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The impact of transportation on the economic development of Nigeria: The journey so far and the way forward

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Abstract

The aim of this paper is to discuss how Nigeria's investment in transportation has contributed to the country's economic development. From the early 20th Century, transportation moved from the waterways to the railways and later to the roads while airways transportation was introduced after World War II. Each change had some impact on the economic development of Nigeria. The historical development of these modes of transportation, their prospects for further development and the challenges they are facing were discussed. The journey so far indicates that there has not been a balanced development of the country's transportation system. Presently, with the marked increase in road construction and the simultaneous operational and organizational difficulties being experienced by the railway and inland waterway systems, the movement of people and all types of goods all over the country is dominated by road transport. In fact, roads are overused and also wrongly used in Nigeria while the waterways have a lot of capacity that is not being utilized. Railways were heavily used in the past but sparingly used now while the airways are heavily used but still need a lot of improvement and expansion. The major results of the predominant use of road transportation over all the other modes are environmental problems of road transportation and high frequency of road traffic accidents on Nigerian roads. Therefore, the paper suggested sustainable ways of handling the challenges which the transportation system is facing in its continued contribution to the country's economic development in the 21st Century.

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1.0 Introduction

Transportation constitutes one of the major features of the economic development of Nigeria. Over the years, scholars have debated on a number of issues related to the exact role of transportation in economic development such as the timing of the investment in transport infrastructure, how it works, the amount of transport investment needed for a specific level of development and many other aspects. The answers to these questions are not very easy to obtain because the demand for transportation is a “derived demand” while transport affects and is affected by many other sectors of the economy.

While the debate on the role of transportation on economic development continues, some scholars emphasize that where a nation is lacking in the factors conducive to growth, no amount of transport investment can produce economic development. Fortunately, Nigeria is not lacking in resources and other factors conducive to growth. A wide range of transport facilities already exist in Nigeria and may range from primitive footpaths and dirt roads with human or animal haulage to modern super highways or expressways, railways and airways.

In this paper, we shall focus our attention on the four modes of transportation which have played, are playing and will continue to play very significant roles in the political, social and economic development of Nigeria. These are the inland waterways and the ports, railways, roads and the airways which collectively handle over 99% of transportation in the country. These modes are discussed with special emphasis on their developmental impact on the Nigerian economy and the prospects of their further development especially the challenges they are facing in contributing to the economic development of Nigeria in the 21st Century.

Taffee, Morrill and Gould (1963) Model discussed the major stages involved in the evolution of transportation in developing countries. This model is based primarily on studies in Nigeria and Ghana and to a lesser extent, on the studies in East Africa, Brazil and Malaya. Rimmer (1977) added the application of the model to Southeast Asian countries. These models advocate six major stages which were later summarized to four major stages of the evolution of transportation in developing countries and Nigeria has experienced all the stages. The first stage, called the early colonial phase, is marked by the development of scattered ports and trading posts along the coastline and navigable inland waterways. The second stage is characterized by the emergence of a few penetration routes from the ports to the interior. The third stage is marked by the development of feeder routes and lateral interconnections which took place sporadically. The fourth and last stage, which is marked by the development of high priority linkages, is an indication of the transportation system’s movement into maturity.

Generally, in developed countries, much attention was paid to the development of transportation during the early years of their industrial growth but these countries are now concerned with the modification or renewal of inherited transport systems. On the other hand, developing countries, like Nigeria, continue to improve their transportation systems in order to enable them to develop faster economically. Table 1 indicates the transport sector received a substantial part (ranging from

8.6% to 23.7%) of the planned public sector expenditure by the Nigerian Government from 1962 to 1998.

Table 1: Percentage Share of Planned Public Sector Expenditure on Transport Sector 1962-1998

Plan	Plan Period	% Share of the Transport Sector
First National Development Plan	1962-1968	21.3
Second National Development Plan	1970-1974	23.7
Third National Development Plan	1975-1980	22.2
Fourth National Development Plan	1981-1985	15.2
First National Rolling Plan	1990-1993	11.6
Second National Rolling Plan	1994-1996	8.6
Third National Rolling Plan	1996-1998	10.1

Sources: Nigeria National Budget and Rolling Plans, (1962-1998)

Therefore, there is no doubt that Nigeria is one of the African countries that have spent a considerable amount of their financial resources building, expanding and modernizing her transportation infrastructure. Table 2 presents the proportional allocation of capital expenditure to the transport sub-sector in Nigeria from 1962 to 2000. It indicates that roads (highways) received the highest allocation of the budget to the transport sector from the Federal Government of Nigeria from 1981 to 2000. In fact, the Government spent more on road transport than on all the other modes of transportation put together.

Table 2: Proportional Allocation of Capital Expenditure to the Transport Sub-Sector 1962-2000

S/ N	Mode of Transport	Plan Period							Average
		1962- 1968	1970- 1974	1975- 1980	1981- 1985	1985- 1989	1990- 1994	1995- 2000	
1	Highway (Road)	54	58.8	72.4	70	72.6	65	70.2	66.14
2	Railway	14	17	10.6	15	3.8	14.2	13	12.54
3	Port (sea)					5.9	7.5	4.6	10.57
4	Waterways	25	13	9	9	3.8	3.3	3	3.37
5	Air (Airports)	7	11	8	6	5.6	2.6	2.3	6.07
6	Others	N/ A	N/A	N/A	N/A	8.4	7.4	6.9	7.57
	Total	100	100	100	100	100	100	100	

Sources: Nigeria National Budget and Rolling Plans, (1962 – 2000)

It is against this background that we discuss the historical development of the four major modes of transportation in Nigeria, namely, ports and waterways, railways, roads and airways in

order to show how they have or have not contributed to the economic development of the country and any problems and challenges they are having in their continued contribution to the development of the country in the 21st Century. We shall also suggest sustainable ways of making them to contribute to the economic development of Nigeria in the future.

