

TRANSPORT MORPHOLOGY: THE APOTHEOSIS OF LOGISTICS MANAGEMENT FOR NATIONAL DEVELOPMENT

ADEBAMBO OLAYINKA SOMUYIWA

B.Sc (Hons), M.Sc (Ogun), PGD (Rotterdam)
PhD (Ogun), FCILT, FinsTA, MCIS, MWCTRS.
Professor of Logistics and Transport Management



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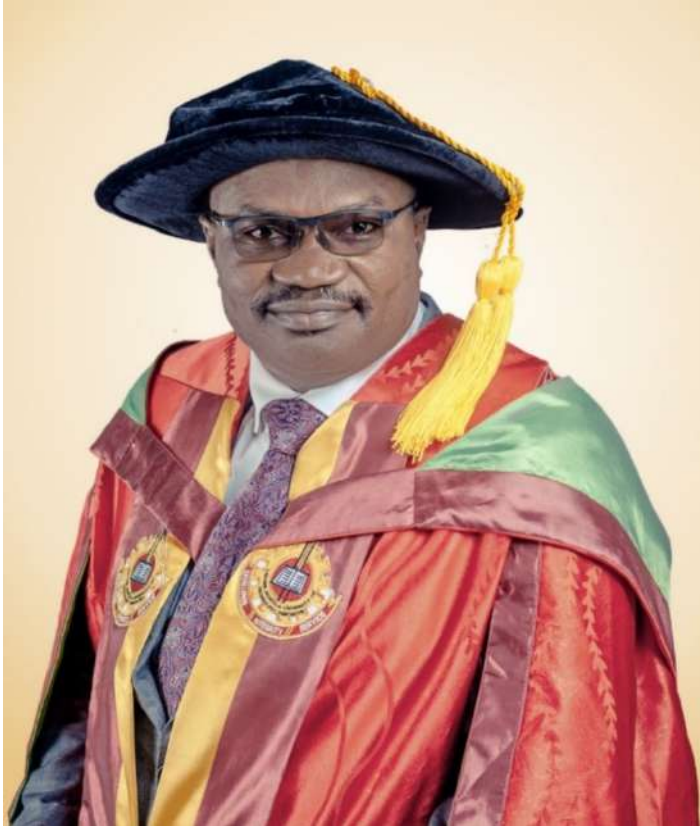
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PROFILE OF PROFESSOR ADEBAMBO OLAYINKA SOMUYIWA

Professor Adebambo Olayinka Somuyiwa was born some five and a half decades ago to the family of Late Aremu Olasupo Somuyiwa of Abeokuta progeny, and Chief (Mrs) A. O. Somuyiwa-Jarrett (nee Odusole) of Imosan-Ijebu origin, both in Ogun State, Nigeria. The young Bambo that can be said to be of **IJEGBA** origin had his elementary education at Saint Peter's Anglican Primary School, Imosan, Ijebu, Ogun State in the mid to late 70s. He started his secondary education at Ijebu Southern District Grammar School, Ala, Ijebu, and Ifesowapo Comprehensive High School, Imodi/Imosan, Ijebu, both in Ogun state, Nigeria in the 80s. He proceeded to Ogun State University (now Olabisi Onabanjo University), Ago-Iwoye where he earned a B.Sc. (Hons) degree in Geography and Regional Planning in 1994 (Second Class Upper Division), a M.Sc. degree in Transport Studies in 1997, and PhD in Transport Planning and Management in 2010. His quest to broaden his knowledge and international exposure took him through Netherlands Government Fellowship (NUFFIC) programme, to the prestigious College of Maritime Studies, now Netherlands Maritime University, Rotterdam, Netherlands for postgraduate studies in Port, Shipping and Transport Management in 2007.

Professor Somuyiwa began his academic career as a Teaching Assistant under the tutelage of then Dr. Kayode Oyesiku at the Department of Geography and Regional Planning and Centre for Transport Studies, Olabisi Onabanjo University in 1997, and was later employed as an Assistant Lecturer in the Department of Management Science (Transport Management Unit), Ladoke Akintola University of Technology, Ogbomoso in 2002, and rose through the ranks to become a professor in 2016. He was appointed a visiting professor at the Department of Marketing and Logistics, Namibia University of Science and Technology (NUST), Windhoek, Namibia (2018/2019).

Professor Bambo Somuyiwa has over 100 publications in frontlines journals, Books and proceedings of learned conferences, and

has successfully supervised 12 PhD Theses both within and outside Nigeria. About three (3) other PhD Theses are currently at various stages of completion. He has also supervised several Masters and Undergraduate research projects. In addition, he has consulted and still consults for more than 20 other students within and outside the department and the university. He has also served as an accredited external examiner at several universities including, but not limited to Federal University of Technology, Minna; University of Lagos, Akoka; Nigeria Maritime University, Okerenkoko, Warri; Ekiti State University, Ado-Ekiti; Redeemer University of Nigeria, Ede; University of the Witwatersrand, Johannesburg, South Africa; Strathmore University Business School, Kenya among others.

Professor Somuyiwa reviews and assesses regularly several national and international journals including: Journal of Social and Management Sciences, Olabisi Onabanjo University, Ago-Iwoye; Journal of Transport Studies, Olabisi Onabanjo University, Ago Iwoye; Journal of Business Management; Journal of Geography and Regional Planning; Journal of Management and Society; International Journal of Business Management and others.

At Ladoke Akintola University of Technology, Ogbomoso, he was a pioneer staff and pioneer Acting Head of Department of Transport Management, 2002 and 2010 to 2012 respectively, and later became substantive Head of Department of Transport from 2018 to 2021. He equally served as Deputy Dean of the Faculty of Management Sciences from 2016 to 2018. Within the university, he had served and still serves in various capacities including, Ag. Manager LAUTECH Mass Transit (2012-2014); Member, Strategic Planning Committee of the University (2012-2014); Member, Faculty Representative at the Board of the Post Graduate School (2015-2016); Representative of the Faculty of Management Sciences at Information Communication and Technology (ICT) Unit (2010-2014); Member, LAUTECH Master Plan, (Nov.2023 to date); Faculty of Management Sciences Board of Examiners (2010 to date); Member, Post Graduate Board, Faculty of

Management Sciences, LAUTECH, Ogbomoso (2010 to date); and Member, Faculty of Management Sciences Publications Committee (2010 to date). Outside the university, he serves as National Vice President, Ifesowapo Comprehensive High School Old Students Association Imodi/Imosan (2015 to date); Chairman, Professional and Development Committee of the Chartered Institute of Logistics and Transport, Nigeria (2014-2016); and Member National Council of the Chartered Institute of Logistics and Transport, Nigeria (2014-2016 and 2018-2023).

Professor Somuyiwa holds membership in several learned societies and research/professional institutes. He is a fellow of Chartered Institute of Logistics and Transport (FCILT). Indeed, he was the former Chairman of CILT, Nigeria, Ibadan Branch and once headed Professional Development Committee (PDC) of CILT, Nigeria and Education Champion representing CILT, Nigeria at the International Educational Standard Committee. He is equally a fellow, Institute of Transport Administration in Nigeria (FInsTA), Member of the most prestigious World Conference Transport Research Society (MWCTRS) among several others.

Professor Somuyiwa's professional and academic studies visits have taken him to European countries like Belgium, United Kingdom, France, Germany, Netherlands, Malta, North America (USA and Canada), Australia and Asia (Malaysia, India and China), as well as Middle East (UAE and Qatar).

Aside from being a pristine academic, Professor Bambo Somuyiwa loves to play soccer, and he is a dedicated fan of Gateway Football Club and Arsenal Football club in Nigeria National League and English Premier League, respectively. A devoted and loving family man, Professor Somuyiwa is happily married to a Chartered and Registered Town Planner, Mrs. Yetunde Somuyiwa, and the marriage is blessed with children.

Ag. Vice-Chancellor
Other Principal Officers of the University
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LAUTECH
Distinguished Colleagues and Friends from Sister Universities and
Institutions
Your Excellencies, Royal Majesties and Highnesses
My Lords, Spiritual and Temporal
Distinguished Guests
Gentlemen of the Fourth Estate
Great LADOKITES
Ladies and Gentlemen

PROLUSION

It is with doxological laudation to God, the Almighty Potentate that I stand before this plural concourse to present the 57th professorial inaugural lecture. The **fourth** from the Faculty of Management Sciences and the **second** from the Department of Transport Management. I consider my ascension to the acme position of Professor in spite of all odds, and my presentation of an inaugural lecture as the highest apogee of my academic peregrination.

The journey into the study of Spatial Phenomenon that later dovetailed into Transport and Logistics, started with my flair for Geography, that was planted by a Ghanaian class teacher in my secondary school, Mr. John Opokuafu, which was later cultured by Mr. Philip Adetola Shipe and nurtured by then Dr. Kayode Oyesiku who later supervised my three major degrees in Nigeria. Similarly, my foundation lecturers like late Prof. Samuel Onakomaiya, Late Dr. Cornelius Akanni, Mr. Yomi Oyesanwen and Dr. Dele Badejo all at one

stage or the other sharpened my curiosity regarding my interest in the subject of Geography.

Mr. Vice-Chancellor Sir, my interest in Spatial Phenomenon is both providence and hereditary, while the latter is about my result in Geography that I brought home when I was in secondary school, and my mother told me that Geography was my father's best subject and the former revolves around getting married to a geographer cum planner at a later stage in my life.

At a particular stage, there was the dilemma of going for Physical or Human Geography that subsumed Transportation. No doubt, Mr. Vice-Chancellor, Sir and distinguished guests, I was fascinated with physical geography especially Geomorphology that was handled by now Dr. Taiwo Ande (US-based). However, the pattern in which Dr. Kayode Oyesiku handled Settlement Studies, and Economic Geography made me opt for human geography especially the evolution of settlements, and internal city structure as well as interaction within and among cities, which the foundation relative to motion, movement and transportation had been laid by then Dr. Jegede in Spatial Organisation in Geography at 200 level. My inquisitiveness and quest for knowledge regarding man and environment as it relates to movement was later broadened in transportation courses that was introduced by then Dr. Dele Badejo and other erudite scholars in the course of my study. All these endeared me to go for my master's and PhD in Transport Planning and Management.

