



## Sustainability in the Nigerian Transport System: A Review

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### ABSTRACT

*The rapid expansion of municipal urban areas has led to several issues involving road traffic congestion, infrastructural degradation, unfavourable climate changes and waste disposal issues. Therefore, the need to incorporate sustainability in a country's transportation sector must be persistently emphasised. Transportation serves as a means for conveying goods and services to end-users; thus, it influences the economic sector of any nation. Given such sensitivities associated with the road transport system, its failure cannot be tolerated as it could hamper other sectors of the economy. This paper discusses sustainable transportation development in Nigeria by using reliable and effective traffic management strategies. Pertinent information regarding sustainability, traffic management and city development was obtained from Scopus, Google Scholar and Academia databases to underpin the literature for this research. Notwithstanding, this study suggested that environmental concerns should always be factored in when developing newer road infrastructures – as this could go a long way to guarantee sustainability in the Nigerian transport system.*

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### INTRODUCTION

Sustainable transportation exists as one of the key driving forces of development in a civilised society. Transportation is about the mobility of people, goods and services. World demand for transport services is growing at an alarming rate. For example, global demand for passenger transport service is predicted to grow from 26 trillion passenger kilometres in 1990 to 103 trillion passenger kilometres in 2050 on average (Schafer and Victor, 1997; USA DOT, 1999). Unfortunately, the rapid growth in transport demand strains the transport capacity unit because of inadequate expansion in transport, physical infrastructure.

Consequently, this situation poses a capacity crisis, which generates an increase in congestion, pollution and

safety problems in the system. The demand for transport is increasing rapidly due to the growing demand for transportation by the other economic sectors: industry, energy, health, household, commercial etc. In 2016, the transport sector accounted for more than 24% of global CO<sub>2</sub> emissions (Wang and Ge, 2019). This trend is expected to grow at a faster rate, especially in emerging energy markets. Nigeria is a characteristic example of emerging global energy markets. The country's energy consumption structure is equally increasing with its socio-economic development. In 2017, its total energy consumption was estimated at 451.3 TWh, representing 0.26% of world energy consumption (NPEC, 2020). In 2018, the Nigeria transport sector (NTPS) GDP stood at 277 338.67 NGN

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million in the fourth quarter. The long-term was estimated to trend at about 244 302.00 NGN million in 2020 from econometric models

Conversely, the CO<sub>2</sub> emissions from the sector in 2014 were about 35.4% of the overall fuel consumption, with an increasing trend in recent times (NGDPT, 2020). Studies have shown that about 6.6 million vehicles in 2010 were listed plying the Nigerian highways. In 2015 and 2016, the vehicles were estimated to have increased to 9.8 and 10.6 million, respectively (VPN, 2020). The NTPS comprises marine, railway, road and airway. The major energy carriers in these subsectors include oil, diesel, kerosene, and petrol. The road sector consumed about 90% of Premium Motor Spirit (PMS), also known as petrol, and 40% of Automotive Gas Oil (AGO), also known as diesel, produced in the country. The aviation and water transport subsector consumed about 24% and 6% of the total Dual-Purpose Kerosene (DPK), also known as kerosene, and total AGO used in the sector, respectively (Oniwon, 2011). Statistics indicate that in 2019, Nigeria imported 20.8 billion litres of PMS, representing 57.2 million litres per day, while 5.15 billion litres of AGO were imported.

Similarly, the household kerosene, aviation turbine kerosene, low pour oil, and liquified petroleum gas imported stood at 128.11million litres, 1.07 billion litres, 45.98 and 526.06 million litres, respectively (NOC, 2021). Out of the 20.8 billion litres of imported PMS, over 80% is used by the land transport sector, excluding local production. Additionally, the increasing activities within the NTPS, mainly from the land transport subsector, propose that the NTPS is significant in GHG emission inventories and a significant sector to be anticipated for mitigation potential.