2.0 HISTORICAL DEVELOPMENT OF THE FOUR MAJOR MODES OF TRANSPORTATION IN NIGERIA

The early 20th Century saw the shift of traffic from the waterways to the railways and later on to road transportation network. Each change had implications for the pattern of commodity flow, regional trade and economic development of Nigeria. The airways transportation came after the World War II and has also passed through several stages in its contribution to the economic development of Nigeria.

2.1 Historical development of the ports and inland waterways infrastructure in Nigeria

Onokala (1994a) examined the pre-colonial stage of transportation development in Nigeria and noted that before the contact with Europe, there were trade routes of tracks and waterways in various parts of Nigeria acting as important channels of communication by using canoes during pre-historic times. The major inland waterways in Nigeria are the River Niger and River Benue which dissect the country into east, west and north sections. The two rivers meet at Lokoja in Kogi State. Both rivers rise outside the country but approximately 1440 kilometers of the River Niger and 960 kilometers of River Benue flow within Nigeria. In Northern Nigeria, River Sokoto and River Kaduna are some of the major tributaries of the River Niger while Gongola River and Katsina Ala River are some of the major tributaries of the River Benue. In north-eastern Nigeria, Hadeija River and others flow into the Lake Chad. Other major coastal rivers in South-western Nigeria include River Ogun, River Osse and Oshun River, the coastal rivers in South-eastern Nigeria include Cross River, Imo River, Aboine (Ebonyi) River and other tributaries of the River Niger such as Anambra and Mamu Rivers. The navigable sections of these rivers and some of their tributaries provided the only means of contact for commercial and other activities between the outside world and large parts of Nigeria and among the settlements along the rivers. The role of the inland waterways and the seaports in the economic development of Nigeria was such that the numerous ports along the coasts and rivers of the country expanded, declined or completely disappeared as the pattern of trade within the country and with the outside world changed. The early part of the 19th Century marked the beginning of the early colonial phase of the development of transportation in Nigeria and was marked by the development of scattered ports and trade posts for commercial activities along the coastline. Some of the ports and trading posts were Lagos, Gwato, Forcados, Koko, Burutu, Akasa, Brass and Calabar, among others, each with a very limited hinterland. However, as the penetration and subsequent control of the interior continued, new trade routes were established and consequently, some ports such as Gwato, Brass, Koko, Forcados and others declined in importance or became extinct while other ports such as Lagos, Warri and Port-Harcourt became dominant.

The early foreign traders who came to Nigeria relied on water transport using the numerous creeks and rivers from where they communicated with specialist traders from the inland trading communities such as Arochukwu, Awka and Nkwere traders in the interior of south-eastern Nigeria until the later half of the 19th Century. In addition, some coastal and riverine communities such as the Efik, Opobo, Bonny and Calabar people traded directly with the European ships. Atubi & Onokala (2007) had also noted that in Delta State, the waterways were used during the early history of trade between the Portuguese and the Ijaw, Itsekiri, Ukwuani, Bini and the Urhobo. They traded in palm oil and other agricultural commodities and later on human slaves. While the palm oil and

agricultural products were supplied by head-loading to the depots and then transported in dug-out canoes to the ports for export, the slaves were walked down the coast. Later the British merchants, who pushed the Portuguese, Dutch and other merchants away, as they penetrated and gained control of the interior, changed from trade in slaves to trade in vegetable oil and other export commodities. They also intensified their operations inland through the river crafts and barges operating on the inland waterways using Niger Delta parts of Warri and Buntu as well as other river ports like Sapele, Onitsha, Ajaokuta, Idah and Baro. Onokala (2002) noted that the period after World War I and II witnessed remarkable development in water transportation in Nigeria, mainly through such improvements such as introducing powered motor boats, government launches, motorized ferries in addition to engine boats and canoes for carrying goods and passengers along the River Niger and other major rivers and for transportation from one side of the river bank to another. Although the outboard engine boat (the Erico) was used on the River Niger between Onitsha and Asaba, River Niger remained a natural obstacle to road transportation until the first Niger Bridge, linking Asaba to Onitsha was constructed in 1965/66 and opened as a toll bridge but later the collection of tolls was abolished. Other major bridges across major rivers in Nigeria include, the Ajaokuta Bridge near the confluence of the River Niger and River Benue at Lokoja as well as the Makurdi Bridge across the River Benue. Currently, the second bridge on the River Niger is under construction.

The development of modern seaports in Nigeria was linked to the establishment of the Nigerian Ports Authority (N.P.A) in 1954/55 and since then Nigerian ports have played a dominant role in the country's international trade. At independence in 1960, Nigeria had major seaports at Lagos and Port-Harcourt which together with minor ones at Warri and Calabar served the maritime needs of the country. By the second half of the 1970's, Nigeria port facilities were severely overtaxed due to the oil boom and the associated improved standard of living which led to a sharp increase in import traffic. The increase imposed major strains on the port system leading to delays in ship handling which resulted in high demurrage. Lagos, the major seaport, suffered serious congestion problems from 1974 to 1977. In response to this, a massive investment programme was undertaken which resulted in the Tin Can Island ports complex as well as the Roll-on Roll- Off (RORO) ports in Lagos being constructed. In fact, there was a massive expansion of port capacity by about 300 percent between 1975 and 1980.