In the same vein, my curiosity and in a bid to understand transportation in general and particularly Maritime Transport with emphasis in Maritime Logistics, which is the hallmark of blue economy, made me to travel in 2006, with the aid of Netherlands Fellowship (NUFFIC) to the prestigious International Maritime/Transport Academy, later named Netherlands Maritime University, Rotterdam. Therein, I noticed how the morphology of the environment was capitalized upon by introducing modes of transportation in relation to available land uses. Netherlands is known to be proficient in water management, I equally observed in the course of my study in Netherlands, how the environment

dictates the mode of transportation, and subsequently provision of transport infrastructure which in turn birthed their transport structure (morphology). For instance, the high-level usage of inland water ways in Rotterdam which is a port city, is more pronounced than Amsterdam (the economic capital) or Hague (the administrative capital of the country). Transport morphology is concerned with how the functionality of transport is aided by the structure (Morphology) of the environment that equally dictates the transport attributes or elements by types, patterns, forms and others, with the aim of producing Transport and Logistics efficiency and service delivery through mobility for all and sundry. All these and many others will be discussed in the course of the lecture, especially moving from my background as a geographer cum planner to transport and logistics management.

The idea to specialize in logistics did not come out of the blue, but subtly and jocularly introduced to me by an elderly friend, but a colleague in postgraduate class; Mr. Sunday Williams (Baba Willy), who sarcastically referred to me as Logistics Manager of Oil Company at the Transport Studio of the Centre for Transport Studies of Ogun State University, now Olabisi Onabanjo University, Ago-Iwoye. Therein, I was working on my M.Sc. dissertation while using network analysis with broad-based map and manual calculation, to determine the connectivity and accessibility of retail outlets in the distribution of petroleum products in Ogun State. I immediately keyed into his **prophecy**, and simultaneously contemplated working in an oil company, which coincidentally was in vogue. Ironically, I never thought I could be a lecturer.

Mr. Vice-Chancellor, Sir, not that I did not have what it takes, because I graduated with a second class upper grade in my first degree and had the best result in my master's class, but I was not impressed with how lecturers were remunerated compared to their contemporaries in other sectors, which to a considerable extent affected their ways of lives. This, to be modest, ran riot to my mission and styles in life. However, contrary to my vision, my supervisor: Dr. Kayode Oyesiku

then, upon his arrival in 1997 from **Full Bright Fellowship** trip to America, and having noticed the academic potentials in me while under his tutelage at both undergraduate and postgraduate levels, invited and discussed with me regarding my place in academia. Although, I was not convinced, but tentatively agreed to work along with him, to make ends meet, since Oil Company appointment/employment remained a mirage. In the course of working with Dr. Oyesiku and going to classes to teach, attending seminars and other academic activities, I later had different perceptions that made me to create a niche for myself in the academic profession. My journey to Ladoke Akintola University of Technology (LAUTECH) can be attributed to one of the academic tours with Professor Kayode Oyesiku in 2002 when we visited a doyen in Transport Studies at National Institute of Social and Economic Research (NISER), Ibadan, Late Prof Kunle Adeniji, who equally was my maternal uncle and had taught me at postgraduate class in Ogun State University. In his office, there was a gentleman, Mr. Jonathan Adewoye from LAUTECH that came to see Late Prof. Adeniji regarding resource person that would assist to develop the newly established Transport Management Unit that was subsumed in Management Science, and my name was subsequently mentioned by these two experts in the field of transport. I later joined the service of LAUTECH as an Assistant Lecturer on June 20, 2002, and became the pioneer Acting Head of Department when the Department of Management Science metamorphosed into full-fledged faculty in 2010. I equally rose through the ranks to become the first Professor in Logistics and Transport Management in LAUTECH, and arguably the first in South-western Nigeria in 2016, and the rest is history as they say.

Going forward, my sojourn and consequent interactions with places and countries in the world gave me the impetus to have the conviction that, with transport, everything will fall in place. This made me ruminate over the title of this inaugural lecture which I wanted to be deeply rooted in my faith as well as capture various elements of my area of proficiency that should be brought to fore, “**Transport and Logistics**”. Hence, initially thought of *Matt 6:33*, “***But seek ye first the***

kingdom of God, and his righteousness; and all other things shall be added unto you”, which I adopted to be “*Seek and fix ye the kingdom of transport and logistics management, all other things will fall in place*”. Again, I was mindful of the number of words in the proposed title therein, because I had wanted the title to be concise and straightforward, with a high degree of comprehensibility to all and sundry. Against this background, I finally decided on the very title of **Transport Morphology: The Apotheosis of Logistics Management for National Development**.

Mr. Vice-Chancellor sir, distinguished guests, I did not only study transport management, but walked, dined and wine the discipline. To be humanly modest, I have travelled with virtually all modes of transport in my academic years. I have experienced turbulence in the air and on water, escaped fatal accidents on road and guided from Rail mishaps. In other words, in the past two and the half decades(as part-time and full-time),I have been studiously involved in research in virtually all key areas of transport, thereby contributing to knowledge in the field of transport studies with emphasis on Logistics/Supply Chain Management. Therein, I have been able to apply, modify and refine theories, concepts and models to tackle transportation problems and Logistics/Supply Chain Management issues. These research are tailored along cardinal areas in Logistics/Supply Chain Management such as **planning** (Systems, Design (Facility/Network), Optimisation and Cost). Similarly, in **operations** (information, order process, procurement, outsourcing, strategies, reversed/green logistics, logistics decisions, transportation, warehousing and inventory and other operational activities). Above all, in the area of **logistics infrastructure** that are equally related to other modes of transportation and their relative attributes, are all discussed in this lecture in a sequential manner. Many inaugural lectures had been delivered that centred on what needs to be done and not how it should be done. This lecture, however, is on how or in what manner things should be done to activate national development.

1.0 Introduction: Overview of Transport

That Transport as postulated and asserted by various scholars in the field and allied disciplines, to be of theoretical interest and economic prominence need not be debatable. For instance, Transport of any mode has enhanced spatial interaction, induced locational changes and integrated various regional spaces, in other words, adequate transportation system, such as highways, rural roads, airports, seaports and railways will boost the exchange of goods and services at all levels. Suffice it to stress that an efficient transportation is a prerequisite for efficient production and commercial activity. According to Oyesiku (2021), he noted that at the international level up to the United Nations General Assembly, transport has featured predominantly in the transformation of the world, as recognised in various documents on the agenda for sustainable Development. For instance, at least three (3) out of seventeen (17) United Nations Sustainable Development Goals emphasised the critical importance for humanity of effective and efficient transportation systems in supporting development. The United Nations (UN) highlighted the need to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (Goal 5); build resilient infrastructure, promote inclusive and sustainable industrialization and foster Innovation(Goal 9); and make cities and human settlements inclusive, safe, resilient and sustainable (Goal 11) (United Nation, 2015).

Mr. Vice-Chancellor Sir, the UN further expatiates that in achieving these goals, mobility is essential and that by 2030 efforts must be made to device and implement policies to promote sustainable tourism that creates jobs and promote local culture and products, develop quality, reliable, sustainable and resilient infrastructure including regional and trans-border infrastructure to support economic development and human wellbeing, with a focus on affordable and equitable access to all, and provide access to safe, affordable, accessible and sustainable transport system for all including road safety, notable by expanding public transport with special attention to the need of those in

vulnerable situations such as women, children, persons with disabilities and older persons . Oyesiku (2021), citing Taaffe and Gauthier (1973); USDOT (1990), Oyesiku (2002) and Ogunsanya (2002).

2.0 Impact of transport on socio-economic development

Transport, Logistics and Supply Chain Management are activities that are being practiced daily. The importance of transport can and may not be felt until the absence of it. Imaginary experience of total collapse of the world's economy through coronavirus pandemic showcased the importance of mobility. Transport generates billions of workers across the globe and more are joining on daily basis. From motorbike riders to tryclist, taxi, haulers, pilot, seafarers, freight forwarders, government agencies and fuel attendants. Apart from this, ancillary services directly or indirectly related to transport like spare part sellers, vehicle repairers, vulcanizers, construction workers, among others numerous to mention. Countries' economy is being measured by their Gross Domestic Product (GDP).Oyesiku *et al*, (2016 and 2016a). It is however regrettable that Nigeria or indeed Africa is yet to optimize her potential in export earnings in spite of avalanche of resources available in the region. Economy can be and should be controlled with transport as its operating cost can cause inflation or reverse of it. For instance, increase in price of fuel can lead to increase in cost of all factors of production which is just one major component in transport operating costs Oyesiku *et al*, (2019) and Oyesiku (2021). The economic importance of transportation is depicted in figure 1.

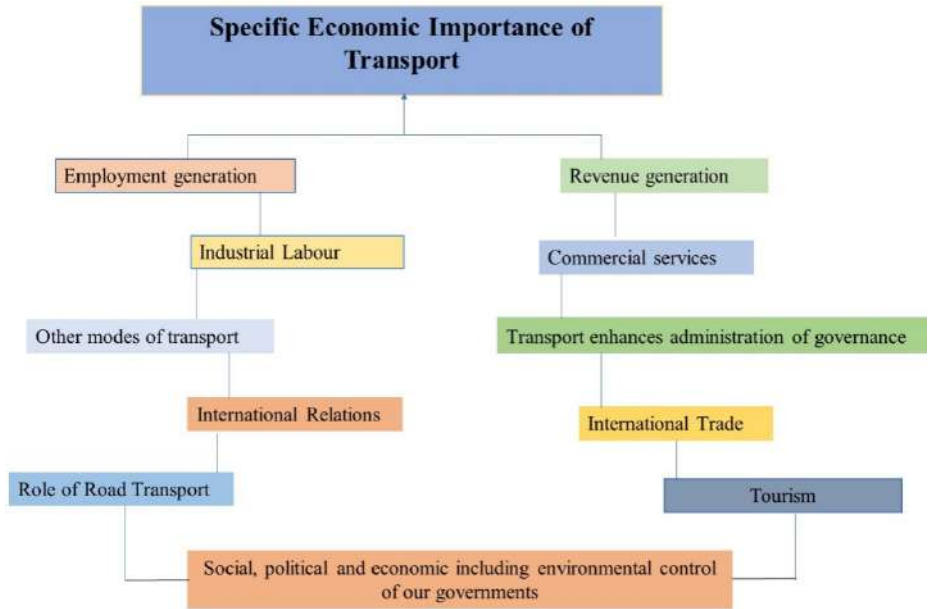


Figure 1: Specific Economic Importance of Transport

Source: Author's Construct (2024)

3.0 Modes of Transportation

Transport is complex as it is intertwined with all aspect of distribution, consumption, production, marketing, administration and even disposition of waste (Somuyiwa and Adepoju, 2020). Overtime, Nigeria's transport system, consisting of various sub systems – road, rail, air, water and pipeline has changed and it is still changing in order to meet the fundamental requirement of mobility and accessibility, as it were, in the space economy.