In recent times, sustainability and mobility have constituted an integral part of transport strategies and policies since social interaction is a key human need that depends on the movement of people and goods (Rode, 2019). Due to the interdependence of transport influence and sustainability and the difficulties in managing sustainable transport, the literature requires detailed studies on the relevance of sustainability in transport infrastructure (Yigitcanlar, et al., 2014; Systems et al., 2016; and Zhou, 2012). Integrating sustainability in the transport industry connotes every means of 'green' transportation' and has minimal effect on the environment. Sustainable transportation is also about balancing the current and future needs (Cidell, 2012). Sustainability emphasises addressing today's needs without impacting future generations' capacity to address their needs. It is in transport terms, as May (1997) puts it; "a strategy which achieves improvements in inefficiency and accessibility without degrading the environment or increasing the accident toll is clearly more sustainable." Going by this definition, sustainable transport strategies include: Economic efficiency in using transport resources; Accessibility within and outside the city, which is defined as a case of reaching transport facilities and an enhanced environment including land use and safety.

As cities expand at a spontaneous rate, some changes are often implemented on a variety of fronts encompassing socio-economic, demographic, environmental and political forces. The city is usually more than just a dwelling place; it is characterised by activities with spaces dedicated to daily leisure, commuting, expression and physical engagement. Consequently, special expectations

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which are adaptable and provide a range of experiences are imposed on municipal areas (Andersen, 2011). According to Oyesiku (2002), land rights influence the distribution and morphology of buildings in an atmosphere that promotes accessibility, harmonious land use and convenience. Thus, in areas of significant urban growth, such as Nigeria, it is necessary to implement efficient management and urban land control practices for sustainability. Ajiboye (2005) reported that many towns rapidly grow in Nigeria without following the laid down land use ethics. This compromise in the land use ethics has caused several issues such as transportation issues, the outbreak of diseases and other unhygienic conditions.

There is an increase in the number of times gridlock occurs in Nigerian metropolitan areas, especially during weekday rush hours of 7 am to 9 am and 3pm to 5 pm (Ayo-Odifiri et al., 2017). As a result, employees are greatly affected due to the substantial time spent by them attempting to commute to work or return home across distances of less than three kilometres. Sadly, traffic congestion has developed into a modus operandi in most urban regions in Nigeria; more so, employees take advantage of the traffic situations as an excuse for arriving late to work. Solanke (2013) reported that the availability of robust transportation infrastructure to meet the ever-growing population of developing cities in Nigeria has been insubstantial. Even worse is that several attempts to bridge this gap have resulted in some sort of mobility crisis and traffic congestion over time.

Notwithstanding, there is a growing need to instigate proactive measures to ease traffic across the city, especially at this time of mounting traffic congestion in Nigeria's metropolitan cities and diminishing

government resources assigned to better the transportation infrastructure. In addition, transit facilities in most metropolitan cities are being poorly managed and neglected, thus making it difficult to achieve a robust, accessible and affordable mass transit system that serves the public interest. Hence, the need to incorporate sustainability in the transport sector (Dastan and Petra, 2019).

A sustainable transportation system in the transport sector refers to one that is obtainable, secure, environment-friendly, and affordable (Silva, 2018). According to Litman and Burwell (2006), sustainability in transport is mainly measured by the economic, environmental, and climate efficiency and effectiveness of the transport system. Transport infrastructure, in particular, is a dynamic network linking cities and people movements with socially, economically, and environmentally sound urbanisation and population growth. Additionally, transport infrastructure networks contributed to socio-economic development and improved living standards throughout the generations during the urban advance of between- or within-city connections (Rissel, 2013; Griškevičiūtė et al., 2016). However, this paper seeks to review the concept of sustainable development and its application in the transportation sector. It discusses the different aspects that are important for achieving a sustainable transport system and relates them to the existing definitions and views on sustainable transportation.

## **SUSTAINABLE TRANSPORTATION**

### **Transportation and sustainable city development**

Quite a number of papers have been presented in literature about sustainable development in the field of

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ecology-economy interactions. These ecology-economic interactions usually share similarities with environment transportation interactions because the transportation sector is mostly regarded as an ingredient needed for economic development in every country (Solomon et al., 2021). Transportation is mostly regarded as "a means to an end" resulting from social and economic developments.