Today, the major seaports are Lagos port, Tin Can Island ports complex, Delta ports complex of Warri, Sapele, Koko and Burutu, Port-Harcourt port and Calabar port. Important river ports on the Rivers Niger, Benue and other rivers include Sapele, Aboh, Onitsha, Asaba, Idah, Baro, Ajaokuta and Makurdi. Presently, the Nigerian Ports Authority (NPA) has 13 major ports and 8 port management Authorities, 11 oil terminals and 128 private jetties within the port system. In terms of traffic, all the ports are import dependent. Overall cargo through put increased from 20 million tonnes in 1998 to 30 billion tonnes in 2000 and at present, Nigeria has total cargo handling capacity of over 35 million tonnes. Generally, most of the ports lack adequate port facilities and are deficient in specialized berths but have excess capacity in conventional berths. In addition to serious port congestion the Nigeria ports suffer other challenging conditions such as use of old and dilapidated haulage facilities in handling cargoes as well as fixed tariffs and quotas by the government. Udo and Ogundana (1966) and Ogundana (1966, 1967, 1970, 1971 and 1973b) discussed extensively issues concerning ports evolution and competition in Nigeria as well as their implications and problems. The reaction of port users to these challenging conditions was the use of alternative ports along the coast of West Africa such as the Port of Cotonou in the Republic of Benin, Lomé Port in Republic of Togo, Accra Port in Ghana and Doula Port in Cameroon and others. Presently, much of the traffic that would have used Nigerian ports are diverted to other ports along the coast of West Africa in spite of the Port Reform in 2003 aimed at revitalizing the

Nigerian ports since the ports infrastructure which are long overdue for expansion and modernization.

Over the years, the volume of traffic handled by the inland waterways in Nigeria had fluctuated due to several reasons such as the Sahelian drought (1972-1974), construction of the Kainji Dam which reduced the water level and in some years the low output from the agricultural economy of the areas along the banks. Although such problems are not permanent, the waterways and the ports in the country have never been properly developed for transportation. Therefore, the huge potential of waterways mode of transportation, which is cheap for moving heavy and bulky goods and also has a lot of capacity for doing this, is presently underutilized in Nigeria.

2.2 Historical development of railway transportation infrastructure in Nigeria

The efficiency of the railway in the mass movement of people and goods over long distances by land is the major advantage of this mode of transport. Rail transport is cheap, energy saving and environmentally friendly. When properly integrated with other means of transport, the railway provides a significant stimulus for socio-economic growth and development. For these reasons, railway is recommended for countries with large expense of land, people and resources such as Nigeria. Therefore, it is not surprising that the reliance on the rivers and creeks as the major means of transportation in Nigeria shifted to the railways as soon as rail transport became available. Onokala (2002) noted that during the colonial phase of transport development in Nigeria, the penetration stage was associated with the construction of the railway network from the ports of Lagos and Port-Harcourt inland into the interior of Nigeria. The railway cut into the interior of Nigeria and for the first time, provided direct access by a modern means of transportation from the coast to other parts of the country. The railway network was constructed in Nigeria by the colonial administration in order to enable it to evacuate minerals and agricultural raw materials and forest resources from the interior parts of the country and also to enable the selling of imported manufactured goods in these interior locations. It was used for linking up the different regions of the country and thus for promoting inter-regional trade as well as increasing industrial and economic development. Apart from the minor branch line constructed in 1964, most of the railway network of Nigeria was constructed between 1896 and 1964. Nwafor (1982) presented the major landmarks and dates associated with the construction of the various sections of the Nigerian railway network. The network consists of 3,505 route kilometers of single line 1.067 meters gauge. The maximum permissible speed is only 64 kilometers an hour with a maximum axle load of 13.5 tonnes. In 1966, the Nigerian railways were dieselized and more efficient and economical diesel engines took over from the coal-powered engines. After the initial construction of the railway network in Nigeria, there has not been any major modification or extensions of this backbone. The network connects the major seaports of Lagos and Port-Harcourt with the major urban centers in the country.

In spite of the deficiencies of the Nigerian railway system, it contributed a lot to the general economic development of Nigeria during the colonial and early independence period by making possible the development of all parts of the country for agricultural exports, specifically cocoa in the west, groundnuts and cotton in the north and palm produce in the southeast. It facilitated the evacuation of minerals for export from the interior parts of the country (such as coal from Enugu and tin from Jos). It encouraged the development of long-distance inter-regional trade in various products within the Unfortunately, there has been a continued decline in the performance of the railway system in Nigeria, and since 1960 the deficit in its operating account has been increasing. The share of export commodities in the railway goods traffic has dropped from a peak of 53 percent in 1968/1969 to 13 percent in 1973/1974 and less than 2 percent in 1982. From the middle of the 1970's, (when the country was experiencing the "oil boom") there was growing

decline in the performance of the Nigerian railway system until it almost grinded to a halt for many obvious reasons. This decline can be attributed partly to increased competition from road transport (for goods and passengers) which is faster and more flexible, and partly to the deterioration of the railways' transport services. It can also be partly attributed to a general decline in those traditional export commodities which used to form a significant portion of the freight handled by the rail, in particular groundnuts. In addition to these challenges is the deterioration of the railway transport services in Nigeria which has become slow, unreliable and grossly inadequate.

In the last four decades, the highest number of passengers carried was 15.5 million in 1984 and the highest volume of freight 2.4 million tonnes in 1977. By 2001 the volume of traffic had declined to less than 300,000 metric tonnes. Presently, the railway is responsible for less than one percent of the total land transport of Nigeria. The alignment of the Nigerian railway system reveals the weakness of not having east-west railway connections but predominantly two north-south lines from the north to Lagos and Port Harcourt ports. The situation is worsened by poor management and institutional bottlenecks in the present pattern of organisation of the country's railway system. Government owns, operates, manages, funds and controls the railway system in Nigeria. This does not promote efficiency and productivity in the modern globalised economy. In fact, due to many years of neglect, the Nigerian railway system has ceased to be economically viable. It has deteriorated in all aspects, and caught up vicious circle of declining traffic, endemic deficits, decreasing capacity to serve its customers resulting in further loss of revenue over the past three or four decades. In addition, the existing railway network is no longer connected to the major population, resources and activity centers of the country. Yet, railways are highly recommended for countries with large expanse of land, people and resources like Nigeria.

