FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

REVIVING THE COMATOSE ARTERIES AND BLOOD OF THE NIGERIAN ECONOMY: AN INESCAPABLE ROUTE TO SUSTAINABLE NATIONAL DEVELOPMENT

BY:

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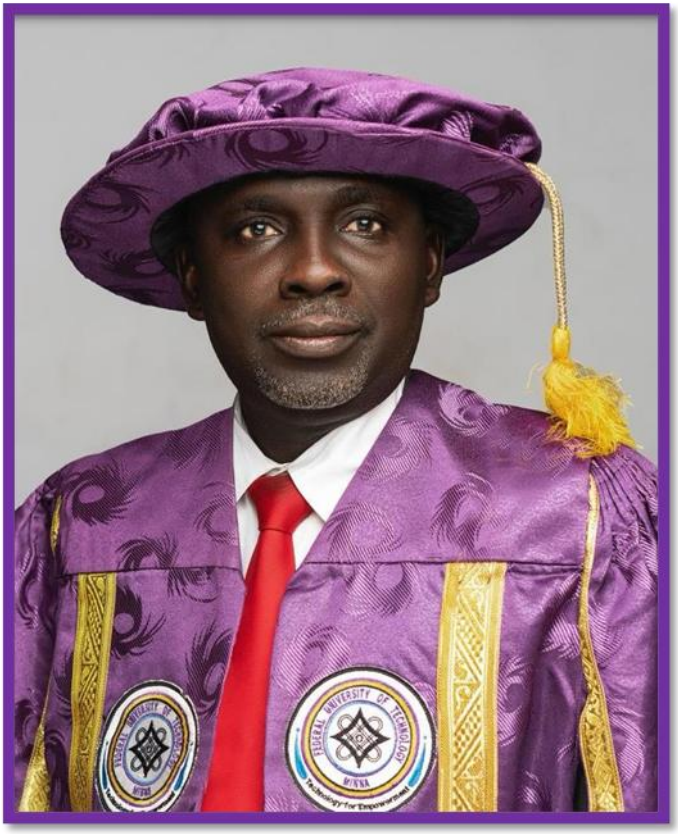

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1.0 INTRODUCTION

As arteries and blood are critical to the survival of any living organism, especially animals, so also is the transport to the growth and development of human economies and societies. The Holy Scriptures in (Deuteronomy 12:23b) says, "for the blood is the life and you must not eat the life with the meat" This underscores the importance of blood; however, blood without the arteries cannot give life. To provide life, blood must flow through the arteries. In the same way, transport forms the arteries and blood of the human economy and is the basis for the effective functioning of modern society. This is why the US Department for Transport (2019) asserts that transport is the life wire of the economy. Some scholars described transport as 'the engine of development', while others say 'it is the catalyst of economic development'. It is an essential economic growth facilitator, the backbone of economic development for many industrialised countries (Lakshmanan, 2011; Oluwole *et al*, 2017). The above depicts transport's symbiotic and critical role in developing economies and human society.

The relationship between transport and economic development is a matter of much theoretical interest and practical importance, and one that has received considerable attention over many years in both developed and less developed countries (Ojekunle 1998). It is also an extremely topical and controversial area of study. Economists aim to include transport infrastructure development and improvement in their theories of regional economic growth. Geographers are more concerned with the spatial implications of such development. On the other hand, they would like to know more about the relationship since it would help allocate government expenditure in the economy (Ojekunle 1998). The Engineers are interested in building innovative, safe

infrastructure that makes transport operations seamless and sustainable. At the same time, environmental scientists are keen on the environmental impact of transport on the environment.

As transport plays a crucial role in a country's political, economic and social progress, it must be considered in every national and regional development planning stage. No wonder Munby (I968) and Ojekunle (1998) said that, "there is no escape from transport." In advanced countries, policymakers and industry leaders have paid much attention to transport innovation during the formative years of industrial growth. Today, new economic planning strategies require modifying or renewing inherited transport systems. In less-developed countries, there is widespread concern for transport in the context of the desire to promote rapid economic development.

Despite the critical and indispensable role of transport in social and economic development, adequate attention has not been given to the development of transport infrastructure in Nigeria. This results in deplorable transport infrastructure and a comatose transport system which requires urgent revival. This inaugural paper therefore tries to examine the comatose and deplorable condition of the Nigerian transport infrastructure and the traffic flow problems, as well as my contributions to knowledge in this important field, with a view to coming up with strategies for improvement to ensure sustainable economic prosperity and development of Nigeria.

2.0 THE ARTERIES AND BLOOD OF THE NATIONAL ECONOMY

Arteries and blood are the life wire of every animal, including humans. When the arteries are blocked, the blood stops flowing, ultimately resulting in death. Figure 1 shows the image of human arteries. Transport operates as a system comprising six (6) basic components through which it functions. The transport components include the way, the terminal, the vehicle, the motive power, the regulatory policy and the operators. The way is the channel through which transport operates, which includes roadways, railways, air routes, waterways, pipelines, among others. The terminals are transfer points of cargoes, freight, and passengers from one mode of transport to another. Vehicles are the means of conveyance of goods and people, such as motor cars, trains, wagons, aircraft, ships, boats, etc. The motive power is the engine that propels the vehicle; it is the power that moves the vehicle. The fifth component is the rules and regulations guiding the operations to guarantee safety and efficiency. The last component, the operator, is the driver who operates both the vehicle and the motive Power.

Mr Vice Chancellor, in this lecture, the way and the terminals constitute the arteries. At the same time, the vehicles, which are the means of conveyance and the motive power, are the blood of national economies. The same way the arteries in human body provide the channel or route through which the blood flow into every part of human body, so also is the same way the fixed transport infrastructure such as roads, railways, pipelines, waterways and terminal facilities such as seaports, airports, motor parks, rail stations etc. Provide the channel through which traffic flows to every sector of human society.

Figure 1. Human blood circulation system
Source: https://enorcerna.com/wiki/cardiology, 2015

Traffic that flows in the economic landscape, whether in the rural and urban centres, is a product of land use and transport interactions. Effective interaction of different land uses is impossible without a functioning transportation system. Therefore, traffic that flows in the forms of cars, buses, trucks, articulated vehicles, trains, pedestrians, tricycles, and motorcycles, among others, is the blood of any economy. Figure 2 shows Nigeria's road transport network and average daily traffic flow, representing the country's national economic arteries and blood.

Figure 2: Road network and traffic flow
Source: rowlandadewumi.com, 2021

Mr Vice Chancellor, sir, as the inability of blood to flow in the human body will result in death, so also is the inability of traffic to flow in the transport network, which will result in social and economic paralysis and comatose. Therefore, all other sectors of the economy and society depend heavily on the efficient and effective functioning of the transport system. (Ojekunle 1998b, Ajiboye & Afolayan, 2009).

3.0 RELATIONSHIP BETWEEN TRANSPORT AND DEVELOPMENT

Because of its intensive use of infrastructure, the transport sector is an essential component of the economy and a standard tool used for development. This is even more evident in a global economy where the mobility of people and freight, including information and communication technologies, increasingly drives economic opportunities. A relation between the quantity and quality of transport infrastructure and the level of economic development is apparent. High-density transport infrastructure and highly connected networks are commonly associated with high levels of development (Rodrigue 2024). For instance, the transport sector contributed approximately **7% of the global GDP**, amounting to approximately **USD 6.8 trillion** in 2022.

Mr. Vice Chancellor, sir, it is a verifiable fact that when transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multiplier effects, such as better accessibility to markets, employment, and additional investments. When transport systems are deficient in terms of capacity or reliability, they can have an economic cost, such as reduced or missed opportunities and a lower quality of life (Rodrigue *et al*. 2024).