Hence, globally, we have classification of modes into **Air transportation, Road transportation highways, Inland waterways, Maritime systems, Overland transport, Rail transport, Transit, Telferage (Cables and similar facilities operational on electricity supply)**, as shown in see table 1

Table 1: Transportation Systems and their Associated Modes

Overland Transport	Air Transport	Seaborne/Maritime Transport	Telferage/Telpherage Transport
<p>* Road Transport</p> <ul style="list-style-type: none"> - Walking - Bicycle - Motorcycle - Tricycle - Pedicab - Highway - Taxicab - Bus - Bus Rapid Transit - Trolleybus - Road Passenger Terminal <p>* Rail Transport</p> <ul style="list-style-type: none"> - Light Rail - Monorail - Tram/Street Car or street train - Heavy Rail Transit - * Metro - Commuter Rail - Automated guide way Transit - Rail Terminals - Pipeline - Liquid - Petroleum Products (Diesel, Petrol etc) - Gaseous (Natural gas) 	<ul style="list-style-type: none"> - Airways - Airports - Airfields/Landing fields - Airplanes 	<ul style="list-style-type: none"> - Inland waterways - Seaports - Ferries - Ferry terminus - Jetties - Ferry cruise (Cruise liner) - Vessels - Landings 	<ul style="list-style-type: none"> - Cable Car

Source: Oyesiku, (2021)

4.0 Challenges of Transport System

Evidence abound and documented in the literature that there are challenges of transport system, irrespective of the modes of travel, despite its importance to the national development. These challenges include, but not limited to inadequate transport infrastructure, inadequate regulatory public transport framework, environmental hazard, limited alternatives to vehicular transportation and others that all centres on chronic traffic congestion as revealed in fig 2 (Sumaila,2013). In furtherance to this, solutions to ameliorate these respective modal challenges had one time or the other been proffered by scholars, practitioners and researchers. For instance, maritime adopted concessioning in tandem with policy goal, and with a view to enhancing operational efficiency, improving security measures, increasing revenue profile, construction of terminal roads and others as shown in figure 2a. Regrettably therefore, the sector still performs below optimal. Perhaps the inefficiency of this concessioning and other strategies for other modes of travel had been majorly attributed to improper or poor direction of policy growth to pivotal elements of transport scenario, and/or the policy (statement or draft) does not align with **SMART principles: Specificity, Measurability, Achievability, Relevance and Time lag** (Somuyiwa and Ogundele, 2015, Adepoju *et al*, 2023, Adeyemi, 2023 and Somuyiwa, *et al*. 2023a)

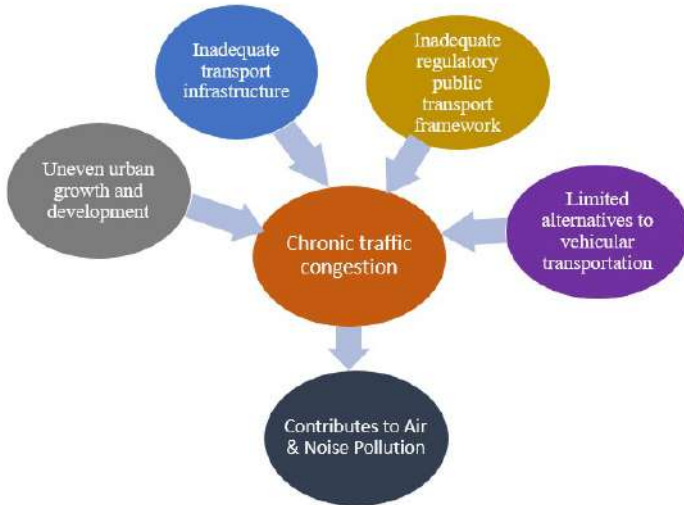


Figure 2: Summary of Challenges of Urban Transport System
 Source: Adapted and modified from Sumaila (2013)

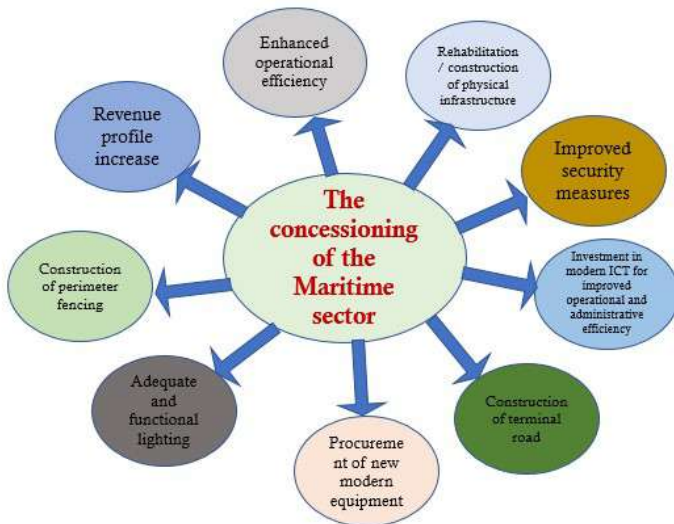


Figure 2a: Importance of Maritime Concessioning
 Source: Author’s construct (2024)

Similarly, and still on the challenges, figures 3a and 3b clearly revealed issues and problems in Nigeria Transport System, irrespective of the mode of travel, which revolves around infrastructure, vehicle, operations and policy/planning. Surprisingly policy drives other important elements; infrastructure, vehicle, operations and planning. Suffice it to stress that, without or absence of integrated, articulated, definite, and unambiguous transport policy, the results are institutional conflicts, erratic planning or poor planning implementation, coupled with poor operations and management due to inadequate skills. These issues often snowball into hiccup/friction in transport scenario and ultimately inefficient transport system. The import of this is that the Nigeria Transport system has not been able to harness, explore and exploit the morphology of the environment to potentiate various modes to transport and ultimately develop transport systems in harmonious manner for effective and efficient logistics management. For instance, in the south south geo-political zone of the country, water transport should be well developed to complement other modes of transport, especially to have access to Islands and creeks in order to enhance interaction and foster considerable level of development. Ironically, most jetties for commercial inland water ways operations are unregulated, unplanned, unsecured and lack basic safety infrastructure.

Mr. Vice-Chancellor sir, permit me to share a personal experience I had in the late 2023, precisely December 4, 2023, during National Universities Commission (NUC) accreditation exercise, to two of the Islands in Gbaramatu Kingdom: Okerenkoko and Kurutie, which are campuses for Nigeria Maritime University, in Warri south Local Government area of Delta State. The voyage was not pleasant on a return trip to Warri, when the boat developed mechanical fault and abruptly broke down at the high sea, amidst high waves due to the time of the day. I was uncomfortable at first, but my trip to Rotterdam made travelling by water very cushy, because substantial parts of the programme in Rotterdam, were spent on water, hence got accustomed to travelling by water. However, that day was something else, the situation

can be likened to when death was staring at one's face, Therein, I knew the literary meaning of the idiom **“difference between the devil and deep blue sea”** I immediately confessed my sins and braced up the courage that **Que sera, sera**. If not for the University management that responded to our call for **May Day** by collaborating with few of the commercial local boats operators to convey us to Warri, there wouldn't have been this opportunity to deliver this lecture and share the ugly incidence. However, the manner we changed from the faulty boat to the rescued boat further compounded the matter, because it was extremely unethical, unprofessional, scary and risky, which I was reliably informed that was their style and pattern. The implication of this scenario is that there was and still no adequate planning for unforeseen circumstance(s), coast guide was not and still not available or obscured, as well as other sound operational mechanism were and still conspicuously missing.

It is sad to observe that inland water transport is been operated like road based mode of transportation, where it is unregulated, uncontrolled and characterized with multiple agencies or numerous operators. This goes to say that mishaps are not peculiar to water transport only. It happens in virtually all modes of travel. Surprisingly, this negates Transport Policy Initiatives, Policy Thrust and Goal of various transport statement (1965), Policy (1993), Draft policy (2003) and (2008) with all hinged on adequacy, efficiency, affordability, safety, environmental friendliness and market driven transport system as shown in figures 4 (Sumaila, 2013 and Onokala and Olajide (2019). This is further discussed in the course of this lecture.

