth and development. The effectively facilitating the mobilization and sensitization of the stakeholders for effective transportation, mobility, comfort travelling, safety.

Time of turn-around in economic value and it implications in sustainable city management.

Recommendations.

- Presence of credible, coherent and reliable transportation and traffic, land use economic data
- Provision of critical and impotent road network in the cities
- Development and modern technologic transport infrastructure development in cities
- Professionals and traffic skilled managers for control and management of movement in cities
- Cities space in terms of both use and form. Urban and city planners, scholars, social sciences and transport management technology have to assist in stabilizing land uses
- More efficient and effective but equitable cost recovery measures should be introduced
- Government at all level should encourage private sector participation in city sustainability and development as regards waste management and traffic control
- City planners have to come with a realistic economic city plan of diversification and transportation reforms
- The imbuement of city planners should pursuit principles such as knowledge with character, business with morality, transportation science with humanity and sustainable wealth with work.
- Adequate funding of city sustainability planning programmers and researches for sustainable city development
- Government should do more to address the issue of multimodal transportation in cities to curb crime, loss of value hours and mobility in the country
- Tightening of transportation regulation and supervision
- Introduction of traffic information technology to safe time, reduce accident and easy mobility
- Less dependence on foreign data on Nigeria for transport planning movement.

City Sustainability and Control of Land Uses

Generally, public transport and non-motorized modes require high densities and mixed uses in order to be practically and financially feasible. Compact city development is also often associated with shorter distance and lower use of motorized transport; land-use controls have important implications for travel behavior. There are many complexities in the relationship between transport and land use. A wide range of variation in terms of urban form, density, governance, economy, zoning controls and enforcement capacity, exist in the developing world. Sustainability choice depend on local characteristics, which are briefly reviewed here. Some developing cities have strong economic which enable transport investments and land use control, others are approach to development and are dominated by the informal sector. In most developing city contexts, land use intensification often occurs in the absence of land use controls. Strict enforcement to avoid sprawl and high public investment to purchase land or development rights; "for the creation of city green belts, green corridors or ecological reserve area" in terms of functional mix, developing cities are generally characterized by high levels of mixed use as well vitality and vibrancy. This have been limited due to the shift from comprehensive planning to piece meal project-based and strategies planning, which has also occurred in developed cities.

With the great diversity of land use approaches, preferences and constraints in city sustainability it is difficult to come up with a set of recommendations that can apply to all. Experience from this research finding suggests that some degree of success can achieved if a pragmatic rather than idealistic approach is taken. Compacting efforts can be concentrated on the development of new neighborhoods rather than on modifying existing ones. The researcher hereby purposes the approach below: -

Proposed framework for city sustainability.
Diagram 3.