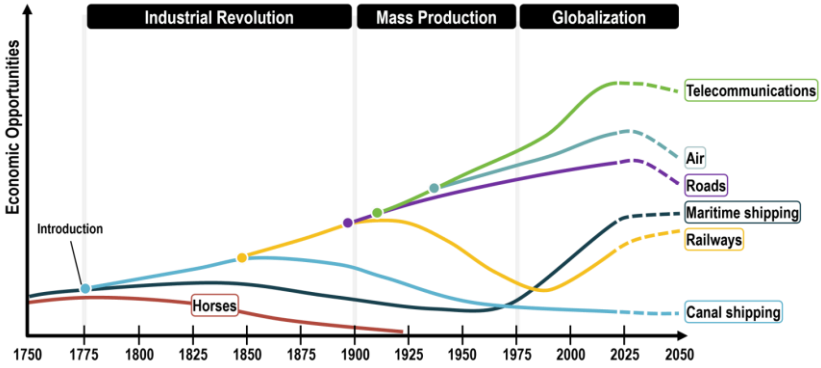

Figure 3: Transport and Economic Development Relationship
Source: Jean-Paul Rodrigue *et al,* 2024

Phases of Global Transport and Economic Development

Since the beginning of the Industrial Revolution, transportation developments have created growing economic opportunities. At each development stage of the global economy, a particular transport technology has been developed or adapted with an array of impacts. Economic cycles are associated with various innovations, including transportation, influencing economic production, distribution, and consumption opportunities. Figure 3 shows the relationship between different modes of transport and stages of economic development. Historically, six major waves of economic development where a specific transport technology created new economic, market, and social opportunities can be identified (Rodrigue *et al*. 2024):

Seaports. The historical importance of seaports in trade has been enduring. This importance was reinforced by the early stages of European expansion from the 16th to the 18th centuries, commonly known as the Age of Exploration. Seaports supported the early development of international trade through colonial empires but were constrained by limited inland access. Later in

the Industrial Revolution, many ports became important industrial platforms. With globalization and containerization, seaports have increased their importance in supporting global trade and supply chains. The cargo handled by seaports reflects the economic complexity of their hinterlands. Simple economies are usually associated with bulk cargoes, while complex economies generate more containerized flows. Technological and commercial developments have increased reliance on the oceans as an economic and circulation space.

Rivers and canals. River trade has prevailed throughout history, and even canals were built where no significant altitude change existed since lock technology was rudimentary. The first stage of the Industrial Revolution in the late 18th and early 19th centuries was linked with the development of canal systems with locks in Western Europe and North America, mainly to transport heavy goods. This permitted the development of rudimentary and constrained inland distribution systems, many of which are still used today.

Railways. The second stage of the industrial revolution in the 19th century was linked with the development and implementation of rail systems, enabling more flexible and high-capacity inland transportation systems. This opened substantial economic and social opportunities through the extraction of resources, the settlement of regions, and the growing mobility of freight and passengers.

Roads. The 20th century saw the rapid development of comprehensive road transportation systems, such as national highway systems and automobile manufacturing, as a major economic sector. After the Second World War, individual transportation became widely available to mid-income social

classes. This was associated with significant economic opportunities to service industrial and commercial markets with reliable door-to-door deliveries. The automobile also permitted new forms of social opportunities, particularly with suburbanization.

Airways and information technologies. The second half of the 20th century saw the development of global air and telecommunication networks in conjunction with economic globalization. New organizational and managerial forms became possible, especially in the rapidly developing realm of logistics and supply chain management. Although maritime transportation is the physical linchpin of globalization, air transportation and IT support the accelerated mobility of passengers, specialized cargoes, and their associated information flows.

No single transport mode has been solely responsible for economic growth. Instead, modes have been linked with the economic functions they support and the geography in which growth occurs. The first trade routes established a rudimentary system of distribution and transactions that would eventually be expanded by long-distance maritime shipping networks and the setting of the first multinational corporations managing these flows. Major flows of international migration since the 18th century were linked with the expansion of international and continental transport systems that radically shaped emerging economies such as North America and Australia. Transport catalysed these migrations, transforming many nations' economic and social geography (Peter *et al*, 2015; Department for Transport, 2019).

Furthermore, transportation has been a tool of territorial control, particularly during the colonial era, where resource-based transport systems supported the extraction of commodities in the developing world and forwarded them to the industrialising nations of the time. The goal to capture resources and market opportunities was a strong impetus in the setting and structure of transport networks. More recently, port development, particularly container ports, has been of strategic interest as a tool of integration into the global economy, as in China. There is a direct relationship, or coordination, between foreign trade and container port volumes, so container port development is commonly seen as a tool to capture the opportunities brought by globalisation. The growth of container shipping has consistently been 3 to 4 times higher than the GDP growth rate, highlighting a significant multiplier effect between economic growth and container trade. However, this multiplying effect has substantially receded since 2009, underlining the maturity of the diffusion of containerisation and its dissociation from economic growth.

Due to demographic pressures and urbanisation, developing economies are characterised by a mismatch between the limited supply and growing demand for transport infrastructure. While some regions benefit from developing transport systems, others are often marginalised by conditions in which inadequate transportation plays a role. Transport by itself is not a sufficient condition for development. However, the lack of transport infrastructure can be a constraining factor in development. The lack of transportation infrastructure and regulatory impediments jointly impacts economic development by conferring higher transport costs, but they also delay the rendering of supply chain

management. A poor transport service level can negatively affect regions' competitiveness and economic activities and thus impair the regional added value, economic opportunities, and employment.

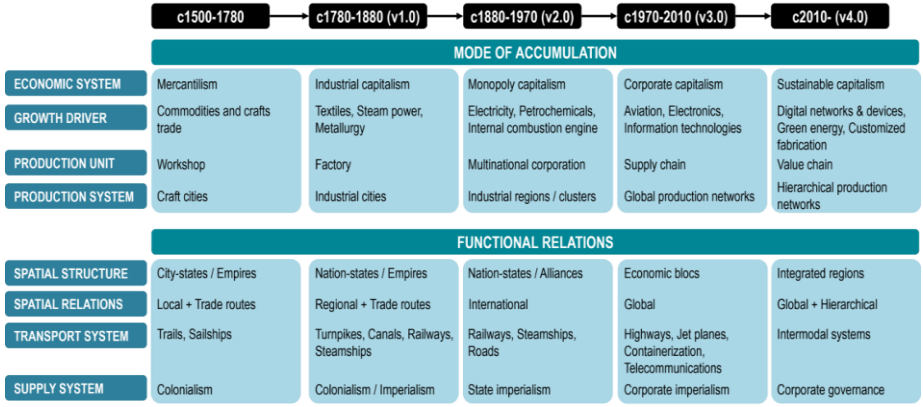

Figure 4: Phases of Global Transport and Economic Development
Source: Rodrigue *et al*, 2024

4.0 FACTORS INFLUENCING TRANSPORT DEVELOPMENT

As transport influences development, so does development; the relationship is symbiotic in nature. At different geographical scales, different factors exert different degrees of influence. At a local level, topography becomes the key environmental consideration, while the culture of the people and settlement patterns are factors considered when looking at the people's history. In addition, road transport becomes the most appropriate mode of transport when considering technology, administrative zoning, or division as the major political consideration, and employment and effective distribution of goods and services become the main focus when considering the economic impact.

At the Regional level, climate is the subject of interest, while urban systems and patterns are issues for historical consideration. Identifying appropriate transport technology, the attention will focus on railways, canals and inland water transport. The major political considerations at this level are taxation and regulations. The major economic issues should be modal competition and the complementarity of modes.

At the national or transnational scale, distance becomes the major environmental consideration, the issue of colonialism, nation-state, and imperialism become historical considerations, corridors and sea routes become technological considerations, and the signing of trade agreements becomes a matter for political consideration, while market coverage and share become economic considerations.

Finally, oceanic masses are the environmental consideration at the global scale, while globalization is the only historical consideration. On one hand, air transport and telecommunication are key issues when considering appropriate technology, while on the other hand, multi-lateral agreements with the WTO become political considerations, and interdependence and comparative advantages are key economic issues to be considered at the global level. Figure 5 shows various issues that influence the development of transport.

Scale	Environmental	Historical	Technological	Political	Economic
Local	Hydrography and geomorphology	Culture and settlement patterns	Roads	Zoning	Employment and distribution
Regional	Climate	Urban system	Railways and canals	Taxation and regulations	Modal competition and complementarity
National / Transnational	Distance	Nation state / Colonialism / Imperialism	Corridors and sea routes	Trade agreements	Markets
Global	Oceanic masses	Globalization	Air transport and tele-communications	Multilateral agreements (WTO)	Interdependency and comparative advantages

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Figure 5: Factors influencing transport development
Source: Jean-Paul Rodrigue *et al*, 2024

5.0 NIGERIAN TRANSPORT DEVELOPMENT

Nigeria has a long history of transport development, particularly road and rail transport. Road and rail transport development dates back to the colonial era. The beginning of road transportation can be traced back to Lord Lugard's attempt in 1904 to build a mule route connecting the two Northern Nigerian cities of Zaria and Zungeru. Later, the route from Zaria to Sokoto, then Katsina and Maiduguri, was expanded. However, the road between Ibadan and Oyo, built in 1906, was the first road built in Nigeria specifically for vehicular transportation.