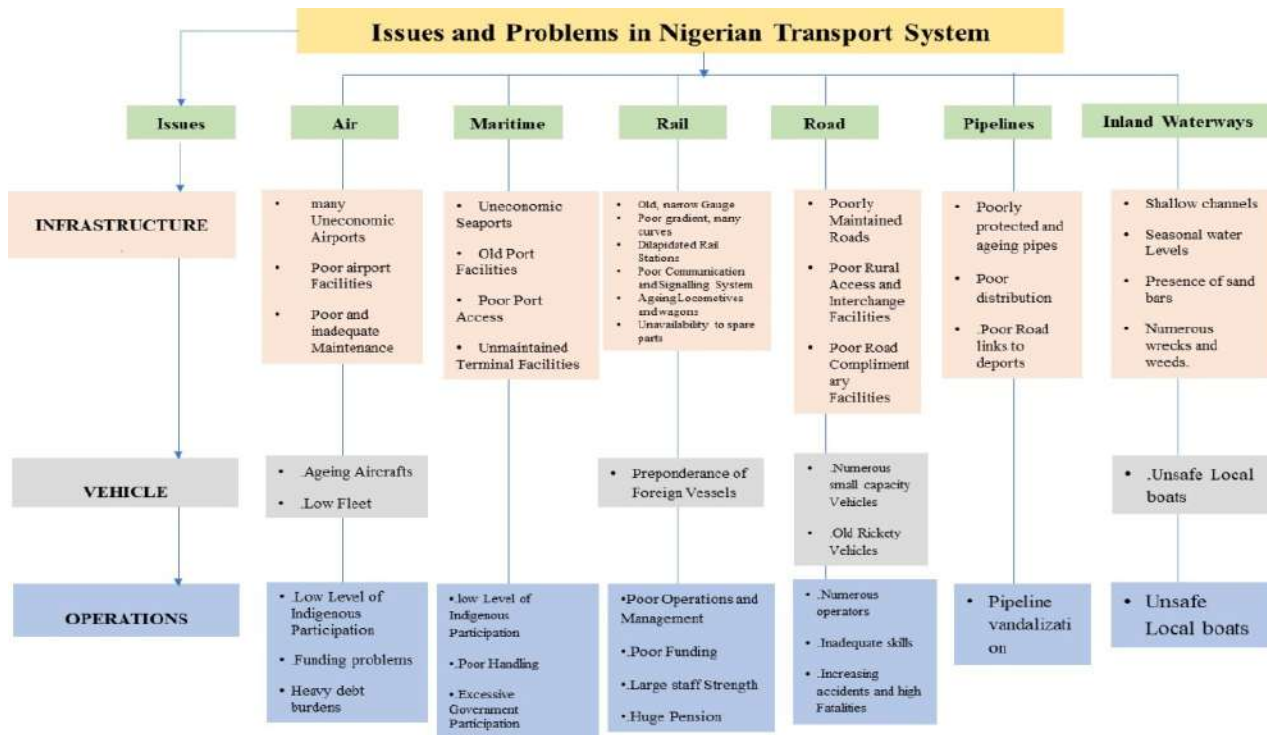


Figure 3a: Issues and Problems in Nigerian Transport System
Sources: Sumaila, 2013; Onokala and Olajide (2019)

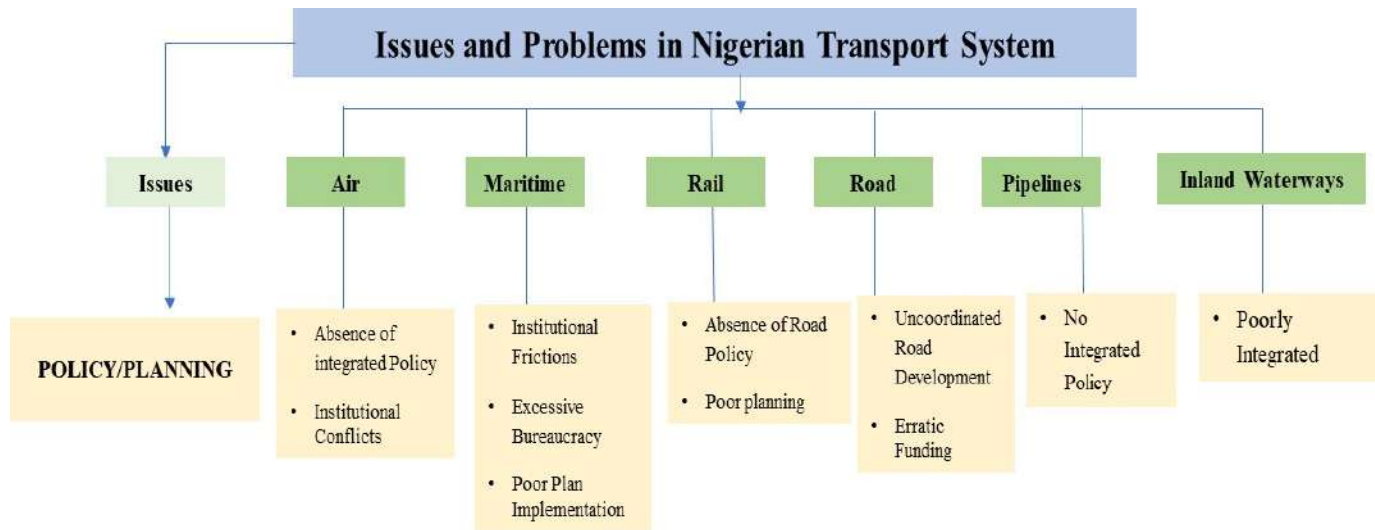


Figure 3b: Issues and Problems in Nigerian Transport System

Sources: Sumaila, (2013); Onokala and Olajide (2019)

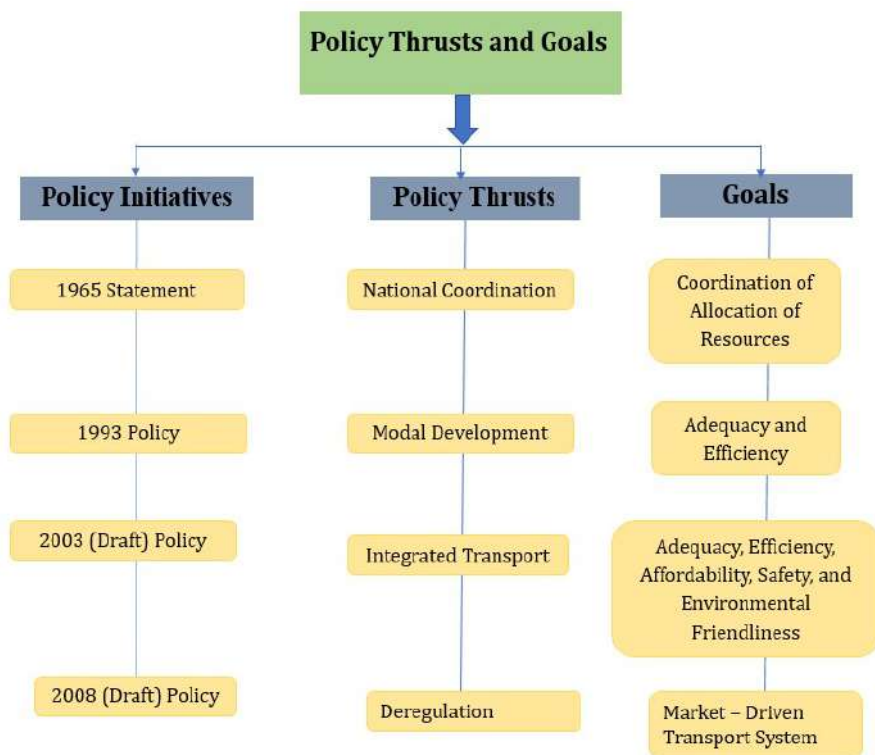


Figure 4: Policy Thrusts and Goal of Transport Systems
 Sources: Sumaila, (2013) and Onokala and Olajide (2019)

5.0 Landscapes and the Theme of Urban Morphology

Mr. Vice-Chancellor Sir, morphology as a scientific concept in the field of geography, originated in natural sciences at the end of the 19th century. However, Carl Sauer’s 1925 epochal essay “Morphology of Landscapes” moved the research topic toward social scientific and cultural studies. The philosophical presupposition of Urban Morphology as documented by researchers and scholars is well acknowledged and need not be repeated. Similarly, the processes of morphology as established by Amen and Wiederhold, (1964); Whitehand, (1987);

Conzen, (1960) and Colby (1933) are known and need not be over flogged. However, the interest of this lecture lies in the evolution and interaction of Morphology and Transportation as opined by Colby (1933).

In generic terms, a morphogenic landscape can be applied to urban forms or transport flows. In a spatial perspective, there is an area available for transportation inserted between buildings and designated land use with a strong dynamic component of land utilization. Streets and highways are the lifeblood of movement patterns and control the roadmap of those who depend on accessibility; pedestrians, cars, public transport, and trucks moving goods.

Transport innovations have a strong relation to corresponding changes in urban morphology, where the prevailing trend in the transport system has had an indisputable impact on urban form during the 20th century. The impact of cars and trucks gave rise to an expansion of the urban environment along larger highways with commuter development to suburban housing. But in general, transport innovations have shorter life cycles compared with the duration of urban form over time (Giannopoulos and Curdes 1992). In the same generic way, that urban landscapes can be divided into tripartite divisions that include transport landscapes, which can be equally divided into three parts: transport infrastructure, vehicle technology, and transport management.

1. **Transport infrastructure.** Streets, highways, depots, buildings of suppliers and recipients of goods; the objects and phenomena that make up the transport system.
2. **Vehicle technology.** The vehicle industry goes through stages of innovation that affect the development of vehicle types, engine construction, and fuel sources, where mode of transport affects urban form.
3. **Transport management.** Centripetal and centrifugal forces, interrelated in distance and time in a transport network, are derived from business models and transport planning decisions that have a positive or negative effect on transport efficiency.

In this lecture the discussion will be confined to the first and third parts; Transport infrastructure and Transport management. It does not mean that second aspect is irrelevant, but in this case, it is constant, while Transport infrastructure and Transport management will vary because of changes to the morphological characteristics of places.

6.0 Transport Morphology Defined

The term “morphology” is used in geography to express variances in spatial objects or phenomena by visualizing their development over time. Transport morphology presumes that movement of goods relates to urban form, which defines what a specific flow of transport can produce over a specified period. Production in this regard is expressed in different units of transportation measurements, such as ton-kilometer, Vehicle Kilometers of Travel (VKT), vehicle fill rate or in terms of supply chain management; punctuality and predefined time windows for delivery. These factors set constraints on the amount of goods being moved within a given transport system, where the constructed environment indicates the morphological framework in which to operate. The morphological connection between urban form and a transport flow can be measured and visualized by goods transported in an intelligent street network between nodes of suppliers and recipients.