Onokala (2002) pointed out that the alignment of the national railway system has a major weakness of not having east-west railway connections. The prospects of a railway line to connect Port-Harcourt to Onitsha and from there to the west of the River Niger has been mentioned but not yet been pursued vigorously. There were also plans for the expansion of the network by adding some east-west lines that will link the two existing north-south lines. The proposed lines are the Ajaokuta- Oturkpo and Warri-Ajaokuta- Itakpe lines (275 kilometers) for the proposed iron and steel complex which have not been actualized.

Presently, most of the railway infrastructure is old, obsolete, outdated and no longer adequate, poorly maintained and no longer functional. Therefore, there is need to modernize the entire Nigerian railway system because the railway is very important for transport coordination in Nigeria.

2.3 Historical development of road transportation infrastructure in Nigeria

The history of road transport in Nigeria dates back to the first decade of the 20th Century when existing bush paths were widened into routes for motor vehicles. These routes were intended to reduce the strain of providing porters for the colonial officials and to link the nearest centers with major railway stations for the evacuation of local export products. It started in 1903 in the north with the construction of the cart and mule road from Zaria to Zungeru and in 1906 in the south with the construction of the road from Ibadan to Oyo. By 1914, there was a total of 3,200 kilometers of roads in Nigeria. Roads were not widely developed, however, until the advent of motor vehicles in the 1920's and 1930's. In fact, it was after World War II that the country came to be served by the extensive network of roads. These roads marked the third phase of the Model of Transport Development which is characterized by the development of feeder routes and lateral interconnections which took place sporadically. Onokala (1994) discussed the development of road

transportation in Igbo Ukwu region. Onokala (2003) also discussed the interrelationship between the development of trade and transportation in Igboland.

In 1926, the road system of Nigeria was classified into three major types as Federal Trunk A Roads, Regional/State Trunk B Roads and Provincial/Local Government Trunk C Roads. In this way, the Federal, Regional/State and Provincial/Local Governments were given separate responsibilities for the planning, construction and maintenance of roads in the country. Unfortunately, this system of allocation, which is not equitable, is still applicable today. Using this system of allocation, the Local Government which are least able to construct and maintain roads in terms of funds and personnel have the largest responsibility while the federal government which is more affluent had the least responsibility. The lopsided system of allocation is also responsible for deplorable condition of the roads in the rural areas of the country.

Although roads were primarily built to feed the railways and be complementary to them, roads eventually took over from the railways as the country's road network improved and captured more and more traffic from the railways, especially after independence in 1960. The new roads resulted in tremendous savings in travel time. Since the 1960's, the total lengths of roads in the country as well as the proportion that has asphalt surface has increased steadily. Presently, Nigeria has a total of 193,200km of roads made up of 34,123km of Federal trunk A Roads, 30, 500km of State Trunk B Roads and 129,577km of Local Government Trunk C Roads. There has also been a tremendous increase in the total number of new vehicle registrations since then except for slight declines during the civil war (1967-70) and during periods of downturn in the country's economy. Practically speaking, many parts of the country are now linked by some form of road, especially during the dry season while recent developments include reconstructing and re-surfacing of the quality of the roads to the level required by the current heavy traffic.

Since 1980, the Federal Government of Nigeria has expanded the Trunk A road network in the country substantially. A major feature of the current stage of transport development in Nigeria is the development of high priority linkages, which is associated with a system of 4-lane expressways that were constructed in the country since 1980. These include the expressways between Lagos and Ibadan, between Shagamu and Benin City, between Benin City and Onitsha, Onitsha and Enugu as well as between Enugu and Port-Harcourt via Aba and Umuahia in southern Nigeria. In northern Nigeria, another system of 4-lane expressway has also been constructed between Abuja and Kaduna, between Kaduna and Zaria as well as between Zaria and Kano, and currently the construction of an expressway between Abuja and Lokoja has just been completed. The expressways reduced travel time and provided increased capacity for more vehicles to travel between the major cities, which they link together and therefore more intense interaction resulting in more economic development. For example, since the construction of the expressways more intense interaction is experienced between Lagos and Benin, Port-Harcourt and Enugu via Aba and Umuahia as well as between Abuja, Kaduna, Zaria and Kano.

Road transport infrastructure in Nigeria accommodates all modes of transport, namely buses cars, trailers and other goods vehicles, walking, bicycles and even animals and pedestrians yet these roads do not have pedestrian walkways. This is not only unsafe especially when they are also forced to accommodate motorcycles now used for commercial transportation, pedestrians and animals. In addition to all these, lack of proper maintenance of the roads, contribute to high rate of road traffic accidents on Nigerian roads. The types of vehicles that use the roads are also varied. In the 1950's, dual-purpose mammy wagons used for carrying both goods and passengers were predominant but these were gradually overtaken by 10 to 15 tonnes trucks/lorries and 30 tonnes trailers that carry containers for the transportation of goods while heavy tankers are used for the transportation of fuel and other petroleum products by road.

In the case of roads misuse, many of the roads feature high axle loads in excess of the approved 9 tonne vehicle weight for which the roads are designed. Most times, trucks and trailers as heavy as 15 tonnes use these roads. Excessive high axle loads on paved and gravel roads substantially reduce the life span of the roads especially during the rainy season. In terms of maintainance, the roads suffer from inadequate routine, periodic and emergency maintainance services. Therefore, in many parts of the country, many roads are in very deplorable conditions. In 1985, about 23 percent of the national roads were in a deplorable state. This rose to 30 percent in 1991, 50 percent in 2001 and estimated 80 percent in 2010. Except roads and bridges and are kept in good conditions they cannot support the desired socio-economic development of the country. Failure to maintain the roads impose high costs on road users and raise the cost of rehabilitation works. The Federal Road Maintenance Agency (FERMA) was established in 2002 by the Federal Ministry of Works and Housing to handle this problem but some lapses still remain. Unless roads and bridges are kept in good condition, they cannot support the desired economic development of the country.