Rail Transport in Nigeria started as far back as 1898. The British colonial Government built the first railroad and it was gradually extended to other parts of the country. The trains used were diesel-engine operated and run by the National Railway Corporation (NRC), which owned about 200 locomotives, and fewer than 25 % of them are currently functional. The Baro to Kano railway was established on October 3rd 1912. The Lagos Government Railway was also established the same year, and its operation continued for a network of 3,505 kilometres (2,178 mi) of single-track lines 1,067 mm (3 ft 6 in) gauge, as well as 1,435 mm (4 ft 8 1⁄2 in) from Abuja to Kaduna.

Shortly after, the Nigerian Railway Corporation (NRC) gained its name and passed an act that would guide the legal right to construct and operate rail service in Nigeria (Elias 2025)

5.1 Comatose Road Transport Infrastructure in Nigeria

Nigeria's roads and highways form the backbone of the country's transport network, as these arteries handle 90% of all passenger and freight traffic (NIIMP, 2014). The road network in Nigeria has an

estimated length of 200,000km, of which the Federal Government owns 18%, the state government owns 16%, and the local Government owns 66% (mostly earth roads).

The road sub-sector is the largest, contributing N2.7 trillion ($7.2bn) to GDP in 2020 and N2.4 trillion ($6.4bn) in 2021. The Government focused on servicing existing roads, many of which are in poor condition, and constructing new ones. In 2021, the Nigerian Government earmarked N168bn ($451.2m) for road construction, rehabilitation and dualization. The package also sets aside N54bn ($144.2m) for building and renovating bridges, and N4 bn ($10.7m) specifically for the rehabilitation of a mainland bridge in Lagos (NIIMP 2014).

With the marked increase in road construction and the simultaneous operational and organisational difficulties 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 overused and misused in Nigeria, while the waterways have a lot of capacity that is not being utilised. Railways and pipelines were heavily used in the past, but at present, they are used sparingly. Airways are heavily used, mainly by the rich and middle class, but still need a lot of improvement and expansion.

Despite the huge public and private investment in road transport in Nigeria, the condition of road infrastructure is very deplorable due to overuse, misuse and neglect and many other factors.

5.2 Causes of Comatose Transport Infrastructure in Nigeria

Numerous studies (including Ojekunle 2024) have revealed the causes of deplorable transport infrastructure in Nigeria. A combination of factors, including poor maintenance culture,

inadequate funding, corruption, and weak enforcement of policies, causes the deplorable condition of road transport infrastructure in Nigeria. The key causes are discussed below:

i. **Poor Maintenance Culture:** Many roads in Nigeria deteriorate due to a lack of routine and preventive maintenance. Government agencies responsible for road maintenance often fail to act promptly, allowing minor damages to escalate into major issues.
ii. **Inadequate Funding and Budgetary Constraints:** Insufficient budget allocations for road construction and repairs contribute to the poor State of roads. Delayed or incomplete disbursement of funds leads to abandoned projects and poorly executed repairs.
iii. **Corruption and Mismanagement:** Embezzlement or diversion of funds meant for road infrastructure development is common. Contractors often deliver substandard work due to compromised project supervision and bribery.
iv. **Poor Quality of Construction Materials and Workmanship:** The Use of substandard materials leads to roads that deteriorate quickly. Lack of strict quality control and enforcement of construction standards results in roads failing before their expected lifespan.
v. **Overloading and Heavy Vehicular Traffic:** Excessive weight from overloaded trucks and trailers causes roads to wear out faster and earlier than the designed lifespan. Many roads are not built to withstand the heavy-duty vehicles that frequently use them.
vi. **Lack of Proper Drainage Systems:** Poorly designed or non-existent drainage systems lead to waterlogging, which

weakens road foundations. Flooding during the rainy season accelerates road damage.

vii. **Political Interference and Poor Policy Implementation:** Road construction projects are often influenced by political interests rather than actual need. Inconsistency in policies due to changes in the Government leads to abandoned or poorly executed projects.

viii. **Vandalism and Theft of Road Infrastructure:** Theft of road signs, guardrails, and drainage covers affects road functionality and safety. Vandalism of key infrastructure elements increases the cost of maintenance.

ix. **Urbanization and Poor Road Planning:** Rapid urbanization without proper road network expansion leads to congestion and excessive wear and tear. Many cities lack proper road networks, leading to the overuse of the few available roads.

x. **Security Challenges:** Insecurity in some areas prevents contractors from completing road projects. Banditry, kidnappings, and insurgency make road travel risky, discouraging investments in road infrastructure. Figure 6 shows various causes of bad road conditions in Nigeria. These include excessive loading of heavy-duty vehicles, weather, poor drainage, poor construction materials, wrong construction and poor maintenance.

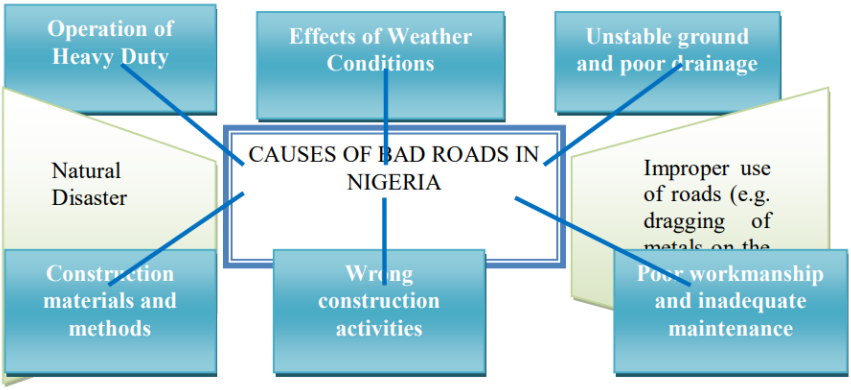

Figure 6: Causes of deplorable road conditions in Nigeria
Source: Enwerem and Ali, 2016

Most roads in Nigeria are substandard, with frequent potholes caused by a poor maintenance culture. This often causes frequent damage to products and vehicles, severely increasing business distribution costs and causing a lot of unproductive time spent in traffic trying to get products and services to customers or the final destinations.

Various studies have revealed that roads are bad all over the country. Some of them are Benin bypass (located in the Southern part of the country), Lokoja-Ajaokuta (North Central), Onitsha-Enugu Roads (Eastern part), Agbara and Lagos-Sagamu-Ore-Benin and Ogbomoso-Oyo Roads (Ogun and Oyo States, respectively, in the western part of the country). Others are Minna Bida and Mokwa-Jebba Roads, Aba-Obigbo and Idoma-Benue highway; all these are arteries that link the Northern and Southern parts of Nigeria, to mention a few. Plates 1, 2, 3, 4, and 5 show images of the current condition of many roads in Nigeria.

Plate 1: Enugu-Onitsha Road in a Deplorable Condition
Source: https://www.bing.com/images/search?q=images+of+enugu-onitsha+road+deplorable+condition

Plate 2 Lagos Seaport Access Road in Nigeria
Source: https://www.bing.com/images/search?q=images+of+enugu-onitsha+road+deplorable+condition

Plate 3: Okene Road in Kogi State
Source: https://www.bing.com/images/search?q=images+of+enugu-onitsha+road+deplorable+condition

Plate 4 Poor Road Condition, Benin-Auchi Road
Source: https://www.bing.com/images/search?q=images+of+enugu-onitsha+road+deplorable+condition

Plate 5 Deplorable Road Condition of Ogbomoso - Oyo Road
Source: https://www.bing.com/images/search?q=images+of+enugu-onitsha+road+deplorable+condition

5.3 Adverse Effects of Comatose Road Infrastructure on Nigerian Development

Due to inadequate infrastructure, Nigeria loses 2% of its Gross Domestic Product (GDP) yearly. (ICRC 2017). The following constitute the adverse effects of comatose road transport infrastructure in Nigeria.