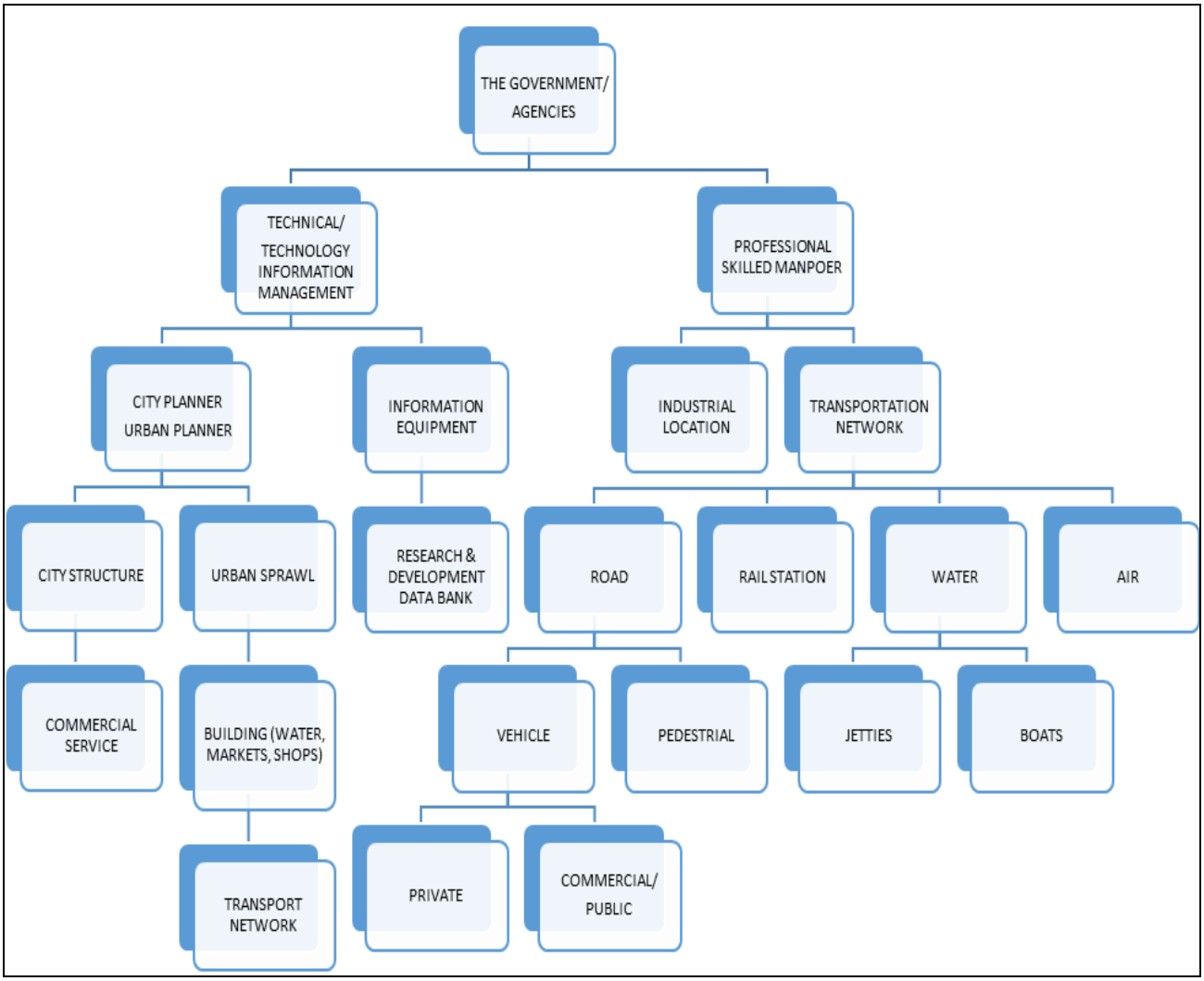

Fig 3

Other areas to be looked into are

- Electricity supply has to be stimulated for cities to function properly, water supply, security and environmental resources management in cities have to be enhanced.
- War, terrorism, religious intolerance, assassination, kidnaping cannot help the process of city sustainability.
- Every aspects of the problem must be examined, to initiate treaties which are sincere, lasting and beneficial in their effects.
- Innovative system should be generated and developed, based on knowledge, information and technology.
- Nigeria cities must be planned for increased communication and be planned for increased communication and security, and city should prepare for security challenges through meaningful surveillance.
- More of the public resources should be committed to infrastructure development and basic needs of city sustainability and development.
- A democratic plan must be draw-up mobilize adequate resources to develop the cities, finance infrastructure, public transportation system, traffic information system, transport models, housing and raise living standards of the people.
- There is need for greater coordination between the regulatory and supervisory agencies.
- Greater emphasis on enforcement of code of transportation and corporate governance.
- Nigeria should be fully prepared enough to neutralize the wind and extract the opportunities of city sustainability economy.
- Investing in infrastructure related to trade and transport, such as ports, road, rail and airport links and connections should remain a priority and sufficient funding should be made available for that purpose.
- Improving physical transport infrastructure and connectivity, soft barriers would need to be converted into facilitators, legal and regulatory inconsistencies need to be addressed and streamlined with maritime

corridors (jetties) in-order to reduce trade costs.
- Security arrangement and mechanisms to ensure the safety and security of goods moving across BRT can help protect investments.
- Information and digital technology and automation would help improve multimodal transport connectivity in cities e.g. information sharing networks, collaborative platforms and opportunities to improve efficiency and transportation system.

The economic effects of improved transport network and city sustainability

Measured impact that improved multimodal transport connectivity might have on multilateral trade and economic growth in a city sustainability are

a. That multimodal transport infrastructure and connectivity can facilitate trade expansion.
b. It can attract foreign direct investment.
c. It can speed up the industrialization process.
d. It facilitates regional integration and accelerate the process of economic growth, which is the factors that make-up a city.
e. The need for rail system connection between trading partners has the largest impact on improved mobility (BRT) for sustainability.

Conclusion

Despite the fact that technology revolution has energized the city sustainability in the past eight years, government must continue to monitor the transport industry, the city development and the management skilled technology applied while operators must not slow down in the investment required to meet the expanding of the city sustainability and technology (ICT) industry.

The ear of responsibility is now down on us. Let us all rise up to these challenges for a better world of city sustainability, urban agriculture transportation prompt payment of taxes by tax dodgers, and new transport vehicle development for future usage and comfort, safety and security reliable mobility. For city sustainability, the researcher suggest that Lagos mega city requires practical policies and strategic development plans that could control the rapid growth new tools are needed to monitor the city landscape characteristics and transportation, distribution, industrial traffic system to stimulate the desired sustainable future of the city and a facilitator for providing public services. The city growth management was suffering from the lack of policy implementations due to the institutional weakness.

Based on the above suggestion and conclusions this research work can be used as recommendations for Lagos mega city and any developing city for its sustainability by considering all aspect of the development that involve social, environmental, economic political and transportation network. More strategic tools need to be developed in order to control the urban city growth dynamics and minimize the undesirable impacts of the rapid transportation traffic effective.

There is crucial necessity to establish effective institutions supported by strict regulations and laws regarding the city growth management, in order to ensure fully considered distribution of city population provide adequate and affordable transportation, provide better quality of city and enhance sustainable development linkage between city and transportation system.

In addition, the city sustainability management plan has to be reviewed by professional groups, transport management technologist, in order to update the policies and strategies planning control need of governments which is needed for city sustainability. There could be substantial further benefits if cities coordinate their development plans to achieve sustainability between their policies and infrastructure implementation should work together to ensure that initiative delivers sustained the economic, social and environmental benefits across the cities.

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