There is no doubt that the Federal, State and Local Governments have been giving high priority to more road construction in their development plans and annual capital budgets in order to achieve more economic development and promote national unity, inter-regional trade and tourism. The contributions of road transportation to economic development of Nigeria are not only significant but also essential, since they opened up new lands for agricultural, industrial and residential development. Roads opened up the interior rural parts of the country to modern means of transportation. This led to greater integration of the regions and to change in orientation of the interior areas from the waterways and the railways to the road system. As the road network expanded, bigger, faster and more comfortable vehicles became available for interregional long-distance trade. Interregional trade promoted internal unity, fulfilled complimentary nutritional needs of Nigerians and also raised the economic standards of the traders. Road transport development also encouraged the migration of population from the hinterlands to the new transport routes thus giving rise to a ribbon-like concentration of towns and villages along both sides of the new roads.

Roads have provided employment for drivers, mechanics, automobile spare parts dealers, petrol businesses, car washers, and other related activities like tourism. These employment opportunities have increased in recent times. The employment- generating and other multiplier effects resulting from these forms of linkages have gone a long way towards the modernization and rapid development of the Nigerian economy. The demand for road transportation in both the rural and urban areas of Nigeria has always exceeded supply. This is because road transport is regarded as a catalyst for regional/ national, urban and rural development.

Unfortunately, most rural areas in Nigeria are not adequately served by roads and even the existing ones are of poor quality and poorly maintaind. They are not tarred, are narrow, winding and seasonal as most of them are not useable during the rainy season, which correspond with the peak of agricultural activities in the rural areas. The federal Government attempted to improve the quantity and quality of roads in the rural areas by establishing the Directorate for Food, Roads and Rural Infrastructure (DFRRI) in 1988. Unfortunately, this was not successful due to unfavorable human and political factors. Other subsequent interventions to develop roads in the rural areas of Nigeria, such as, the Better Life Programme, Petroleum Trust Fund (PTF), NEEDS, SEEDS, LEEDS, Federal and State Ministries of Agriculture and Rural Development and other rural based organizations were introduced but poverty of the rural areas continued. Yet these anomalies and difficulties need to be addressed in order to open up the rural areas of the country and make them contribute to the social and economic development of the country.

Nigerian cities are the nerve centers of socio-economic and political activities and Nigeria is urbanizing at a very fast rate. Therefore, an inefficient transportation system can paralyse urban activities and cause serious economic development harm to the nation. In 1963, the total urban population in Nigeria was 11 million. This number rose to 32.2 million in 1991 and by 2000 the urban population was estimated at 45 million on the average Nigerian cities have been growing at the rate of 8 percent per annum, far in excess of the of the country's population's growth of 3.25 percent. Presently, Nigeria has 11 cities with population above one million and there are 23 cities with population of over 200,000. This rapid urban population growth is associated not only with considerable physical expansion of the cities and dispersal of urban land uses, but also, considerable increase in the demand for all forms of transport. Currently, transport infrastructure and services in Nigeria cities are not growing at a commensurate rate with urban population growth. In fact, the demand/supply imbalance existing in most Nigeria cities result in widespread road congestion overcrowded buses delays and parking problems.

On institutional issues, it is a recognised that urban transport activities in Nigeria are characterized by the proliferation of management bodies which create overlaps and conflicts in the provision and management of urban transport infrastructure and service and in the enforcement of traffic laws and regulation. To make matter worse, the present system of arrangement puts urban transportation under the control of the Local Government Areas which cannot cope with the magnitude and complexity of urban transport system due to lack of resources and technical experts to handle the situation.

2.4 The historical development of air transportation infrastructure in Nigeria

The history of air transportation development in Nigeria started from the period after World War II when flights were operated by the British Royal Air Force (RAF) between Britain and her colonies in West Africa. At the end of the war in 1945, the four British colonies in West Africa-Nigeria, Gold Coast (now Ghana), Sierra Leone and Gambia (now Banjul) joined together and established the West African Airways Corporation (WAAC) with its headquarters in Lagos to continue the link between these countries and between them and Britain. (Akpogomeh, 1995). When these countries became independent (Ghana in 1957 and Nigeria in 1960), WAAC was disbanded so that these independent countries could own their own national airlines. As soon as Nigeria became independent in 1960, the Federal government of Nigeria established the Nigerian Airways Limited as the national carrier, 100 per cent owned by the Nigerian Government. Right from its inception, the Federal Government of Nigeria spent huge amounts of capital on the development of air transportation. This led to importation of improved modern aircrafts (DC-3, F27, F28 and later Dc-8, Dc-10, Boeing 707, Boeing 737 and Boeing 474) into the country. Subsequent tremendous increase in air traffic in the country were well documented during this period (Filani, 1975, Bardi, 1987, Ogunjumo (1992) and Akpoghme, 1995). The Nigerian Airways operated international flights to East and West Africa, parts of Europe, North America and Asia. It also enjoyed the monopoly of providing domestic air services in the country until the 1980's when increase in demand for air transport and public complaints about the shortcomings of the Nigerian Airways forced the government to permit the participation of private airlines in domestic aviation. The National Civil Aviation Policy (NCAP) of 2001 formalized the deregulation and privatization of the aviation sector in Nigeria. Onokala (2002) noted that the civil aviation sector in Nigeria has shifted from a purely public sector of the 1970's and 1980's to a liberalized sector with private sector participation in airline business, in line with the global trend.

In fact, the last two decades in Nigeria has witnessed an enormous expansion in both domestic and international traffic but domestic traffic predominates and jumped from 5.2 million to 8.4

million between 2001 and 2007. The situation in Nigeria is similar to what is reported at the global level where the International Air transport Association (IATA) reported world total domestic air passenger traffic of 1,249,000,000 in 2007 indicating 8 percent growth over the number for 2006 (IATA, 2008).