Traffic Congestion Problems
Delay in goods transportation and distribution
High cost of freight transport and passenger movement
Accidents problems
Environmental hazards

6.0 MY CONTRIBUTIONS TO REVIVE THE COMATOSE TRANSPORT INFRASTRUCTURE (ARTERIES) AND TRAFFIC (BLOOD) IN NIGERIA

Mr. Vice Chancellor Sir, as a transport researcher, my contributions to the field of logistics and transport technology are mainly to unravelling the underlying causes of comatose transport infrastructure and traffic problems in Nigeria, mitigating its adverse effects and developing various strategies for reviving the country's transport system. My contributions towards reviving the comatose arteries and blood of the Nigerian economy can be discussed under three major areas, namely;

Research activities
Consultancy activities
Teaching
National /Community Services

6.1 Research Activities

6.1.1 Modelling trip or traffic generation and attraction

My journey into the world of transport research began in 1991 when I conducted a survey on the vehicular traffic flow pattern and characteristics along Enugu and Onitsha Express Way in the then Old Anambra State. That research aimed to provide information that was needed for transport system performance monitoring and evaluation. The Federal Road Safety Commission (FRSC) financed the study, where I served as a Corper. The second attempt was made while pursuing my Master's degree at the University of Ilorin when I investigated the effectiveness of socio-economic factors in estimating trip generation and Attraction of an educational land use (Ojekunle 1994). At that time, research efforts at predicting trip generation and Attraction were focused mainly on residential,

industrial and commercial land uses; little or no research was conducted on predicting or estimating trip generation and Attraction of educational land uses using socio-economic factors. The research results showed that socio-economic factors are too weak to estimate or forecast trip generation and Attraction of an educational land use.

Furthermore, the need to advance the frontier of knowledge in trip generation and Attraction led to another study conducted in Niger State **(**Ojekunle *et al* **2021)** to develop trip generation model for inter-city travels of selected cities in the State. Using multiple stepwise regression model analysis, six independent variables, namely: travel distance (TD), travel time (TT), population (PP), public institution (PI) and fare charged (FC), were regressed against inter-urban travel flow (ITF).

Table 1. Model summary.

Model	R	R Square	Adjusted R Square	Std. error of the estimate
1	0.999a	0.999	0.997	74.510
2	1.000b	1.000		

aPredictors: (Constant), population (PP); bPredictors: (Constant), population (FC).
Source: Ojekunle *et al,* 2021

However, only population (PP) and fare charged (FC) were good and significant for explaining the variation in the flow of inter-urban trips in the State. Figure 7 shows the spatial flow of intercity trips in Niger State. A similar study was also conducted to ascertain the influence of socio-economic variables on households' travel

behaviour in Minna, the findings revealed that the number of cars, occupation, household size, number of employed household members, position in the family and car ownership have significant influence on households' travel in Minna. (Owoeye and Ojekunle 2018).

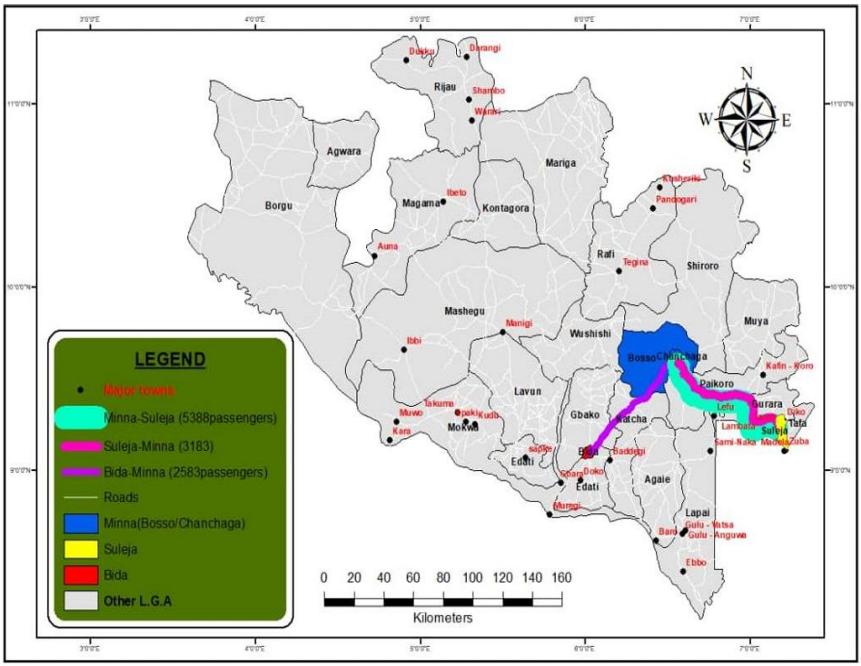

Figure: 7 Inter-city passenger trip generation in Niger State
Source Ojekunle *et al*, 2021

The need to understand the intricacies between land use and the transport system led Ojekunle. and Owoeye (2018) to study the spatial pattern of household travel in Minna. The city was divided into 14 residential zones to generate an origin and destination matrix. The study reveals that trip generation and Attraction significantly differ among different city residential densities. The

variance analysis reveals a significant difference in trip distances covered by different residential areas in the city with a p-value of < 0.001. Based on our findings, we recommend creating a spatial balance in the location of services and land use activities across the residential densities, as well as providing an effective and efficient public transportation system for the city residents. Figures 8, 9, 10 and 11 show the spatial flow of the trip generation pattern across different areas in Minna.

Mr. Vice Chancellor, there are several other contributions made in this area of urban travel that time and space will not permit to review all. (Ojekunle and Owoeye 2018; Oluwole *et al* 2018; Ojekunle *et al* 2018).

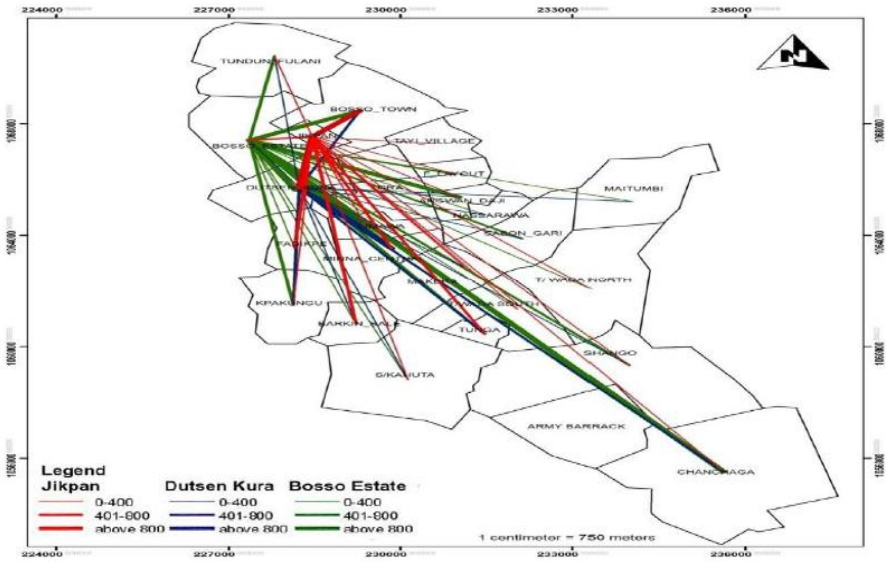

Figure 8: Spatial pattern of trip generation in Dutse Kura and Bosso Estate, Minna City