7.0 Conceptual Underpinning and Clarification: Logistics, Supply Chain and Transportation.

Mr. Vice Chancellor sir, it is important to note that the need for mobility is basic to the socio-economic and political development of society, the dimension of cost minimization is equally central to overcoming the friction of distance. Somuyiwa (2010), quoting Larson *et al*, (2007) noted that the movement of goods and services at minimal cost involves more than just transportation and has drawn the attention of Geographers, Economists and Engineers. It is at this point of coverage that Logistics and Supply Chain Management are considered part of

transportation, becoming a key focus of Economics, Marketing, Business Administration and Operations Research. Transport, Logistics and Supply Chain Management are used interchangeably, Logistics appeared in the literature almost a century before Supply Chain Management, however, there is a slight difference between them (see figure 5).

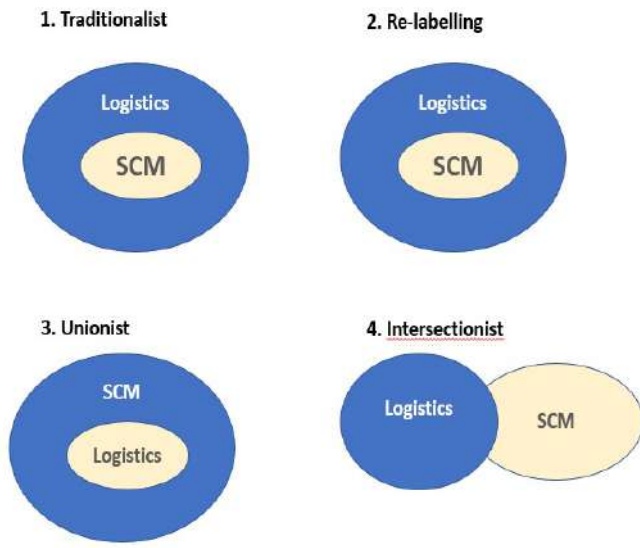


Figure 5: Relationship between Logistics and Supply Chain Management

Source: Larson, *et al*, (2007)

7.1 The Concept of Logistics

The term logistics can be traced back to the Greek word **logistikos**, which denotes a high level of proficiency or expertise in the field of calculation (BTRE, 2001). The area of logistics is crucial in enhancing the value of products through the strategic management of their availability and timely delivery to the intended destination. The concept of place utility in logistics refers to the availability of a product

at the desired location, while time utility relates to the timely delivery of the product. The objective of logistics can be expressed as maximizing customer utility or perceived value. The fundamental objective is to optimize the disparity between the perceived value and accurate costs (Somuyiwa, 2010, 2010a, 2010b and Gbadegesin, 2023).

Subsequently, the primary goal of logistics management is to enhance the efficiency of service delivery to clients, through the effective management of intricate trade-offs among customer service, transportation, warehousing, and inventory. Supply chain management is an approach that expands the principles of logistics management to include both customers and suppliers, overcoming geographical and organizational boundaries, with a primary objective of meeting customer satisfaction. Moreover, individuals employ different terminologies to refer to these patterns of actions and structures. Harper (2004) observes that the process is emphasized when referring to operations, while marketing is referred to as a logistics channel. Additionally, the value chain is used to highlight the value added, and the demand chain is employed to examine how customer demands are met.

Numerous definitions of a supply chain can be found in the supply chain management literature, though with minor differences in formulation. According to Silver, *et al*, (2016), the process involves a network of suppliers, manufacturers, distributors, retailers, and customers, wherein materials are transferred from suppliers to customers through a bidirectional flow of information. In recent times, the concept of supply chain management has attracted considerable attention on a global scale. This can be attributed, in part, to the recognition that effective supply chain management can enhance an organization's performance and increase its potential to attain a competitive edge (Gligor & Holcomb, 2013).

The concepts of physical distribution management however, is a subset of logistics, indeed, it belongs to the Outbound/Downstream leg of Logistics. It gained popularity during the 1970s and 1980s as noted by Somuyiwa (2010). During the latter part of the 1980s, the concept of

logistics management underwent a transformation. Subsequently, towards the end of the 20th century, it further developed into supply chain management.

7.2 Components of Logistics System

Mr. Vice-Chancellor Sir, the logistics system as shown in Figure 6, offering a comprehensive view of its structure and components. The three components of this system are logistics services, information systems, and infrastructure/resources, which are deeply interconnected. The interpretation of the interaction among the three main components within the logistics system is ascertained as follows. Logistics services facilitate the transportation of materials and goods from the initial stage of production to the end consumer, while also managing the disposal of associated waste and reverse flows. The scope of activities includes both internal processes carried out by service users, like storage or inventory management within a manufacturing facility, as well as the functions performed by third-party service providers (Lambert and Stock, 2001).

Logistics services encompass both tangible operations like transportation and storage, as well as intangible operations like supply chain planning, contractor selection, and freight negotiation. The majority of logistics services activities are bi-directional. Information systems include the modeling and management of decision-making processes, with a particular emphasis on the crucial aspects of tracking and tracing. The provision of crucial information and advisory services throughout the various stages of the logistics service-target station interface is facilitated. Infrastructure encompasses a range of components such as personnel, monetary assets, packaging materials, storage facilities, transportation and communication systems. This is further revealed in the components of logistics as indicated in figure 6 and the cost ratio of logistics components in figure 7.

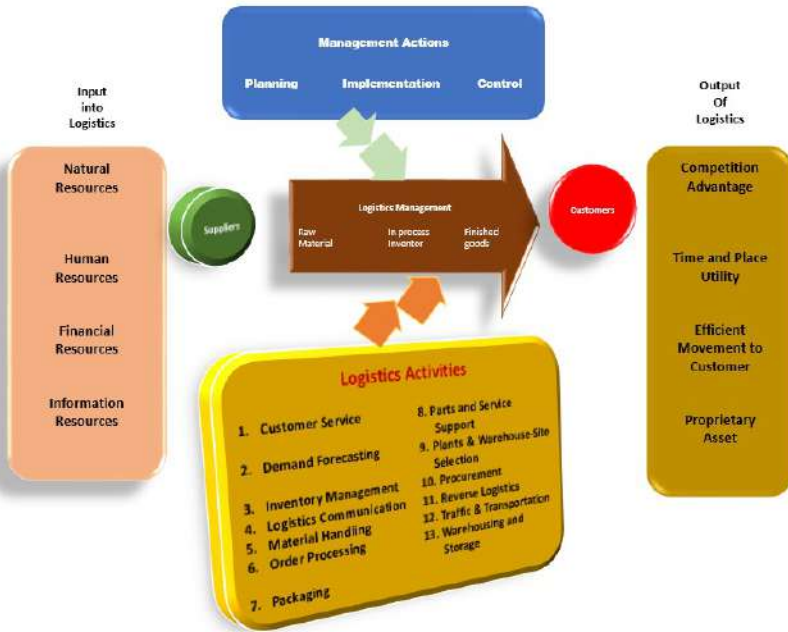


Figure 6: Components of Logistics Management

Source: Adapted from Somuyiwa (2010) and Christopher (2016)

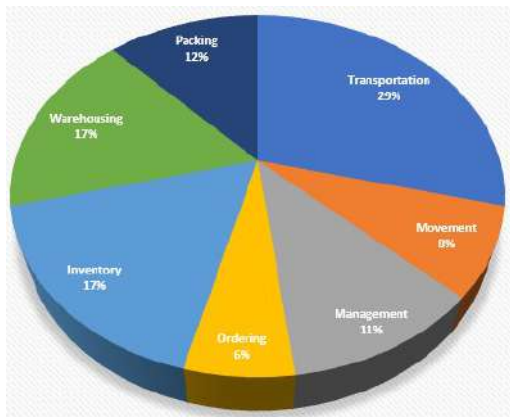


Figure 7: Cost Ratio of Logistics Components

Sources: Somuyiwa 2010 and Oyesiku 2021

7.3 Logistics and Supply Chain Management

A good transport system in logistics activities could provide better logistics efficiency, reduce operational cost, and promote service quality and other forms of logistics operations. Hence, Somuyiwa (2005 and 2009) further noted that the improvement of transportation systems needs the effort from both public and private sectors. A well-operated logistics system could increase both the competitiveness of the government and enterprises.

The standard statement of the objectives of the supply function is that it should obtain the *right materials* (meeting quality requirements), in the *right quantity*, for delivery at the *right time* and *right place (Time and Place Value added)*, from the *right source* (a supplier who is reliable and will meet its commitments in a timely fashion), with the *right service* (both before and after the sale), and at the *right price* in the short and long term. This infers a positive and linear relationship between Transportation and Logistics as observed by Somuyiwa, (2009a and 2009b). However, Somuyiwa and Adewoye (2010), opined that the theoretical basis of the information has not been fully understood within the context of logistics system in Nigeria, such that it will give a pointer to how those inherent costs could be managed or saved, as well as enhanced supplier-customer collaborative relationships. It is in the light of this that the authors attempted to give theoretical considerations, through descriptive methodological approach, on how those basic objectives of logistics can be achieved and its ultimate goal can be realized.

8.0 Logistics, Supply Chain Management (SCM) and Cost Functions

Supply chain incorporates logistics functions, because attempts to overcome the problem of complex trade-offs among various logistics activities resulted in the creation of SCM, (Ruijgrok, 2001). These logistics functions are transportation, inventories, warehousing and information flow. While the first three are used to design distribution

network, the inclusion of the fourth function made all to be responsible for logistics cost. (Chopra and Meindl, 2012).

Mr. Vice-Chancellor Sir, considerable works have been done in the area of transportation in supply chain management; with all tend towards transportation cost reduction, without consideration on the overall total cost and profitability of the companies. All these have led to the introduction of strategic alliances, such as third and fourth party logistics (Milligan, 2000; Lambert and Stock. 2001; Factor, 2001;). In furtherance to all these, Somuyiwa, *et al*, (2015c and 2016) noted that Transport costs arise from carrying inventory in-transit, from numerous operations connected with frequent and small deliveries resulted from just-in- time deliveries. Low costs, short time of transport and accepted level of risk are crucial for logistics managers. Focus on customer needs' satisfaction, order fulfilment, short transit time, on-time delivery; gives transport costs a new dimension.