The private airlines currently operating within Nigeria include Arik Airlines, Air Peace, Aero Contractors, Bellview Airlines, Associated Airlines, Capital Airlines, Overland Airlines, Chanchangi Airlines among others. Several international airlines also operate in Nigeria. The international airports are at Abuja, Lagos, Enugu, Port Harcourt and Kano. Over the years, the number of airports in Nigeria, which are owned by the government, has steadily increased. Presently, Nigeria has 22 airports and many of them are currently being upgraded to international airports that can handle modern aircrafts. Due to its inherent advantage of speed in a situation where large spatial disparities occur in resource endowment and production as in Nigeria, the important and inevitable role of air transportation in the movement of people across the country has contributed a lot to the Nigeria's economic development.

Onokala (2012) observed that due to improved economic conditions, Nigerians are willing to travel by air more than ever before. Bardi (2017) studied the spatial structure and growth trend of domestic air passenger traffic in Nigeria. He confirmed that there has been a steady growth in domestic air passenger traffic in Nigeria and that the domestic air passenger network changed from partially connected networks in 2003 and 2006 to a Hub-and Spoke system in 2010 and 2014 as most airlines chose Lagos and Abuja as their centers of operation and their Hubs. The existence of these hubs indicate the maturity of the air transport network in the country.

Therefore, the air transportation mode is growing at an alarming rate and has huge potential for the development of tourism in Nigeria. In fact, the airways transportation in Nigeria has a lot of room for expansion.

3.0 The journey so far and the way forward

The journey so far has indicated that there has not been a balanced development of the country's transportation system. Presently, with the marked increase in road construction and the simultaneous operational and organizational difficulties being experienced by the railway and inland waterways systems, the movement of people and all types of goods all over the country is dominated by road transport. In fact, roads are over-used and misused in Nigeria while the waterways have a lot of capacity that is not being utilized. Railways and pipelines were heavily used in the past but at present they are sparingly used while the airways are heavily used but still need a lot of improvement and expansion.

The major results of this pattern of predominant use of road transportation over all the other modes of transportation in Nigeria are environmental problems of road transportation. Road construction projects and the utilization of road facilities are associated with irreversible damage to the environment. Some of these problems include landslides from severe erosion, destruction of land and forest resources, problems of road maintenance, air, noise and environmental pollution as well as traffic congestion and their contribution to climate change. Evidences of environmental problems of road transportation are glaring in different parts of the country. Environmental Impact Assessment (EIA) need to be enforced before all transportation projects are undertaken. Better road maintenance practices should also be enforced. Ya Wu & Li Zhang (2017) discussed the use of electric vehicles for reducing air pollution from vehicles in developing countries such as Nigeria. Presently, only a few electric vehicles are used in Lagos roads. Increased awareness of

environmental problems of road transportation is needed. The use of non-motorized mode of transportation should also be encouraged.

On the other hand, the over-use and misuse of road transportation in Nigeria has led to high occurrences of road traffic accidents. This is an embarrassing waste of human lives and resources for the country. Since the 1980’s Nigeria had topped the list of countries in Africa and sometimes worldwide in the number of deaths from road traffic accidents. Afolabi & Gbadamosi (2017) examined the causes and consequences of road traffic crashes on Nigerian roads. They identified such causes as road, vehicle and human factors. These factors are further compounded by low level of development and integration of the country’s transport system resulting from Nigeria’s over reliance on road transportation. According to FRSC (2014), Fig 1 shows the top 10 crash-prone roads nationwide on a map and in a Table.

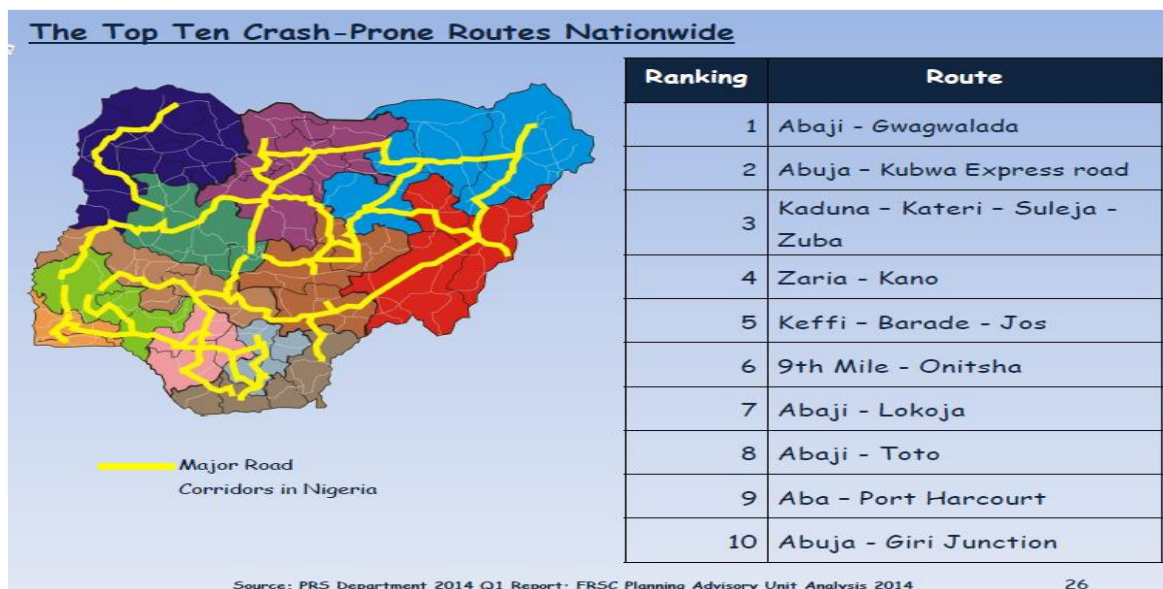


Fig. 1: The Top 10 Crash –Prone Routes Nationwide

The predominant use of the road is not only because of its inherent advantage of flexibility but also because transport development has concentrated on the road over all the other modes in Nigeria’s development process. Yet, the overuse and misuse of roads has serious negative implications for the continued economic development of the country. There is need for increasing the awareness of the Nigerians about the problems of road traffic accidents in the country by embarking on mass traffic education of road users in all segments of the society. The FRSC and other sectors like the Police should work out a better coordinated approach and more aggressive interventions on the problem of road traffic accidents in Nigeria. There is need to learn from other countries and to follow the recommendations of WHO (2013) Global Report on the Decade of Road Safety, (2010-2020).