Source: Ojekunle *et al* 2018

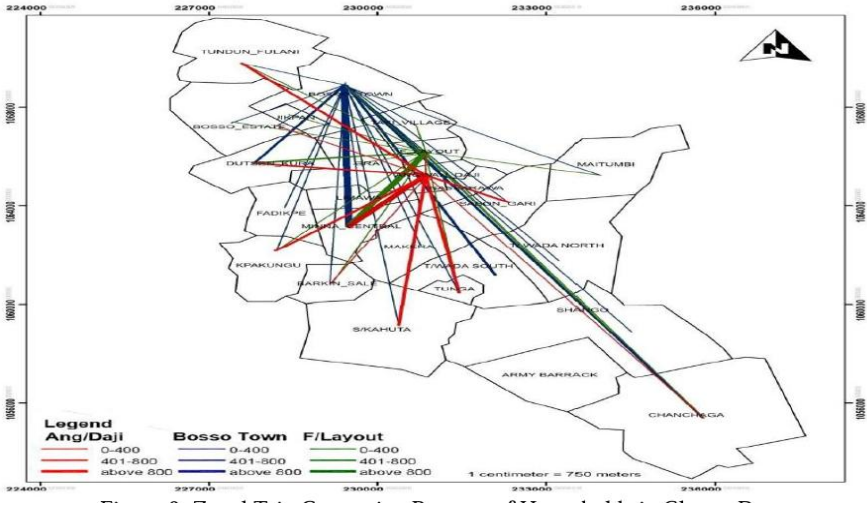

Figure 9: Spatial pattern of trip generation in Bosso Town, Minna City

Source: Ojekunle *et al* 2018

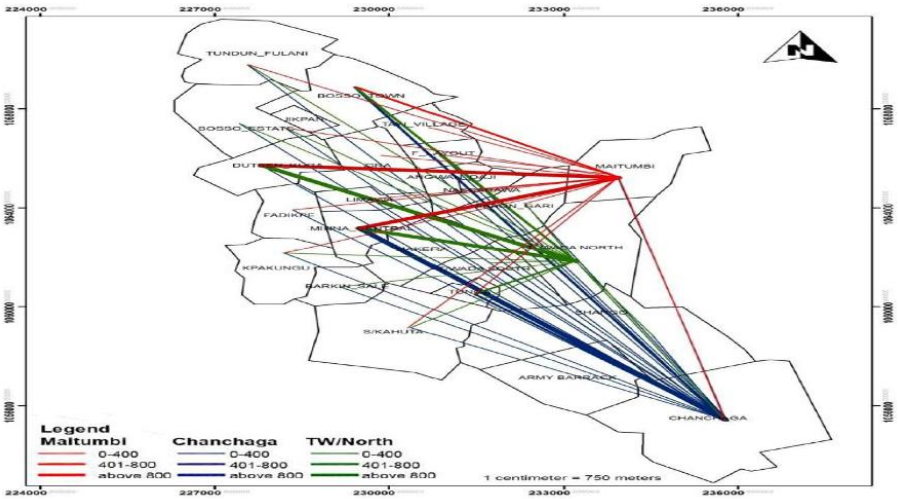

Figure 10: Spatial pattern of trip generation, Chachanga in Minna City

Source: Ojekunle *et al* 2018

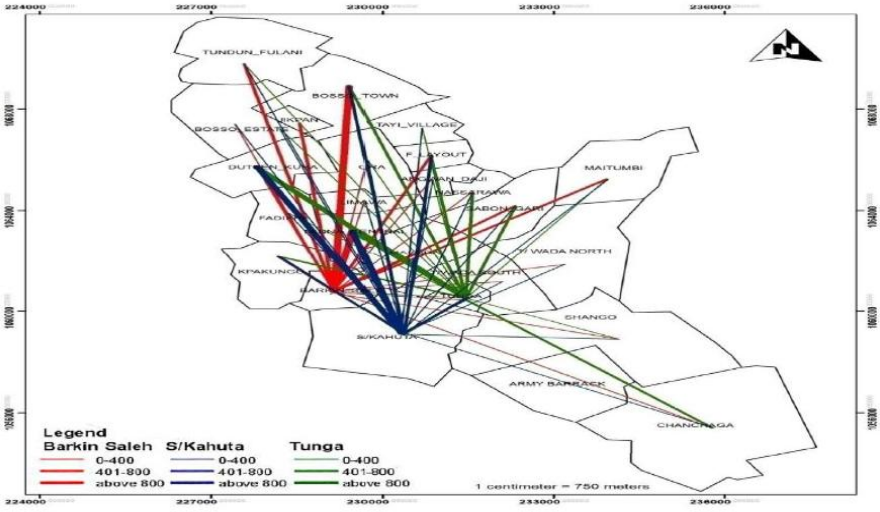

Figure 11: Spatial Pattern of Trip Generation by Barkin Saleh, Saka-kauta and Tunga areas of Minna City
Source: Ojekunle *et al*, 2018

6.2 Modelling Goods Generation and Distribution for Sustainable Economic Development

Mr. Vice Chancellor, not only humans and vehicles flow along the transport network, but also goods and information flow. To revive the comatose transport system for sustainable development, it is also important to expand the frontier of knowledge in modelling goods distribution to predict the volume of freight that is generated, transported and distributed across the economic landscape of Nigeria. This ensures the country's efficient and effective transportation and distribution of economic goods. My earliest contribution in this area was my PhD research work in 2005 and studies conducted by Ojekunle and Oluwole (2016) and Ojekunle et al (2019), where we developed a rural market freight distribution model in South Western Nigeria. Only two of the five determinants

analysed are significant in modelling rural freight generation in the study area. The variables are Sales Catchment Area (SC) and Volume of Vehicular Traffic (VT). The Sales Catchment Area (SC) is significant at the 1% level. In comparison, Vehicular Traffic Volume (VT) is significant at 5%, accounting for 48% of the rural goods generation in the region. The model provides a basis for predicting the pattern of rural freight generation in South Western Nigeria.

Also, Ojekunle and Oluwole (2018) studied the rural goods generation and distribution pattern in South Western Nigeria (see figure 12). The study revealed that rural markets are the major centres of rural goods consolidation and channels of distribution of rural goods to the urban centres

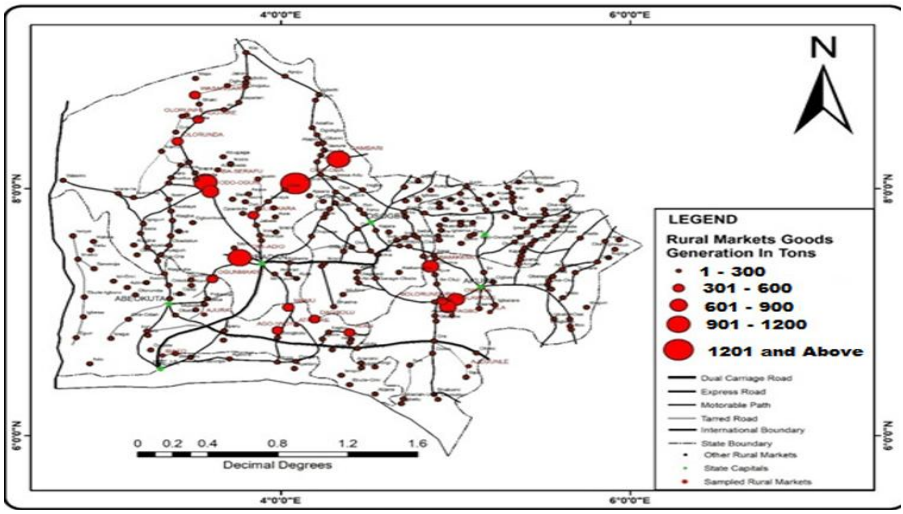

Figure 12: Volume of Rural Freight Generation by Sample Markets in South Western Nigeria

Source: Ojekunle *et al,* 2019

The findings further revealed that rural market goods are mainly demanded within the region; 73.6% of goods are attracted within

the region. Only about 26.4% of rural market goods are attracted by other states outside the region (see figure 13).

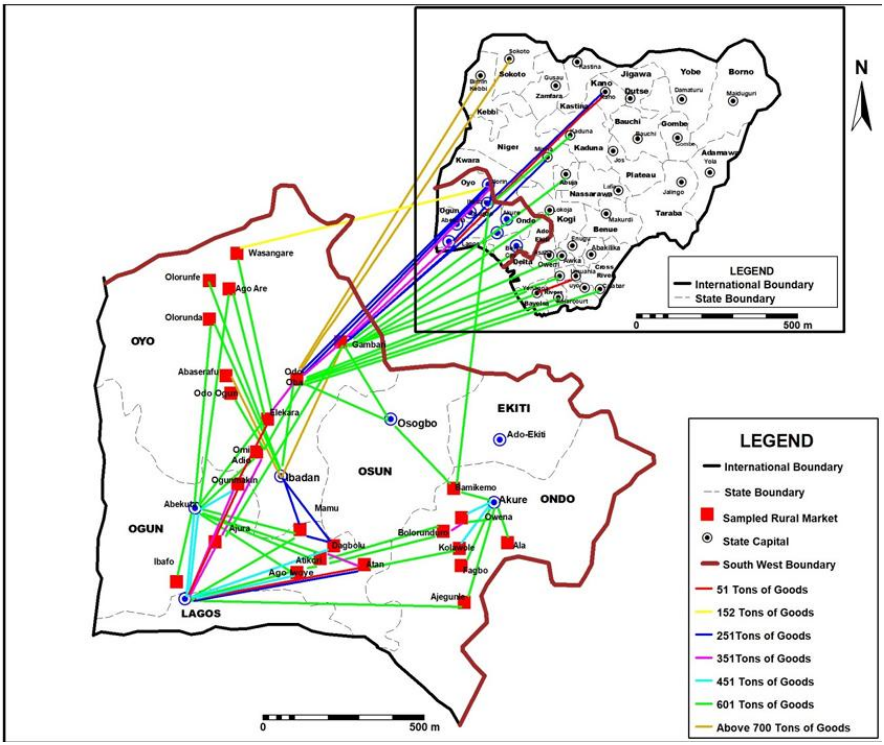

Figure 13: Freight Flow Pattern from rural markets in South Western Nigeria to different States in Nigeria
Source: Ojekunle and Oluwole, 2016

6.3 Public Transport Operations in Nigerian Cities

Mr. Vice Chancellor, sir, another important component of the blood of the economy is the operation of the transport modes. The inefficient and ineffective operation of transport modes will affect the entire traffic and result in the State of comatose. Reviving it will require a thorough understanding of its operations. This led to

a series of studies conducted by me singly or in collaboration with others related to transport operations in Nigerian cities. My pioneering work in this area was in 1995. I conducted a study on the operation and use of motorcycles as a complementary mode of public transportation in Agege, Lagos. The grant for the study was provided by the defunct Federal Urban Mass Transit Agency (FUMTA). The study examined motorcycles' commercial and operational characteristics, the level and pattern of usage, and their social and safety implications. The study's findings provided policy inputs for the old FUMTA (Ojekunle 1997). In another related study, Ojekunle (2008) also examined the operational characteristics of tricycles in Kano. The study revealed that tricycles served the dual purpose of generating employment and solving urban mobility problems in Kano. The study revealed that the operation was commercially viable but faced maintenance and regulation issues.