However, Braddy (2000), opined that significant supply chain cost reductions from a transportation perspective can be obtained, but that one needs to look further than network optimization and rate reductions with carriers. He further asserted that these methods involve network, lane and node decision-making that form an integral part of transport management solution which include transport planning, Vehicle Routing and Scheduling (VRS), delivery execution and shipment tracking and performance management. Somuyiwa (2014) noted that the importance of VRS in logistics activities of manufacturing companies are well appreciated and emphasis should be on how this salient issue in Transportation can be more practicable among manufacturing companies. The paper revealed that the parameters in the constrained model are significant, consequently explained a large part of the variation in the data set. The study recommends that companies should adopt scientific information management system which will in turn propel VRS as well as lay emphasis on IT investment in attempt to cut cost, simultaneously maintaining customers' service.

The purpose of total logistics cost (figure 8) analysis is to identify the change in costs brought about by these decisions. Cost must therefore be viewed in incremental terms – the change in total logistics cost caused by the change to the system. Thus the addition of an extra warehouse to the distribution network will bring about cost changes in transport, inventory and information investment (Christopher, 1998). The author further ascertained that logistics costs can account for such a large proportion of total costs in the supply chain management, it is critical that they be carefully managed. However, it is not always the case that the true costs of logistics are fully understood. For instance, traditional approaches to accounting based upon full-cost allocation can be misleading and dangerous. Somuyiwa (2010f), evaluated the importance of transportation cost in overall logistics cost management, with a view to establishing the role of transport in the supply chain, while focusing on inherent costs incurred in transport cost, and how cost reduction can be established, simultaneously maintaining the correct levels of customer service, using Transportation costs components- Labour cost; Owned vehicle cost; Rented/Hired vehicle cost and others.

Data analyses were done using a software application that incorporated Cobb-Douglas production function, which was packaged and tailor-made for the study. It was revealed that there were significant relationships among components of transportation cost. Hence, the study recommends that emphasis should be placed on number of owned vehicles, labour cost, rented/hired vehicle cost and distance over which goods are carried so that cost reduction can be achieved, simultaneously maintaining customers' service.

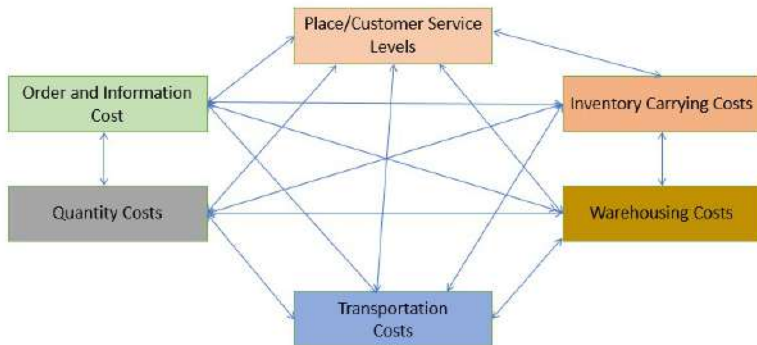


Figure 8: The Total Cost Model

Sources: Adapted from Lambert and Stock (2001) and Somuyiwa, 2010.

In literature, there are various attempts to create a comprehensive approach to the total logistics cost concept. For instance, Somuyiwa and Oyesiku (2010) sought to analyse the performance of collaborative information sharing cost in outbound logistics with emphasis on Order and Information costs, with a view to minimizing cost and enhance efficient ordering and information services in manufacturing companies in Nigeria. The study recommends that companies should adopt management information system that enhances information technology investment as well as training and maintenance of these information devices

9.0 Transport and Logistics as Business Model

Urban freight is strongly interrelated with many other aspects of the urban system: urban passenger system, land use, regional development, socio-economic environment, employment, etc. Thus, it is necessary, when considering urban freight planning, to devote some effort towards understanding its integration within urban mobility planning. As pointed out by Macário and Caiado (2005), acting on urban logistics domains implies intervening in different aspects of urban mobility management, particularly institutional, regulatory, social,

infrastructural and technological, therefore requiring the joint and coordinated action of the different stakeholders in the urban logistics arena. Understanding the relationships between the agents of the logistics activities and the major elements that influence the urban logistics is very important to know the functioning of the urban system and define the most feasible “logistics business”.

Another important structure of business model can reflect the characteristics itemized below:

- Determination of whom the organization create value
- Factors that can add value by the organisation to customer-efficiency, customisation, reliability, price, cost reduction and accessibility.
- The channel of reaching the customers-Direct sales, wholesales and the informal channels.
- Personal relationships
- Technology and Innovation, while the cost associated with Logistics Business Models includes, Fixed costs, Variable costs and sunk costs

Furthermore, Somuyiwa (2010c) opined that for efficient urban transportation, the demand for freight transport is an inevitable issue within the context of socio-economic and political relationship of the society. For instance, it enhances city logistics relatively to land use, traffic and delivery characteristics. Of all these salient issues, traffic is considered the most important because it subsumes congestions, especially along major corridors of the city. It is in the light of this that this paper investigated the effects of logistical and supply chain trends on the level and nature of demand for freight transport in Lagos. The study to a considerable manner, identified some areas of attention within the metropolitan Lagos. Industrial areas that needed to be planned relatively to design, operations and maintenance of roads for instance, such that ultimate objectives of logistics can be achieved. In other words, there is need for provision of affordable opportunity for innovative

solutions to be developed for improving the quality of life in urban areas as claimed by Taniguchi *et al*, (2001). This can only be done through several advance techniques such as Geographic Information System (GIS), Global Positioning System (GPS), logistics knowledge, Intelligent Transport System (ITS) and modelling to optimize the city environment, such that it assists in reducing both transport cost and negative environmental impact. The study further recommended that city logistics should be enhanced so that the city will be economically buoyant, socially vibrant and environmentally friendly.

10.0 Areas of considerations to excel in business logistics

There were indications from extant research that ‘business partnerships were successful because they were implemented through strategic alliances between the companies and the municipality (Somuyiwa and Somuyiwa 2010 and Somuyiwa and Somuyiwa 2010a). Of all the logistics activities of production, distribution and supporting activities, distribution is the strongest followed by production and lastly supporting service (TURBLOG, 2011). Somuyiwa and Adebayo (2014) noted that there is positive association between Supply Chain Responsiveness (SCR), Supply Chain Management (SCM) practices and Competitive Advantage. The study further provides suitable recommendation on the scope for improvement based on current levels of various predominant SCM practices and SCR criteria that directly impact competitive advantage of a firm, so as to make the organizations more competitive. Similarly, the study showed that companies have been effective in using reverse logistics to reduce total logistics cost, improve customer satisfaction, enhance competitive advantage and in minimizing the environmental impact of returns as well as recovery of materials for re-use.

Moreover, some business concepts were only effectively implemented because they were sustained by public administration policies, which provided availability of warehouse spaces or accessibilities and, in some cases, financial incentives, resulting in

partnerships with the municipality or other government administrations. In order to meet the municipality environmental requirements and restrictions, and also looking forward towards improving the service performance, some companies developed joint ventures to develop these new services.

In the case of product characteristics that include size, weight, holding conditions, special conditions, fragility and perishability. Vehicle Routing and Scheduling problems (VRP) involve an optimisation process of assigning customers to trucks and determining the visiting order of customers and routes of vehicles. Somuyiwa (2010f), examined the potentials of economies of scale in downstream logistics of manufacturing companies of a developing economy, with a view to harnessing various cost components of this outbound logistics, such that customer service could be enhanced and competitive advantage could be achieved. Findings revealed economies of scale and scope among input of outbound logistics resources indicating that logistics costs are characterized by joint distribution process, consequently concluded that resources management should be based on multiproduct distribution theory, and that explicit recognition of the economic interactions among resources should be incorporated in any regulatory process, through various categories of logistics service providers that must be encouraged in the country. The study then recommended that group distribution by logistics service providers, as well as outsourcing be encouraged. This is in order to promote economies of scale which reduces cost, enhances fleet management, as well as customers' satisfaction.

11.0 Information Technology in City/Urban Logistics

Recent developments in the field of Intelligent Transportation Systems (ITS) can facilitate the implementation of many City Logistics initiatives. Currently, advanced telecommunication systems provide powerful tools for efficiently operating vehicle fleets. Sophisticated logistics systems can now be developed by integrating Global

Positioning Systems (GPS) and Geographical Information Systems (GIS) in conjunction with application software. Therefore, ITS based City Logistics has become more realistic in many industrialized countries. In recent times, there has been a great deal of interest in the use of Global Positioning Systems (GPS) for freight demand modeling. Among other benefits, these data are: very accurate, increasingly common as the number of companies using GPS devices is increasing, and free as they are the byproduct of vehicle tracking and navigation systems. However, a fundamental limitation that has not been overcome is that GPS cannot collect key data that traditional surveys provide (e.g., commodity type, shipment size, trip purpose). For these reasons, GPS has had a limited role in freight demand modeling. However, the usefulness of these technologies cannot be over emphasized. For example, origin, destination and routing information received from GPS receivers can be used to validate and improve the information provided by truck drivers in manually completed travel diaries. Also, combining GPS truck trip information with Geographic Information System land use data can yield useful information on truck activity characteristics at trip ends (Beagan *et al*, 2007 and Somuyiwa *et al*, 2011).

12.0 City Logistics and Its Challenges

Mr. Vice-Chancellor Sir, city/urban logistics is a concept trying to integrate the existing resources to solve the difficulties caused by the impacts of increasing population and vehicle ownerships in the urban area. Almost all Nigerians, especially in the cities do think of movement as it becomes important in their daily movement decisions. Traffic congestion was said to be one of the worldwide urban problems, which can lengthen journey time, increase energy consumption, aggravate environmental pollution and result in traffic accident. Differently put, in spite of all the technical ability to solve such problems well in place, the modern cities are confronted by a transportation problem more complex than ever before and despite all the methods of movement, the problem in cities is how to move (Fadare, *et al* 2015 and Somuyiwa, 2015).