Although the road is good for short and medium distance goods and passenger transportation, it is presently almost solely responsible for carrying people and goods for long distances all over the country. Presently, roads account for 90 per cent of import traffic, 85 per cent of export traffic and about 90 per cent of the internal movement of people and goods in the country. If the rivers

and inland waterways are not dredged and expanded, and also the railways are not expanded and modernized, this proportion is likely to rise even higher in the next few years. Another major challenge which is posed for the road transport use in the country is the use tankers for the transportation of petroleum products along the roads. This wrong use of the roads contributes a lot to the high rate of accidents and fire explosions on Nigerian roads.

The problem of poor road maintenance also contributes to the high rate of road accidents. The poor maintenance as explained earlier is largely due to the inequitable manner of sharing of the responsibilities on roads among the three tiers of government. This is because the Federal Government which is more affluent, has the least responsibility. Yet, this pattern of allocation has remained basically the same since 1926 even after a slight review in 1937 and some modifications in 1974. In fact, the generally poor standards of construction and maintenance of most roads in the country is attributed to this imbalance in the road transport sub-sector. In addition, it is not always clear to which category some of the roads belong to. Therefore, there is need to revisit this national system of allocation of responsibilities in the road transport sub-sector so as to streamline responsibilities in a more equitable manner.

More urban centers in the country also need to be linked by expressways. In addition new strategic roads are also needed to link Nigeria and other countries for example, Lagos – Cotonou highway contributes a lot to the trade between Nigeria and the Republics of Benin, Togo and Ghana. Similarly, the extension of Lagos – Badagry road for 33 kilometers to SemiPogi in Benin Republic has further strengthened these ties. There are two roads that should also be developed as part of the Mombasa-Dakar Pan African Highway. These are the Kaduna-Daura Kongolam Niger border road as well as the Lagos –Shagamu-Benin City –Asaba-Enugu – Abakaliki –Ikoma – Cameroun border roads. Moreover, more roads are needed to the tourist attraction facilities all over the country.

Over the years, the Provincial/Local Government Authorities in Nigeria have made very little success in constructing and/or rehabilitating rural roads. Yet, a good rural road network is vital and fundamental to rural economic development because without roads, the provision of other infrastructures are extremely difficult, if not impossible. It is suggested that the regional specialization approach should be used in the rural areas of Nigeria for identifying the roads to be constructed. This will enable the regions to specialize in the commodities for which they have comparative advantage and therefore result in more economic development.

The urban transport problem in Nigeria cities manifests in the form of poorly constructed and maintained urban road network and road complementary facilities as well as ineffective transport management. Onokala (2001) discussed urbanization and urban transportation problems in Nigeria cities. Nigeria cities are dominated by paratransit or intermediate modes of transport. The most common types are small 14-18 seater buses, shared-fare taxis and motor cycles and tricycles which provide main, collector and feeder services between different parts of the city. Onokala (2000) discussed the implications of the adoption of small buses for “mass Transit” on the Transport Policy of Nigeria. After struggling with many ways of handling the urban transportation problem of Lagos State without making any progress, the Lagos State Government introduced the use of big buses for the Bus Rapid Transport (BRT) System in Lagos, Nigeria on 17th March, 2008 using Public Private Partnership (PPP). The government provided the major infrastructure while the private sector provided the buses. BRT was well received in Lagos and Lamata (2016) claims that thousands of Lagos resident queue up daily to make use of the buses to enjoy lower transport fares and to beat the gridlock in the city due to their use of dedicated lanes as shown in Fig 2.



Fig. 2: Lagos Commuters Queue up to Board Lamata Buses

Due to the success of the BRT, other states of the country have introduced well organized higher capacity bus systems such as El Rufai buses in Abuja and Sullivan buses in Enugu and similar buses in other state capitals.

Table 3 shows that BRT Lite of Lagos, Nigeria is performing relatively well compared with other such systems in various parts of the world. Meanwhile, the construction a Light Railway network is going on in Badagry and it will be connected to the BRT Lite and both of them be connected to ferry/waterway transportation to Lagos Island. When this is done, it will be possible for a commuter who intends to go from Sango to Lagos Island, for example, to take a bus to Oshodi, take a train from Oshodi to Apapa, then take a ferry from Apapa to C.M.S., and then take a bus from C.M.S. to Lagos Island. This will be the first correct “mass transit” system in Nigeria using an integrated transportation network. This is in line with Onokala (2012), who recommended an integrated transportation system for Nigeria which will take into consideration the geostrategic location of the country and in which all the modes are used more efficiently in order to sustain Nigeria’s social and economic growth and enable her to compete favorably in international markets in the this era of globalization.

Table 3: Selected BRT systems in the world

NAME	CITY	COUNT RY	LENG TH (KM)	POPULATI ON (MILLION)	PEAK HOUR ONE WAY	DAILY TWO WAY
Trans milenio	Bogota	Columbia	84	7	45,000	1,300,000
Assis Brazil Bus way	Porto-Algre	Brazil	4.9	3.7	28,000	240,000
Metro bus El Trole	Quito	Ecuador	16.1	1.8	7,000	240,000
Qde-Julho bus way	Sao Paulo	Brazil	7	10	3,000	196,000
BRT lite	Lagos	Nigeria	22	15.7	10,000	195,000
SUI bus way	Curitiba	Brazil	10.1	2.7	13,600	156,000
2 blok mkota	Jakarta	Indonesia	12.9	9.8	6,500	100,000
SE bus way	Brisbane	Australia	17	1.7	18,000	150,000
Mega bus	Pereira	Columbia	16.7	0.7		45,000
Adelaide	Adelaide	Australia	3	1.1	41,000	30,000

Source: EMBARQ Newsletter (2013) World Resources Institute in “BRT in 166 Cities” available at www.WRI.org, Accessed on 7/11/2013.