Mr Vice Chancellor, another critical area contributing to the revival of comatose blood and arteries of economic development, is making public transportation affordable and accessible to citizens. This prompted me to conduct another study (Ojekunle 2014), in which I tried to establish the significant determinants of fare structure of bus operation in Nigerian northern cities of Kano, Kaduna and Minna. The study analysed the fare structure of bus operation (see Tables 2 and 3). The study discovered that bus operation fares are charged mainly based on the zonal arrangement.

Table 2. Fare Structure of Bus Operation

Fare Structure of Bus Operation							
CITY		**DGF**	**ZF**	**FF**	**TOBF**	**JTBF**	**Total**
Kano	No of Resp.	0	45	5	0	0	50
	% of Total	0%	95%	5%	0%	0%	100%
Minna	No of Resp	0	11	3	0	0	14
	% of Total	0%	78.6%	21.4%	0%	0%	100%
Zaria	No of Resp.	0	15	0	0	0	15
	% of Total	0%	100%	0%	0%	0%	100%

Keys to table 1; DGF = distance graduated fare, ZF = Zonal fare, FF= Flat fare, TOBF = Time of operation-based Fare and JTBF = journey time-based fare

Source: Ojekunle, 2014

Table: 3 Average Fare Charged Per Passenger Per Kilometre in Naira and Us Dollar

City	Lowest Fare in naira (N)	Highest Fare in naira (N)	Average Fare in naira (N)	Average Fare in Us Dollar ($)
Kano	5.48	9.64	7.56	1.2 cents
Minna	12.08	21.34	16.71	9.4 cents
Zaria	2.29	8.43	5.36	3 cents

Source: Ojekunle, 2014

Ojekunle (2016) also studied the operational characteristics of public transportation in the Federal Capital Territory, Abuja, Nigeria. The study provides baseline information that contributed to the renewed effort of the FCT administration to improve the current service level of public transportation. The recommendations from the study were useful for regulations and the administration of bus operations in Abuja.

Again, Ojekunle *et al* (2018) examined the influence of commuters' socio-economic characteristics on bus service affordability and usage in Kaduna Metropolis. In that study, it was discovered that as

commuters' income increases, their bus service accessibility also increases. Trip frequency is also found to be negatively correlated to gender, which implies that women travel less frequently than men and travel shorter distances than men. The study further reveals that women rely more on bus services than men. The study therefore recommends that a public transportation system that is responsive to meeting the gender differentials in the transport needs of commuters should be introduced in Kaduna City.

Mr. Vice Chancellor, sir, the above is just a few of my research contributions to reviving the public transport system in Nigeria. Public traffic is part of the Nigerian economy's blood, which flows to ensure the effective functioning of the country's socio-economic system.

My Vice Chancellor, my research efforts were also not limited to passenger trips. I have also devoted much time and intellectual resources to examining freight traffic flow, distribution, and generation in rural and urban areas. A similar study was done in Kaduna State jointly with other researchers, where we tried to analyse the sphere of influence of agro-commodities rural markets in Kaduna State, Nigeria (Oluwole et al, 2016). In this particular study, we discovered that rural markets serve as the channel of distribution of agricultural products, and their areas of influence vary from one market to another. For example, the Makarfi market has the highest collection of dried pepper and onions, which are mainly transported to Port Harcourt, Akure, Ile-Ife and Enugu. Meanwhile, Giwa and Saminaka markets handle more of maise, rice, groundnut, millet, and sorghum. With respect to the sphere influence of the commodities within the country, Kano, Abuja, and

Lagos have the most outstanding proportionate share of 9.5%, 7.9% and 6.9%, respectively. On the international flow Jibiya (Niger), Chad and Cameroun has 1%, 0.5% and 0.2% proportionate share respectively. Again, Petroleum products are one of the freights being transported and distributed across the Nigerian economic landscape, which have so many adverse impacts on the environment. I have also made significant contributions to the perceived environmental impacts of refined petroleum products transportation and distribution in Nigeria (Oluwole and Ojekunle 2017). The studies in this area are meant to provide critical policy inputs on effectively managing the logistics and distribution of petroleum products across the country.

Mr Vice Chancellor, sir, I have discussed the blood; it is also important to discuss my research contributions on the arteries, which are a fixed transport infrastructure through which the traffic flows. I have put my intellectual energies on how to revive the comatose Nigerian transport infrastructure, one of them was how to explore the Public-Private Partnership (PPP) option as a sustainable platform for funding road transport infrastructure in Nigeria (Oluwole and Ojekunle 2017b). Another was done to assess the quality of road transport infrastructure in Minna metropolis in order to provide baseline information for sustainable maintenance management of the road transport network in Minna (Oluwole et al, 2017). In 2022, another study was conducted in Niger State in collaboration with other researchers, in the study we tried to develop a framework for funding road infrastructure maintenance management in Nigeria Ojekunle *et al*, 2024).

As a multimodal transport researcher, Mr. Vice Chancellor, sir, I have been involved in numerous studies in rail, air, inland and

maritime modes of transport for almost three (3) decades. My research on these modes of transport was also centred on understanding the nature, type, quality, and factors that influence traffic flow in different modes of transport in Nigeria. Some of my contributions also include the evaluation of the transport system performance, assessment of the service quality and policy impacts on the performance of the Nigerian transport system (Ojekunle 2014b; Ojekunle 2014c; Nwaogbe *et al*, 2020; Dere *et al*, 2021; Akorede *et al*, 2021; and Ojekunle, 2016)

7.0 CONSULTANCY ACTIVITIES

Mr. Vice Chancellor, sir, my contributions towards reviving the comatose arteries and blood of the Nigerian economy in consultancy services have been tremendous and highly fulfilling. I have been involved in over 30 different commissioned research projects between 1994 and 2024. I have contributed to the success story of the BRT System in Lagos. The baseline study that led to the development of the BRT System was conducted by a team of consultants, of which I was the coordinating project consultant. The rural access and mobility projects sponsored by the World Bank in Kaduna, Osun, Cross River, and South Western Nigeria between 2005-2011, I was the lead Consultant and coordinated the entire project. Also, in 2017 and 2018, I coordinated the execution of consultancy projects on Enhancing rural accessibility and Agro-commodity value chain financed by the World Bank in Adamawa and Akwa-Ibom States in Nigeria.

I coordinated the first Urban Transport Management System of Abuja in 2003. In 2002, I was involved in the development of the first Multimodal Infrastructure Master Plan for Nigeria in Conjunction with Alber Spear of Germany. Also, in 2013, during

the administration of President Goodluck Ebele Jonathan, I was among the members of the Transport Technical Working Group who produced the first Integrated Infrastructure Master Plan for Nigeria. This Group was inaugurated at the State House by the then President of Nigeria.

Mr. Vice Chancellor Sir, I have also engaged in numerous commissioned studies, including strategies for establishing a regulatory agency for road transport in Nigeria, National Transport Survey and Projection, and developing a policy framework for managing traffic in Nigerian cities.

At the state level, I have been involved in helping state governments in Nigeria solve their transportation problems, among them Kano, Gombe, and Rivers States.

At the international level, I have consulted the Government of the Republic of Gambia on building human capacity in its transport sector between 2019 and 2022. I have also served as a human resource consultant to many transport organisations in Nigeria, among them are the Nigerian Maritime Academy, Oron (MAN), Nigerian Civil Aviation Authority (NCAA), Nigerian Port Authority (NPA) and Nigerian Institute of Transport Technology (NITT), Zaria for the past 25 years. My experience in consulting business has helped me in teaching when I finally transferred my service to the Federal University of Technology, Minna, in February 2015.