Sustainable development has been described in many research papers as a practice of meeting present demands without endangering upcoming generations' capacity to fulfil theirs (Emas, 2015; WCED, 1987; Solomon et al., 2021). The need for sustainability is incessantly growing to ensure a decent future for the cities across the globe culturally, politically, economically, ecologically and socially. To create an environmentally sustainable prospect of transportation in urban areas, engineers consistently work on certain factors such as demographic expansion and the development of non-renewable energy usage (Elkin et al., 1991; Rodrigue, 2005).

According to Doi (2015), transportation is a necessary activity and process that connects people, services and commodities across diverse use of land infrastructure and other sectors of the economy. Transportation is also perceived to be critical to society's commercial, cultural, and socio-political growth. Consequently, a city is considered satisfactory if the public transportation system is proficient in meeting the demand of people, services and products in a safe, pleasant, comfortable and efficient manner. The key to developing a city's pattern of activities is to logically order the activities concerning transportation routes while trying to create maximum variety in each location (Ayo-Odifiri et al., 2017).

A city is essentially a location of exchange; meanwhile, its ability to affect trade depends on the closeness of complementing components and the seclusion of mutually destructive components. Just as it is with the human circulatory system, a failure of a city's transit system automatically affects all other sectors negatively.

Over the years, there has been contention about whether existing roads, which require the removal of existing structures, are an environmentally sustainable method for traffic management and road safety (Takyi et al., 2013; Pojani and Stead, 2015; Zanule, 2015). An ideal scenario is envisaged in Akure metropolis where disregard for feeder roads and socio-economic features of trip makers were identified as the main reasons behind the traffic nuisance observed in the area (Okoko, 2006; Olorunfemi et al., 2014). However, Ogundare and Ogunbodede (2014) further highlighted other reasons, such as on-street parking and trade and difficulty with motor park location. Nevertheless, it was established that only implementing "innovative transportation planning processes" will terminate the city's traffic congestion (Poopola et al., 2013; Okoko, 2002). In a similar study, it was asserted that Nigerians' demand for highway travel is continuously growing, especially in urban areas (Asiyanbola and Akinpelu, 2012; Atomode, 2012). As a result, adequate transportation facilities and cost-effective traffic management schemes are advocated for to mitigate the urban transportation peril. Several strategies for managing traffic, such as traffic system management (TSM), traffic demand management (TDM), polluter pay principle, park and ride, car-sharing and modal limitation have been neglected in many Nigerian urban areas. The development of urban

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centres across the urbanisation process is greatly influenced by the accessibility of the city services. Therefore, introducing a new transportation connection to a regional network affects the city's relative accessibility that are linked (Haggett, 1979). When the connection improves, route alternatives expand and travel distances decrease thus, paving the way for a more direct transit between the destination points and the origin, which results in a more effective, accessible and robust system (Ayo-Odifiri et al., 2017).

The analysis of transportation systems must consider many elements, including human behaviour, geography of the system, network configuration, external influences on the system (politics and economics, for example), and the travel modes that are available (Schiller, Bruun, & Kenworthy, 2010). Sustainability is also complex, in as much as, it is a topic that explores all elements of human welfare (the social aspects of sustainability), economic expansion, and effects of population growth and development on the environment. Given the complexity of both topics, relating the two into a collective field creates a thought-provoking topic to address (Cidell 2012). This study seeks to clarify current views on the connection of these two complex fields: transportation and sustainability.

A foundational concept in applying sustainability to transport is the triple bottom line. Theis (2012) and Black (2010) view sustainable development concerns using three dimensions –economy, environment and society. These three dimensions are commonly referred to as a 'triple bottom line:

i. Economy: the process of a community's growth and progress towards economic goals, such as increased wealth, productivity or

ultimately welfare is considered the economic development.

- ii. Environment: the ecological dimension reviews the impacts of human activities and developments on changing environments
- iii. Social: the social component of sustainability is often described as dealing with matters of equity and inclusion.