Nigerian transportation problems as discussed earlier range from technical, human and environmental need not be over flogged. However, Somuyiwa (2010a) further enumerated the effects of logistics on environment. The author opined that, distribution of goods impairs local air quality, generates noise and vibration, causes accidents and makes a significant contribution to global warming. Going forward, different countries especially developed economy had used various approaches to solve city/urban logistics problems, however, there is no one policy that can meet all the demands and requirements of urban freight transport, since each policy has different effects on freight operations, coupled with the fact that the area of city logistics is ever growing and there could never be a perfect ontology to describe it, the tools and frameworks need to be continuously developed and improved. Regardless, there may be need to however work on stringent measures to reduce congestion in Lagos metropolis and other commercial cities in the country, as it will not only reduce the stress but also the costs of business operations will remarkably decrease and ultimately may be used to improve business performance in these cities (Somuyiwa, 2010c).

Somuyiwa, (2008) equally observed that, most of the transport negative externalities that characterized most developing economy due to their unplanned, uncoordinated and unmanaged transport scenarios require attention of Regional and Transport economists, Planners and other allied disciplines. It is in the light of this, that the study examined a psychosocial analysis of this phenomenon in developing economy like Nigeria. The study recommended among others, that design management should enhance the sanitary and aesthetic condition of the transport infrastructure, accompanied with compensation for those living within particular radii from the road in any neighborhood.

12.1 Solutions for City Logistics Problems

There have been considerable studies regarding solutions to city logistics challenges that considered peculiarities of environment. For

instance, Somuyiwa, (2009; 2010a) and Somuyiwa, *et al*, (2021) all suggested that effective logistics models that devoid restriction, but based on door-to-door delivery services and equally involves public transport and non-pollutant vehicles (bicycles) for their daily delivery should be encouraged. Hence, the solution includes but not limited to innovations on Business-to-Consumer approaches, such as distribution directly from the producer to the final consumer. This is further depicted in figure 9

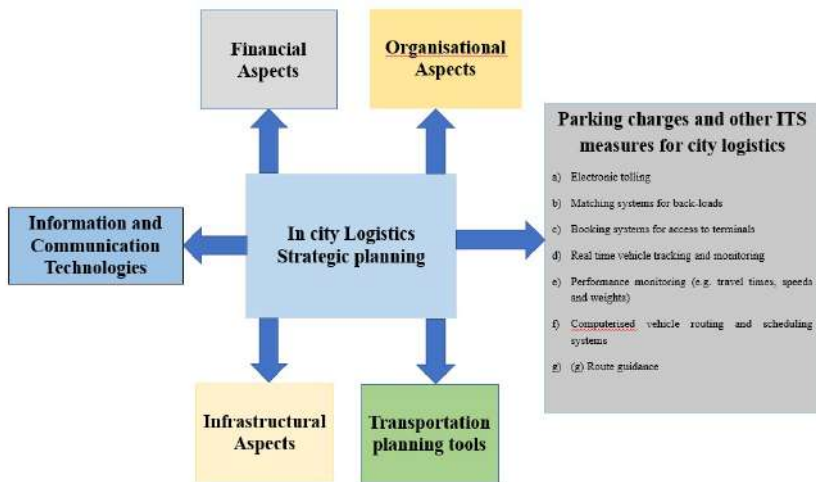


Figure 9: City Logistics Strategic Planning Model

Sources: Sources: Ville *et al* (2010) and Gonzalez-Feliu (2012)

One of the cardinal objectives of transport and logistics is safety within the context of safe arrival of goods and services. This is important when in the case of Nigeria scenario the main mode of travel and distribution of goods and services is road, hence there is need for safety management. The issue of safety in transportation in general and precisely in road transport, being most dominant mode of transportation in Nigeria, is of theoretical interest and economic importance, especially when safety is viewed within the context of hallmark of transport policy that subsumes **Adequacy, Safety, Security, Accessibility,**

Convenience, Mobility and others (Somuyiwa *et al*, 2016a and Somuyiwa *et al*, 2023).

Somuyiwa, *et al*, (2016a) noted that in furtherance to the cardinal objectives of safety in Transportation that are predominantly Preventive and Corrective, as well as in line with human factor as prevalent among the causes, hence issues in Transport Safety and Traffic Management revolve around this dominant factors and how it can be addressed are within the purview of **5Es of Safety Driving** that are highlighted thus as shown in figure 10

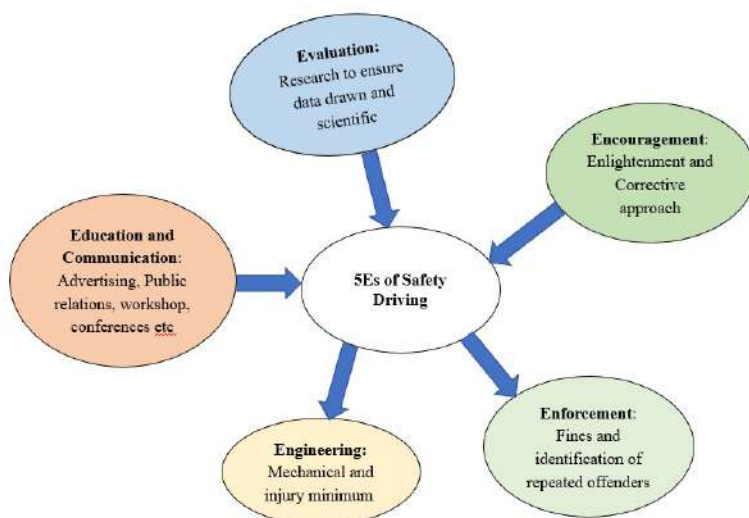


Figure 10: 5Es of Safety Driving

Source: Adapted from Somuyiwa *et al*, (2016a)

Mr. Vice Chancellor sir and distinguished guests, it must be stated that the issue of road safety sustenance can never be carried out by a set of people or safety officials alone, it must be seen as a collective responsibility. When a set of people in society are well informed about safety rules and regulations; and others know little or nothing about

safety rules, the resultant effects will still be unsafe roads. Unfortunately, many drivers and road users on our roads cannot decipher road markings, road signs and signals not to talk of reading highway codes, traffic acts and traffic regulations. Perhaps this can be attributed to level of illiteracy especially among Nigerian commercial drivers. All the same, considerable level of safety can be achieved through 4Ps.

- i. **Planning- Psalm 11:3. *.If the foundation be destroyed, what can the righteous do? (5Ps of Planning) Proper Planning Prevents Poor performance,*** planning within elements of transport, effective planning within the context of attributes of transport: vehicle, motive power, network/routes, terminals, parking lots, traffic and street light, pedestrian walkways, bus priorities routes, other road furniture, vulnerability, and other road users, adequate and accurate data base and ICT (Intelligent Transport System). Sequel to this, there is need to develop properly planned infrastructure and upgrading existing ones to acceptable standards; improving traffic management to reduce congestion and delays and their associated emissions; Strengthening measures to minimize the number of vehicles in operation, particularly aging fleets, and other transport equipment with high emissions; Integrating transport infrastructure planning into land use planning to ensure sustainable road safety and traffic management, which meets accessibility, mobility and environment needs and other requirements; involving all stakeholders, including local authorities, ministries, and representatives of residents in the neighborhoods of prospective locations of facilities to have their say about land use and vehicle planning and routing (Badejo, 2014 and Somuyiwa, 2020).
- ii. **Politics-** Political will to implement accordingly.
- iii. **Policy-** This should be futuristic, logically implementable/feasible, socially acceptable and holistic in nature. Hence, appropriate

institutional frameworks should be put in place and separate regulatory and operational functions for road safety and Traffic Management; strengthen existing and establish new entities responsible for the planning, regulating and implementing activities that will support the development of sustainable road transport safety.

- iv. **Public Service-** Although the number of workers in Nigerian Transport enterprises and agencies are relatively high, the availability of skilled and certified personnel are limited in most transport Organizations/Agencies. In addition to lack of adequate skilled human resource, institutions are also lacking, that have appropriate powers and technical capacity to formulate, plan, and manage infrastructure development and services and to regulate and enforce policies and regulations within the framework of **5Cs: Capability, Capacity, Competence, Character and Courage.** 5Cs of efficient public service. Efficient institutions having appropriate mandates and staffed with highly motivated and skilled human resources are key elements in the development of a safe, secure, affordable and environmentally sound transport system (Somuyiwa and Adepoju, 2020).

13.0 City Logistics and Infrastructural Development

The term “infrastructure” is used in various scientific and non-scientific fields. It originates from Latin, and namely the word “infra” is understood as grounds or fundamentals while “structure” means distribution of elements of certain undefined setup. By the definition that is given in the Cambridge Advance Learner’s Dictionary and Thesaurus (2016) “infrastructure” is the basic systems and services, such as transport and power supplies, that a country or organization uses in order to work effectively. Infrastructure is a component of the territorial structure of national economy, which is formed by the transport, communications, trade, energy and water management system, as well as dwellings, schools, objects of health protection, culture, sports and other

objects for care of inhabitants and their arrangement in any territory (Seetanah, 2006 and Saeima, 2010). Russian researches Rudneva and Kudryavtsev believe that transport infrastructure is a regional transport infrastructure capital, i.e. “a certain type of capital demonstrating the specific social character, manifested in transport infrastructure ability to bring to the region the benefits with not only economic, but also with socio-cultural characteristics, and conditioning the synergistic effect of its implementation” (Rudneva and Kudryavtsev, 2013). Infrastructure is a complex field with so many different components under it; but all of them can be categorized into two main types of infrastructures. They are the hard and the soft infrastructure. *Hard Infrastructure* refers to the physical network that keeps an industrialized nation smoothly functional. Among the components that are classified under the hard infrastructure are the capital assets like the utilities, transport vehicles, telecommunication systems, roads, highways, railways, subways, traffic lights and street lights, dams, walls and culverts, drainage systems, the airports and bus terminals, and bridges, among others (Oyesiku *et al*, 2013).

The *soft infrastructure*, on the other hand, is the framework required to keep and maintain the different institutions. This can also include both the physical and the non-physical assets. Examples of physical assets are the buildings that house the network and the equipment used to maintain the institution. For non-physical assets, this includes the software and programs, the governing rules and regulations, the financial system, and the organizational structure. In essence, the soft infrastructure embodies the system of delivery of services to the people.