8.0 TEACHING AND BUILDING MANPOWER

Reviving the comatose arteries and blood of the Nigerian economy requires competent and skilled manpower. My contributions to building manpower that manage and revive the comatose arteries

and blood of the Nigerian economy are very obvious. I started this business of building manpower as far back as 1996 in Nigerian Institute of Transport Technology, (NITT), and Ahmadu Bello University Zaria, Kaduna State where I was teaching Post Graduate Students in Transport courses among others, transportation planning, transport safety, transport and environment, Disaster Management in Transport and Logistics, Research Methodology in Transport, and Transport Project Planning and Evaluation. In addition, I have been involved in numerous training programs either as a main facilitator, coordinator and resource person to numerous transport and logistics organisations within and outside Nigeria. The impact of my contributions can be felt by numerous transport professionals whom I taught, now managing the transport system of Nigeria. Some of them have retired and some are still in active service in various transport organisations across the country and outside the country.

Apart from 10 Master's Students I produced before I joined the services of FUT Minna, within a period of 10 years, I have produced 18 Master's and four PhD student. I currently have 9 master's and 8 PhD students who are at various stages of completion of their studies. I have also mentored many young academics; providing leadership and helping them in building their careers.

9.0 NATIONAL ASSIGNMENTS AND COMMUNITY SERVICES

My passion for reviving comatose arteries and blood of the Nigerian economy is not limited to classrooms, research and commissioned studies, as well as conferences; I have been involved in many national and local assignments to ensure the revival of the

transport system. I had served in many national assignments at various levels including Member of Technical Committee that produced National Integrated Infrastructure Master Plan for Nigeria (NIIMP), a member of technical Group for transportation and logistics of Commonwealth Head of Government Meeting (CHOGM, 2003) held in Abuja in 2003 and Development of Road Transport Operation Manual for Nigeria, Federal Ministry of Transport Abuja, 2016 just to mention few.

9.1 Community Services

At the university level, I have served as chairperson or member of various committees, which are too numerous to mention. Notable among them is the First International Conference of School of Innovative Technology, FUT Minna, organised in 2024, where I served as the Chairman of the Local Organising Committee.

I have served in various capacities within the local communities where I have lived over the years, including a community chairman, a Deacon and an ordained Pastor at various times in different places. I am currently the Pastor of Rehoboth Baptist Church, Mandela, Road Minna, Niger State.

10.0 RECOMMENDED STRATEGIES FOR REVIVING THE COMATOSE ARTERIES AND BLOOD OF THE NIGERIAN ECONOMY.

My Vice Chancellor, the crux of this inaugural lecture is to proffer strategic solutions towards reviving the comatose arteries and blood of the Nigerian economy, which are transport infrastructure and traffic that flow within the transport system. These strategic solutions are based on the findings of numerous studies I have carried out, whether singly or jointly over the years.

1. Upgrading Road Infrastructure

As highlighted earlier, efficient transport infrastructure is essential for economic growth, trade, and mobility. Rehabilitation and expansion of transport infrastructure, such as building new highways and expanding and regularly maintaining existing ones, is the way to revive the comatose road transport infrastructure.

2. Public-Private Partnerships (PPPs): Due to dwindling national financial resources, private sector investment in road construction and management is inevitable. Restoring toll gates on interregional highways will provide a viable source of funding for road maintenance and rehabilitation. This will enable the country to provide the much-needed arteries through which Nigeria's economic blood can flow.

3. Deployment and Adoption of Smart Road Infrastructure Maintenance Management: Utilising sensors and installation of CCTV cameras and AI-driven monitoring systems to enhance road maintenance efficiency is very necessary. Various current and emerging technologies are being used to detect road conditions, potholes and other defects, which will alert maintenance agencies to where urgent maintenance action is required.

4. Traffic Control Technologies:

The same technologies can be used to manage traffic that constitutes the economy's blood. Deployment of smart traffic lights and real-time traffic monitoring systems is an inescapable route to follow. The introduction of an intelligent transport system (ITS) will enhance the management and control of traffic and transport

systems. Therefore, Nigeria needs to invest in deploying ITS to manage traffic flow within Nigeria's transport network.

5. Enhancing Public Transportation Systems

Developing a robust public transport system can reduce congestion and improve urban mobility. Introducing and implementing Mass Transit Solutions (MTS), especially in urban centres will help reduce congestion and provide a more environmentally friendly transport system. There is a need to expand Bus Rapid Transit (BRT) systems and develop modern railway networks in Nigeria's major cities to reduce urban mobility, economic and environmental costs.

6. Integration of Transport Modes: Inter-modal coordination of buses, railways, air transport and ferries for seamless movement is crucial in reviving Nigeria's economy's comatose arteries and blood. The lack of intermodal coordination of Nigeria's transport system is a cause for the comatose arteries and blood of the Nigerian economy. Reviving therefore will require that, at the stage of planning and development of transport infrastructure, a more comprehensive and all-inclusive approach to planning and development of the transport system should be adopted.

7. Subsidised Public Transport: One of the most viable solutions to inefficiencies, congestion, inadequate infrastructure, high costs, and poor management of the transport system is the introduction of **subsidised public transport**, which can significantly improve the efficiency and effectiveness of the transport sector. Implementing policies that make mass transit affordable for low-income earners

will enhance affordability and accessibility, accelerating economic growth and development.

8. **Strengthening Rail and Water Transport:** Diversifying transport options can alleviate pressure on the road network. The need to invest in the development of rail and inland water transport will help in no small measure to leverage the competitive advantages of various modes of transport for regional economic growth and development. The current overreliance on road mode limits the growth of interregional trade and distribution of goods and services at a more competitive cost across the Nigerian economic landscape. There is a need to modernise and expand rail networks for both passenger and freight transportation. Also, enhancing inland waterways and coastal transport to support alternative mobility solutions is necessary to revive the comatose arteries and blood of Nigeria's economy.

10. POLICY AND INSTITUTIONAL REFORMS

A well-structured regulatory environment is essential for sustainable transport improvements: A stronger Transport Policy that will prescribe implementation of stringent policies on urban planning, emissions control, and infrastructure maintenance. Such a policy should focus on ensuring transparency in transport project execution and funding, capacity building, and training and retraining of transport managers and engineers for efficient system administration.

11.0 CONCLUSION

This inaugural lecture has elucidated that the blood and arteries of development is transportation; if the blood fails to flow and the arteries are blocked, the economy will become comatose. The reasons for a comatose transport system in Nigeria have been highlighted, and my research efforts and contributions towards reviving the comatose transportation system were also discussed. The need to ensure that traffic flow is effective and efficient requires a multi-dimensional approach. Therefore, Nigeria's transport infrastructure and traffic system require a holistic and sustained intervention. By focusing on strategic investments, modern traffic management techniques, multimodal transport development, and policy reforms, the country can achieve a reliable and efficient transport system that supports economic growth and enhances the quality of life for its citizens.

PROFILE OF THE AUTHOR

Professor Joel Ademola Ojekunle was born on the 23rd of November ,1964 to the family of Late Mr. Akinwumi Alao Ojekunle and Mrs. Abigail Ojekunle of Gbogi's house, Ijeru, in Ogbomosho South Local Government Area of Oyo State, Nigeria. Prof Joel A. Ojekunle lost his father at his tender age of two years. He attended Saja Baptist Day School, Ogbomoso between 1971 and 1976. After his primary school education, he went to learn technical skills between 1976 and 1980. As destiny would have it, he was counselled by one of the close friends of his late father to return to school instead of being an automobile electrician.

This counsel led him to seek for admission into secondary school and got enrolled at Ori -Oke Community High School, Ogbomoso in 1980 and graduated in 1985. Prof Joel Ademola Ojekunle proceeded to Ogbomosho Grammar School where he did his Higher School Certificate (HSC) between 1985 and 1987. After this, he proceeded to University of Benin, Benin City in the then Bendel State in 1987 now Edo State. Prof. Joel Ojekunle graduated in the year 1990, did his National Youth Service Corps (NYSC) in Enugu City in the old Anambra State.

After the completion of his NYSC, he worked briefly in the private sector and later got admitted for his master degree at University of Ilorin in 1993 and graduated in 1995. Prof Joel Ojekunle started his working career from his NYSC year, where he served with Federal Road Safety Commission as a Research Officer. After the completion of his mater degree, he secured appointment with the Nigerian Institute of Transport Technology, Zaria, Kaduna State in 1995 as a Senior Research Officer. His desire to further his education led Prof. J.A. Ojekunle to enrol for his PhD programme at Department of Geography, University of Ilorin in the year 2000 and graduated in year 2006.