It wasn't till the late 1980s that sustainability became a topic of common discourse, before which, the need to address a different impacts of transportation systems was a key component of transportation planning. For example, Masarova, & Iyanova, (2013) wrote on viewing transportation systems as holistic entities, with an emphasis on multimodal solutions that accounts for social, economic, environmental, political, and other considerations. This approach was written before sustainability became a mainstream research topic. Nevertheless, it is in line with the core principles of sustainability and the goals set out in the Brundtland Report, and others who have since studied and elaborated on the sustainability concept. Schiller et al. (2010) believe that the application and characterisation of sustainability goes beyond technical progression. Developing sustainable transportation encompasses society at large – planning, policy, economics, and citizen participation (Schiller et al., 2010). As transportation has different negative impacts, specific emphasis on environmental, economic, and social issues must be encompassed in a definition of sustainable transportation and its application (Bongardt et al, 2011). Despite the increase in sustainable transport studies, there is no universally accepted single definition of sustainable transportation or how to measure it (Bongardt et al, 2011).

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This study classifies different definitions of sustainability as aspirational or objective-oriented. Aspirational definitions provide general guidance for sustainability and transport, this includes that written by Black (2010). Black states that a sustainable transportation system is one that follows the Brundtland definition or simply said "transportation that satisfies the current transportation and mobility needs without compromising the ability of future generations to meet those needs" (Black, 2010). This definition locks sustainable transport in line with broader research on sustainability. An objective-oriented definition deals with outlining specific measurements or considerations for a transport system to be sustainable. It is more commonly referred to as the "Centre for Sustainable Transportation definition". It is different from other definitions because it outlines three key elements of sustainable transportation:

- (1) Allows the basic access needs of individuals and societies to be met safely and in ways that are consistent with human and ecosystem health, and with equity within and between generations;
- (2) Is affordable, operates efficiently, offers versatility in transportation mode, and supports a vibrant economy;
- (3) Considers pollution by limiting emissions and waste within the planet's ability to absorb them, minimises consumption of non-renewable resources, limits consumption of renewable resources to the sustainable yield level, reuses and recycles its components, and minimises noise pollution (Ramani, et al., 2011).

Thomas et al., (2014) have similar ideals on transportation and identify that these may be difficult to balance: (1) Economic efficiency -

reflected in an improvement in connectivity by increasing competitiveness; (2) Social equity - reflected in more equal access to high quality transportation facilities (for different socio-economic groups, for less central areas); (3) Environmental sustainability - reflected in more emphasis on coping with the negative by-products of the transportation sector, i.e. pollution, noise, landscape decay, congestion, lack of safety (Thomas et al., 2014).

The demand for transport is increasing rapidly due to the growing demand for transportation by the other economic sectors: industry, energy, health, household, commercial etc. In 2016, the transport sector accounted for more than 24% of global CO<sub>2</sub> emissions (Wang and Ge, 2019). This trend is expected to grow at a faster rate, especially in emerging energy markets. Nigeria is a characteristic example of emerging global energy markets. The country's energy consumption structure is equally increasing in tandem with its socio-economic development. In 2017, its total energy consumption was estimated at 451.3 TWh, representing 0.26% of world energy consumption (NPEC, 2020). In 2018, the Nigeria transport sector (NTPS) GDP stood at 277 338.67 NGN million in the fourth quarter. The long-term was estimated to trend at about 244 302.00 NGN millions in 2020 from econometric models.

Conversely, the CO<sub>2</sub> emissions from the sector in 2014 were about 35.4% of the overall fuel consumption, with an increasing trend in recent times (NGDPT, 2020). Studies have shown that about 6.6 million vehicles in 2010 were listed plying the Nigerian highways. In 2015 and 2016, the vehicles were estimated to have increased to 9.8 and 10.6 million, respectively (VPN, 2020). The NTPS comprises marine,