It is hoped that the BRT Lite is a short and medium-term integrated transport solution for Nigeria’s problems and push the country into the same condition of other megacities of the world. For example, London, England has an underground railway system well connected to the road network. Other cities have surface systems while others combine both surface and underground systems such as Seoul in North Korea, Moscow in Russia, New York in U.S.A. and Beijing in China.

Immediate restoration and use of pipelines for the transportation of petroleum products is recommended for sanitizing the road transport sector.

The current plans for dredging the River Niger, after Environmental Impact Assessment (EIA) has been undertaken. This will help to reactivate the Lower Niger for river transportation and also revive the old river ports of Sapele, Onitsha, Idah, Baro, Ajaokuta and Makurdi for the transportation of agricultural commodities as well as boost tourism industry in Nigeria. The construction of the NGN117 Billion Second Niger Bridge started in 2014 and will be helpful in the development of the road network within the region. The project will be executed under Public Private Partnership (PPP) arrangement for 25 years. There are still more bridges needed across many other rivers in the country. If the inland waterways are developed agricultural products from the Middle Belt of Nigeria, especially those from Makurdi and Lafia, can be transported to Onitsha and Port Harcourt through the inland waterways. The Ajaokuta Steel Complex will also benefit from using the waterways for importing scrap metal and other raw materials through Warri port. In addition, Onitsha, a major commercial and industrial town located on the River Niger will benefit from import and export cargo movement using the inland waterways.

If the present imbalance of the transport sector is to be corrected and the goals arising from increasing industrialization be actualised, the Nigerian railway system must be resuscitated so that the railway can perform its proper role in the transportation system of the country. The construction of a standard gauge rail line must be undertaken in order to eliminate the sharp curves and steep gradients which reduce speed and cause frequent derailment and excessive wear of the wheels. The new railway line will replace the present railway line which consists of two major lines from Lagos and Port Harcourt towards the northern Nigeria which were essentially outward looking since they were constructed to meet the colonial needs of the export of agricultural and mineral resources out of the country. The need for the addition of east-west connections and other linkages is now manifest considering the volume of freight and passenger interchange between the various regions of Nigeria. In fact, feeder roads to the railway lines instead of roads parallel to the railway lines should be emphasized. This will aid seamless transport connectivity.

Nigeria should also be prepared to take its place as a regional hub and develop a railway with Institute Study (1961) recommended that the Nigerian railway corporation should develop an aggressive public relations and commercial policy so that the railway system can attract traffic from Niger Chad Republics but this was not pursued vigorously. Therefore, the 25-year Strategic Vision for Nigerian Railway System plans to extend the railway network to Republic of Benin through Ilaro; Republic of Niger through Kaura Namoda; Chad Republic through Maiduguri and Cameroun through Yola.

Government can revive the railway system in the country through private sector participation which is capable of using market forces. This can be done through private sector participation and regional concessions with direct access and connectivity to the major parts of Lagos, Port Harcourt, Warri and even Calabar. A concessioned railway implies Public Private Partnership (PPP) on existing railway facilities and services.

Air transport is the most efficient and most reliable modern means of moving people, goods, services and information in the world today. Its major advantage is speed but it is very expensive. The unprecedented economic boom which the country has experienced in the past few decades has enhanced the standard of living of many Nigerians who are increasingly becoming aware of the advantages of travelling by air. This awareness manifests itself in the increasing number of Nigerian business men and women, professionals and others who travel by air not only to different parts of Nigeria but also to different parts of the world. In addition, the bad condition of Nigerian roads, especially roads that link the major cities and other production centers, have forced government officials, business executives and other personalities to abandon road transport and patronize air transport. Therefore, geographical, economic and socio-cultural factors as well as the poor condition of Nigerian roads have stimulated air transport development in Nigeria.

However, there is urgent need for airport expansion in Nigeria. More international airports and other airport hubs in addition to the existing two of Lagos and Abuja are needed to handle the increasing air traffic in the country. Already, in addition to existing airports, there are newer airports in Owerri, Uyo, Warri, Bauchi, Gombe and Asaba which are either under construction or have been recently completed while plans are underway to construct more airports in other parts of the country such as Oba, near Onitsha and the University town of Nsukka, near Enugu. There are also many public and private landing strips located at places approved by the government.

Airport expansion should also take the strategic location of the country into consideration by planning the expansion in a way that it will accommodate airway connections to neighboring countries as well as tourist attractions within the country. This can only be achieved in a properly

integrated transportation system where air transport is properly integrated with waterways, roads and railway transportation. It is also important to ensure that, in spite of the increasing demand for air transportation, the quality of both the domestic and the international air transportation services should not be compromised. Schedules must be strictly kept, boarding must be orderly, and loss of luggage and other problems must be reduced to the barest minimum. Recent improvements in the airline industry include the use of ICT and e-booking of flights, use of standard aircrafts and improved management. In addition, air transportation safety standards needs to be improved upon and sustained.

4.0 Conclusion

The construction of an entirely new railway network is essential in transport development in Nigeria. Other necessary interventions include: the renovation of pipelines used for the transportation of fuel and other petroleum products, as well as the modernization and expansion of the ports and inland waterways. When all these are accomplished, the transport system of the country will be adequate for optimum economic development in the 21st Century. The paper concludes that there is still need for research, transportation planning, and adequate collection of data to inform future transport policies.

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