While he was at Nigerian Institute of Transport Technology (NITT), Zaria, Prof. Ojekunle held several positions and he rose through the rank and became a Deputy Director Transport Research and Consultancy of the Institute. At various times, while he was in NITT he served in various capacities including Deputy Director, Transport Technology Centre, Deputy Director Consultancy, Deputy Director, Transport Intelligence and Deputy Director of Training. Prof. Ojekunle has taught many courses at undergraduate and postgraduate levels while he was in NITT. Many of his students have held several top and strategic positions in different transport organisations in Nigeria. His university teaching experience began at Ahmadu Bello University in 1997, where he was engaged as a part-time lecturer in the department of Urban and Regional Planning where he taught all transport related courses in the department.

Between 2007 and 2008, due its outstanding contributions in transport training and research, Prof. Ojekunle got a sponsorship under the auspices of Swedish International Development Agency (SIDA), to undertake an advanced professional training programme in Urban Transport study. This training took him to many European cities to carry out case studies on best practices on urban transport and mobility management.

On the 1st February, 2015, Prof. Joel decided to transfer his service to the Federal University of Technology, Minna, as an Associate Professor in the defunct Department of Transport Management Technology, School of Entrepreneurship and Management Technology (SEMT). Since he joined the services of this great university, Prof Joel has served the University in various capacities, he was appointed as the Head of Department (HOD) Transport Management Technology from 2016/2017 to 2019/2020 sessions.

Also, as the pioneering HOD of Logistics and Transport Technology from 2020/2021 to 2022/2023 sessions. In July 2022, he was appointed as the Acting Director of Futmin Ventures. In January, 2023 he was appointed as the substantive Director of Futmin Ventures, the position he held till march 2025.

Prof. Ojekunle has been serving as a visiting Professor to African Aviation and Aerospace University, Abuja and Ladoke Akintola University of Technology, Ogbomoso. He has equally served as external examiner to many universities both in Nigeria and outside Nigeria. Among them are University Technical Malaysia, University of Lagos, Federal University of Technology, Akure, University of Ilorin, Ahmadu Bello University e.t.c.

In addition, Prof Joel A. Ojekunle has also served the University in various committees. He has attracted funds in collaboration with other researchers at different times to the University in forms of research grants. He has equally attracted over 160 million naira in total to the university between 2018-2025 through his consultancy services. Aside his services within the University, Prof Joel A. Ojekunle is a devout Christian; he is an ordained Minister of the Gospel. He is currently the Senior Pastor of Rehoboth Baptist Church, Mandella Road Minna, Niger State. He is happily married to Mrs. Ruth Ajibola Ojekunle, their union is blessed with 4 children, Toluwanimi, Olamide, Deborah and Adeola.

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My profound gratitude and thanksgiving go to the Almighty God, the Giver of Life, who has kept me alive to this day to stand before the great audience to present the inaugural lecture of the Federal University of Technology, Minna. The faithfulness of God demonstrates that a fatherless boy at a tender age of two, who never knew his father, could become the first Professor of Logistics and Transport Technology in Nigeria. To Him alone be all glory and praises. The journey was rough, but His mercies kept me going, His love towards me is immeasurable. There is always there in the thick and dark moments, and I return all glory to Him.

Again, I will forever be grateful to my aged mother, who took care of me right from the time we lost our father. As a widow, she played the role of mother and father throughout my growing up until I became an adult. Mother, I am indeed very grateful for all your sacrifices. I am also indebted to my siblings, who sacrificed for me to see that at least one of us went to school. I acknowledge the sacrifices of Mr. Timothy Oladipo Ojekunle, late Isaac Olayiwola Ojekunle and my dearly beloved brother, Job Olayinka Ojekunle. May God continue to bless you.

I also wish to express my appreciation to the Management of this great University through which my dream of being a professor was fulfilled. My appreciation goes first to the former Vice Chancellor, Prof. M. Akanji, who approved my appointment as an Associate Professor and the subsequent transfer of my service to FUT Minna. Also, I would like to thank the immediate past Vice Chancellor, Prof Abdullahi Bala, who facilitated my promotion to a professor during his tenure and appointed me to serve as Director of FUTMIN Ventures in an acting capacity. I equally want to thank the current Vice Chancellor, Prof. Adamu Faruk Kuta, for

appointing me as a substantive Director of FUTMIN Ventures from January 2023 to March 2025. I am indeed grateful to all of them.

I wish to acknowledge the indelible contributions of my teachers at all levels. Among them were my geography teacher in secondary school days, late Mr. Olaleye, who encouraged and helped me develop an interest in studying geography in my first degree despite the fact that I had the opportunity to study many other courses then. I will continue to be grateful to my other teachers, such as Mr. Olabisi and Mr. Adeyemi, and my school principal, Mrs. Yewande Imasogie. All of them are now late, may their souls rest in peace. I wish you thank my university teachers at my undergraduate level, the likes of Prof. Andrew G. Onokehoraye, Late Prof. G.E.D. Omuta, Prof. B.A.Chokor and Late Prof. Osirike. I cannot forget the outstanding contributions of Late Prof. Albert Ade Ogunsanya, my academic mentor, a father and my destiny helper. The story of my life cannot be complete without mentioning Late Prof. A.A. Ogunsanya, my academic supervisor for both my master's and PhD degrees at the University of Ilorin. I wish he were alive to witness this occasion. May your soul continue to rest in perfect peace! I also appreciate my seniors and my associates in the field of Logistics and Transport Management, Prof. Innocent Ogwude, Prof. Oyesiku, Prof. Badejo, Prof. Iyiola Oni, Prof. C.C. Ibe, Prof. A. Adesanya, Prof. J. Aworemi, Prof. S. Odewumi, Prof. K.T. Gbadamosi, Prof. A. Somuyiwa, to mention a few.

There are numerous people that God has used to help me along the journey of life, I cannot mention all, but I would like to recognise whom I call "my second mother", Mrs Otike Odibe, who supported me during my undergraduate days as a student in the University of Benin. Her care, assistance and support morally, financially and

spiritually are unforgettable. May God continue to keep her alive so that she can reap the fruit of her labour in Jesus' name.

Let me seize this opportunity to appreciate my former colleagues and those I also worked under while growing in my career at NITT, Zaria. Worthy of mentioning is Engr. P.I.J. Azagba, late Dr. Ibrahim Vandu Chikolo, Dr. A G. Sumaila, Dr. Aminu Yusuf. My other former colleagues are Dr. S.B. Akintayo, Dr. J.A. Odeleye, Dr. B.S. Farah (current Director General of NITT), Dr. Danjuma Sumaila (current Rector of Aviation College of Technology, Zaria) and many others that space and time will not permit me to mention. There are those God has allowed me to mentor: Dr. M. Olaomi, Dr. S.A. Oluseyi, Dr (Mrs) Suzanna Ibrahim Zego, and Dr. Engr. G. Ikenna, Dr. T.A. Segun, Mr. Aliu Tata of African Aviation and Aerospace University, Abuja. The list is endless! May God bless you all for allowing me to contribute to your lives in one way or another.

I want to thank my colleagues in the Department of Logistics and Transport Technology and the School of Innovative Technology. Among them is the Acting Dean of SIT, Prof. I. Dugwu, HOD, Entrepreneurship Department, Prof. M. Ijaiya, Prof. C.C. Adindu, Dr. J. Makinde, Dr. Musa, HOD Project Management Technology; Dr. (Mrs) Baba Dorathy, Dr. M. Ochepa and the Deputy Dean of SIT, Dr. Abdulwaheed. To my loving LTT Department Family, I wish to acknowledge my Head of Department (HOD) and my friend, Revd. A.O. Ajiboye and other younger colleagues: Dr. Oni Babatope Gabriel, Dr. A.S. Owoeye, Ms. Wokili Hauwa, Engr. Mutiat Yisa, Mrs Regina Anozie, Engr. Tayo Adebayo, the Departmental Secretary Mrs Salako, and the Office Assistant, Mallam Zakari. I also acknowledge the support of all my Ph.D.

students towards the success of this inaugural lecture; may God enrich you all more abundantly.

I wish to thank my Rehoboth Baptist Church family; your prayers and support are highly appreciated. To Engr. and Dr (Mrs) Abisoye and Prof and Dr. (Mrs) Afolabi, may God bless you for being there for me.

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Finally, I appreciate the members of the University Seminar and Colloquium Committee for making this lecture a reality. Also, I am grateful to all of you seated here today to witness this inaugural lecture.

Thank you all for honouring me with your presence may God bless you richly.

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