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railway, road and airway. The major energy carriers in these subsectors include oil, diesel, kerosene, and petrol. The road sector consumed about 90% of Premium Motor Spirit (PMS), also known as petrol, and 40% Automotive Gas Oil (AGO), also known as diesel, produced in the country. The aviation and water transport subsector consumed about 24% and 6% of the total Dual-Purpose Kerosene (DPK), also known as kerosene, and total AGO used in the sector, respectively (Oniwon, 2011). Statistics indicate that in 2019, Nigeria imported 20.8 billion litres of PMS, representing 57.2 million litres per day, while 5.15 billion litres of AGO was imported. Similarly, the household kerosene, aviation turbine kerosene, low pour oil, and liquified petroleum gas imported stood at 128.11million litres, 1.07 billion litres, 45.98 and 526.06 million litres, respectively (NOC, 2021). Out of the 20.8 billion litres of imported PMS, over 80% is used by the land transport sector, excluding local production. Additionally, the increasing activities within the NTPS, mainly from the land transport subsector, proposes that the NTPS is significant in GHG emission inventories and a significant sector to be anticipated for mitigation potential.

Furthermore, the contribution of the NTPS to the overall energy intensity between 1990 and 2011 was the highest, which stood at about 59% (Abam et al., 2014). This value is projected to increase with time due to the increasing economic activities, with birth boom of vehicles, and population growth, which is currently estimated at approximately 202 million people (Okereke et al., 2021). Though the transport sector plays an important role in national development, it carries the burden of increasing global warming beyond the planet's comfort level. Without concerted efforts and sustained

ambition to reduce the transport sector's carbon emission, the transport sector could derail all the efforts to reduce carbon in the other energy-end use sectors. Therefore, it is necessary to understand the fundamental drivers of carbon emission in the transport sector and forge a pathway to reduce emission from the transport sector. In this regard, many researchers have attempted to decouple emissions from the transport sector through decomposition analysis (Jiang et al., 2018; Engo, 2019).

### **Sustainability in Abuja Transportation**

The Nigeria FCT public transport system, which provides services for nearly 1.4 million passengers (Oniyangi, 2012), faces various problems today, the highly diverse traffic network, mostly dominated by private cars and the public transport operator's low service quality causes intolerable wait period and road traffic jams. The centralisation in the city centre of government services, economic operations and core private sector companies, leaving much of the population in the nearby cities and villages, leads to enormous amounts of movement of vehicles to and from the capital, and every day to the neighbouring settlements. Limited access to public transport is the evolving characteristics of this commuting problem and this needs to be extensively researched because, it would not only help to alleviate the traveling problems, but also provide a credible and impartial source of knowledge for the territorial transport activity plans that will be complex as admitted by the FCT Transport Policy and this could lead to change as there is growth in the city (Oluwole, 2014).

The Federal Capital of Nigeria, Abuja, is an upcoming city that was built and planned at the end of 1970, (Oluwole, 2014). It may be one of the

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few cities in the world designed and planned as a national capital before it was built. A master plan that laid out the architecture to keep up with the demands of an increasing population influenced its development. Although much of the ambitions of its creator have been fully fulfilled, it lacks a rapid transit system for rail. Abuja's architectural design is a straight shape, roughly formed into something like a crescent shape. Nevertheless, the city was originally built for 1.6 million people; the total population of the city and neighbouring settlements is 7 million. The average number of residents is 49, with fewer than 50% of households owning vehicles, (Oniyangi, 2012). The total amount of revenue spent on travel is 30 percent and N42, 000 is the average monthly family income. Actually, N250 costs a medium of journeys and the present travel time is 40 to 90 minutes with a substantial wait period (Samuel & Adetayo, 2018). Inside the Abuja Capital city, many of the residents living in the neighbouring towns work and need to commute to and from place of work. According to Samuel & Adetayo (2018), the architecture of the town was planned primarily to accommodate public transportation by train. Parallel routes passing along approximately 19 towns are the railroads. Although, personal cars and vehicles were not originally designed for such routes.

The goal of the rail mass transportation developments in Abuja is to establish a rail mass transit network that meets the highest global expectations of technological excellence, takes advantage of the efficient operating and managing of the private sector, and is broadly adopted socially and politically. The overall purpose is to ensure that Abuja maintains its status as an outstanding commercial hub and as a city that will drive Nigeria to become

Africa's largest and most competitive economy. An efficient mass rail transport network would provide the city with many advantages. It would have an alternative compared to the dangerous mass transport that is safe and accessible. It will give environmental benefits by minimising emission of gases and also road congestions and traffic. It would bring Abuja on the global stage being one of the few cities to run a high-level rail system in Africa. Light railway networks give the use of divided right of way since the rail network was designed to grow the area (Samuel & Adetayo, 2018).

#### **Sustainability in transportation on the international scene**

According to Pratibha, (2010), sustainability in the United States of America is currently either directly or indirectly included in the task objectives of more than 40 percent of state Departments of Transportation (DOTs). In fact, a rising number of organisations all over the world have started to build and also use indicator frameworks to assess their advancement towards the sustainability of the transport sector (Pratibha, 2010). Increasingly flourishing on the transport (trade) market and improving living conditions, the globalisation of practices tends to put more demand for all methods of travel in both the industrialised and developing economies. Technology innovation has led to changes in safety and also travel speed; it has also made it possible to decrease some of its dangerous effects (Pradhan & Bagchi, 2013). Renewable oil such as petroleum as an energy source that has continued to be finite resource has also been instigated by over-dependence on petroleum product, therefore, there is need to find other alternative energy sources (solar

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power, electric power energy source). Because of the environmental impact of the existing supply, advanced worlds are now searching for an alternate source of electricity. There is a strong connection between the value of the infrastructure (i.e., development) of a nation and its capacity for growth.

Bangkok's traffic condition has been identified in literature to have an average travel speed of 5-6 km/hr on main routes, especially in the metropolitan cities (Sopranozzetti, 2013; Singh et al., 2015). Even worse is that identifying peak travel times in Bangkok's metropolitan cities has become challenging since congestion continues to occur from dawn to dusk. Sopranozzetti (2013) propounded that the main cause of the traffic in the city is rapid growth in the ownership of private automobiles and usage. In addition, other contributing factors include inadequate road network design capacity, ineffective transportation programme and insufficient investment in public transit.

The government's role in buying and running crucial parts of the transport system has also improved in recent times. While the government has traditionally been primarily responsible for supplying, upgrading and sustaining the road system of a state, there has been a growing change towards involving the private sector because it also has some level of effect on the growth of road infrastructure. The role of the private sector is also being strengthened by public-private collaborations in areas such as roadways (Umar, 2013).

### CHALLENGES IN INCORPORATING SUSTAINABILITY IN TRANSPORTATION

Oraegbune, (2015) listed 13 vital sustainability challenging issues below.

1. Polluting the climate
2. Service form and management of project
3. Government or developer accountability to the communities and environment in Nigeria
4. Public engagement and general environmental consultancy in Nigeria
5. Noise and sound from construction buildings
6. Engineering/Technical Productivity and advancement in materials
7. Project of Safety and Health for personnel
8. Neighbouring towns and travel modalities in Nigeria.
9. In Nigeria, managing contract and project requirements
10. The welfare of railway passengers at building sites
11. Soil degradation and the prevention of sedimentation at the project sites.
12. Management, reuse and recycle of industrial waste in Nigeria
13. Nigeria's full-life cost/life cycle expense

Rodrigue et al., (2013) proposed that problems with transport planning has a level of sophistication that needs both theory and functional strategy to be implemented. Sustainability evaluation is defined by Pradhan & Bagchi (2013) as a way of exploring the effect on conservation of current policies, strategies, initiatives, projects, or major legislation, or established practices or activities. Congestion is a key problem in auto-dependent cities that significantly impacts their sustainable development. Congestion is attributed to low flow rates of vehicles and increased traffic density, and is a key problem affiliated with auto dependence. Congestion has been considered a global phenomenon caused by high dependence on automobiles (Redding, & Turner, 2014). Cidell (2012) examines the economic

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effects of traffic congestion, indicating that it is deemed inefficient from an economic standpoint whenever a system struggles to have the required standard of mobility for various transport purposes and multiple modes.

Additional insight on the inefficiency of auto-dependence outside the congestion consequences was given by Schiller et al (2010). Schiller et al (2010) stated that cities were able to increase dramatically with fewer barriers because of the reduced travel time and improved personal mobility offered by cars than when the same cities were dominated by other modes of transportation. The authors propose that auto-dependency has produced environmental effects, particularly increased mobility pollution and increased use of lands for the construction of roadways. Schiller et al (2010) suggest that because of the extreme number of roadways needed to promote travel, the economic effects of auto-dependence are seen in the expense of infrastructural growth, which is greater for automotive based structures than for other modes.

#### **THEORETICAL CONSIDERATIONS**

All Nigerians, including all levels of government, business and industry, civil society, civic groups and residents, have a role to play in advancing sustainable growth. A timely adoption of a sustainable development plan is one of the essential requirements the Nigerian public needs (Oraegbune, 2015). The importance of finding a balance between economic development, social well-being and environmental sustainability lies at the centre of public opinion. Nigerians need to understand that a healthy environment is important to our long-term economic, social and quality of life (Osayomi, 2013). The establishment of a sustainable development strategy

should be a key pillar approach to sustainable development. This approach is an essential tool to help direct the nation in consistently incorporating sustainability concepts into its strategies, services, legislation and operations. Nevertheless, despite the philosophy and principles of sustainable development, it is obviously clear that transport and its related component parts are essential to achieving sustainable development goals set.

In another aspect, transportation needs to be put as a true resource for pursuing the development agenda (Oraegbune, et al., 2015). There are three think tanks exiting on the role that transport plays in sustainable development and overall economic growth.

1. The transport is *sin-qua-non* for there to be economic growth. This school of thought is of the opinion that growth cannot occur without transportation. To suggest that transport is very important for progress to be accomplished.
2. The second school of thinking believes that there is no significant role and commitment to transportation in economic growth and for sustainable development.
3. The third school of thought suggests that transport plays a permissive role in economic growth and sustainable development, suggesting that transport is important to economic growth, but it is obviously not the only prerequisite for economic change and sustainable development to take place. By definition, it indicates that other economic industries, along with transport, do not have a contributing role to play (Oraegbune, et al., 2015).

In Nigeria, it is quite surprising that at each point of the pursuit of economic growth, these three schools of thought have focused on how

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expectations of sustainable economic development have been achieved at one point or the other. For example, transport does not play a very important role at an early stage of growth, due probably to the level of economic development at the very local and primary level (Oluwole, & Ojekunle, 2016). Therefore, for subsistence life it was merely an exercise of the collective life and development system. With population growth and a rise in human demands and needs, however, and the advancement of exchange economy transportation provided a permissive role in facilitating the selling of farm produce as well as spatial interaction for various reasons. Nonetheless, it is quite obvious that a permissive position that duty seems to be quite appropriate for the sector given the attributes of transportation. Since where no goods are to be transported or where spatial contact is undesirable, it would naturally be pointless to move them to these places (Oluwole, & Ojekunle, 2016). Transport is a derivative demand and thus does not simply answer to one's self but to help achieve the social, cultural, political and psychological needs of man that cannot be achieved, realised or installed within walking distance.

## CONCLUSION

It has been established that transportation facilitates employment opportunities and access to commercial, institutional, and residential land uses as well as other infrastructures. As many people continue to own vehicles in Nigeria due to increasing population and industrialisation, traffic congestion is generated in many Nigeria cities. Notwithstanding, in a system of functional transport infrastructure and management, environmental degradation and road congestion are

adequately managed; thereby, facilitating ease of transportation in the urban regions. The problem of traffic congestion is a critical one because it contributes immensely to the economic loss of any country and negatively affects the quality of life of people living in the city. Moreover, the recommended strategy for resolving traffic congestion is to develop robust road infrastructure to accommodate the increasing population of people living in the metropolitan cities. However, certain factors such as space requirements, high cost of construction, and environmental impact considerations may impede the development of a robust road network and infrastructure. Notwithstanding, it is necessary to factor in environmental concerns when developing newer roadways. This would help guarantee a greener, environmentally friendly and sustainable transportation system.

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