The logistics infrastructure on the other hand comprises: warehousing infrastructure, including: buildings and premises, storage yards, warehouse equipment; the so-called handling infrastructure, including: internal transport, auxiliary equipment for commodity handling; transport infrastructure; transport packaging infrastructure: marked with a code, not marked with a code; IT infrastructure, including hardware, software, orga-technical means, and equipment for

telecommunication purposes (Lall, 2001). Furthermore, transport infrastructure within this concept as a part of logistics infrastructure means the following: air transport, rail transport, road transport, water and inland transport, pipelines and others as identified earlier in Table 1

Transport infrastructure is one of the most important parts of economic infrastructure (Lall 2001). Transport activity, a key component of economic development and human welfare, is increasing around the world as economies grow. Transportation is a reflection of economic activity, in as much as products must be moved to markets. A good transport network is important in sustaining economic success in modern economies (Eddington, 2006).

Lakshmanan, (2007) and OECD (2013) stipulated that logistics infrastructure is an essential component in international competitiveness that mostly depends on the government for provision and maintenance. It is expected to promote enhanced development in countries based on networking effects (Melo, *et al*, 2013) and the efficiency of the intermodal system. Transportation plays a crucial role in the flow of goods, which can be affected by low quality infrastructure, reducing the country's opportunities to integrate into the world economy (Button & Yuan, 2013; Hoekman and Nicita, 2010). Transport infrastructure is a critical ingredient in economic development at all levels of income. It supports personal well-being and economic growth. Transport infrastructure plays a role as a capital input into production and wealth generation. Transport infrastructure is a necessary input into the production of transport services which, in turn, are necessary to allow for the market exchange of final goods and inputs (including labour) – or for broader welfare benefits (e.g., travel time savings).

13.1 Transport Infrastructure Development Performance

Mr. Vice Chancellor sir, and distinguished guests, as noted earlier, the logistics infrastructure concept includes transportation and communication infrastructure. Information and communication technology (ICT) is a critical component of a contemporary logistics

system. Computerized systems for handling flows of goods bring more options for worldwide intermodal transportation networks within the reach of customers (UNCTAD, 2008). They also create incentives to competition, which reduces the costs of transportation (UNCTAD, 2008). The low quality of ports, airports, roads, railroads, warehousing and ICTs appears to constrain the logistics performance in the developing countries (The World Bank, 2010). A functional logistics system is essential in enabling trade. The economic openness of a region is typically measured as a share of the total trade volume relative to GDP (Oladosu, 2023)

The infrastructure is one of the key factors in assessing the functionality of a logistics system (see Figure 11). An evaluation model based on an in-depth understanding of the situation of the logistics system in a geographical area is used as the measurement basis for four logistics-related dimensions. According to Banomyong, *et al.*, (2008) A regional or a macro logistics system is formed from four elements which are: human resources and capabilities; public and private sector logistics and transport service providers; provincial and national institutions, policies and rules; and the transport and communications infrastructure. These logistics-related dimensions are inter-linked to determine the overall capability of the macro logistics system within the scope of the geographical area under scrutiny in terms of system capability and performance (Banomyong, *et al.*, 2008). The logistics and transport literature traditionally claim a direct link between regional economic growth and an increase in freight transport (Kóvacks and Spens, 2006; Bansister and Berechman, 2001). As logistics and transportation are the consequences of trade, the link between freight transport and economic growth seems to exist also in the global scale, as it can be noticed from the IMF statistics measuring the world GDP and trade.

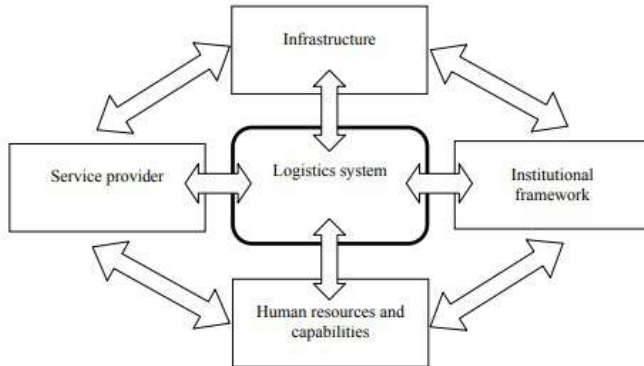


Figure 11: Macro logistics system

Source: Adapted from Banomyong, *et al*, (2008) and Oladosu, (2023)

Furthermore, the changes in the world GDP can be noticed to be reflecting the world trade with an emphasis on components of infrastructure. Figure 12 illustrates the relation of the transport infrastructure, investments and economic development, represented by GDP-related measures. To keep the figure as simple as possible and to sharpen the focus of this lecture, the possible mediators of those relations are not shown. The solid arrows indicate the impact direction of our present interest, and the dotted arrows indicate the feedback.

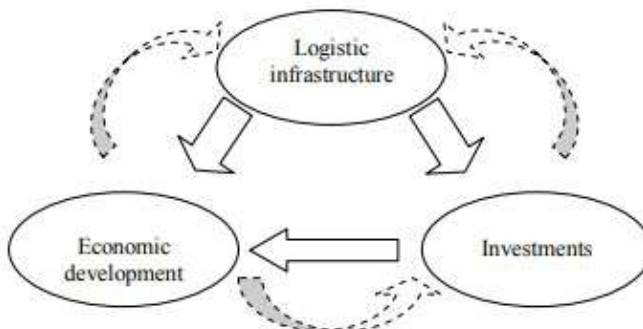


Figure 12: Logistics infrastructure in relation to economic development

Source: Vilkoet *al*,(2010) and Oludosu, (2023)

Logistics infrastructure is one of the most important elements of the infrastructure nowadays. It facilitates the development of connections between regions within a country and between countries, and consequently, it supports the formation of mutual economic, social, cultural relations (Rudnev and Kudryavtsev, 2013). To evaluate the results of the transport infrastructure development, first of all it is necessary to determine the role of transport infrastructure in the overall system of transport and logistics. This approach allows identifying the factors and conditions that affect the transport infrastructure development; in the future, it can assist in determination of the range of measurement indicators and characterization of the transport infrastructure development (Grzelakowski, 2014). Logistics infrastructure which conditions the effective performance of the logistics processes comprises technical means, manners to handle them and systems of how to use them (Grzelakowski, 2014). Therefore, the logistics infrastructure is a set of various facilities, equipment and means and technical devices which facilitate the completion of the logistics processes in the logistics micro- and macro-systems (Grzelakowski, 2014).

14.0 Logistics Infrastructure and Regional Economy

A well-developed infrastructure minimizes these adverse effects between regions. It provides better locations for economic activities, lower transportation costs (Schwab, 2018), and complements production factors of labour and capital (Bruinsma and Rietvel, 2019). Many authors like Portugal-Pérez and Wilson (2010), Fadare *et al.*, (2015); Somuyiwa, *et al.*, (2015b) Rehman *et al.*, (2020) and Oladosu, (2023) have recently found that infrastructure including road, rails, and airports benefits developed economies by increasing total exports and reducing trade deficit, while supporting regional economic relations. Other literatures analyze the relationship using quality of roads; quality of railroads; quality of airports; quality of ports and marine resources. This lecture acknowledges the relevance of all these modal infrastructure,

however, attention will be on the ports and marine resources that subsumes blue economy.

14.1 Marine and Blue Economy

Blue economy according to the World Bank is “*the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem*”. It seeks to promote economic growth, social inclusion, and preservation or improvement of livelihoods while at the same time ensuring environmental sustainability). Matuga, *et al*, (2019) and Asekomhe, (2020) explained that blue economy aims to move beyond business as usual and to consider both economic development and ocean health as harmonious propositions. This is in line with all of the United Nations’ Sustainable Development Goals (SDGs), especially SDG 14 ‘life below water’. Thus, there is need to fashion a coordinated action towards sustainably manage, protect and preserve ocean now, for the sake of present and future generations (Hunt & Vincent, 2016).

The concept of “Blue Economy” or “Ocean Economy” is a recent but an increasingly popular concept that aims at safeguarding the world’s oceans and water resources. Blue economy (or Marine Economy) originated from the United Nations Conference on Sustainable Development Goals held in Rio de Janeiro in 2012. It was developed to ensure improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities (Smith-Godfrey, 2016). Blue economy champions the conservation of marine and aquatic ecosystems and sustainable use and management of associated resources to promote principles of equity, resource efficiency, social inclusion, and low carbon development (UNECA, 2016). This is further revealed in figure 13 and table 2 indicating tools, concepts and pillars within the framework of environmental, economic and social sustainability.

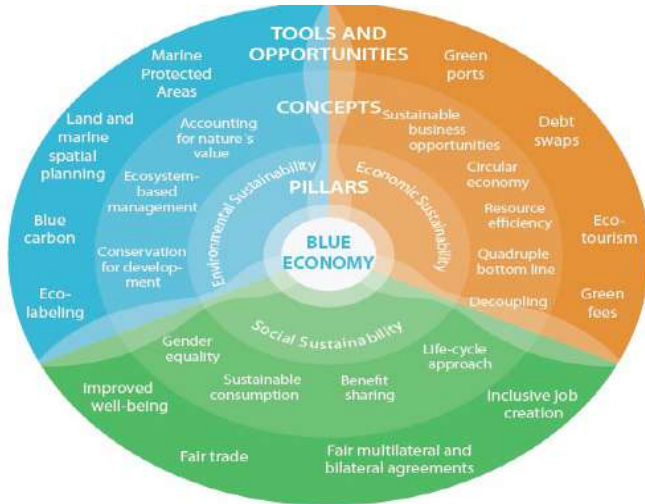


Figure 13: Tools, concepts, and pillars of the Blue Economy
 Source: UNECA (2016) Africa Blue Economy: A policy handbook.

Table 2: Tools, concepts, and pillars of the Blue Economy

BLUE ECONOMY	PILLARS		
	Environmental Sustainability	Economic Sustainability	Social sustainability
Tools and opportunities	Marine Protected Areas	Green ports	Improved well-being
	Land and Marine Spatial Planning	Debt Swaps	Fair trade
	Blue Carbon	Eco-tourism	fair multilateral and bilateral agreements
	Eco-labelling	Green fess	Inclusive job creation
Concepts	Accounting for nature's value	Sustainable business opportunities	Gender equality
	Ecosystem-based management	Circular economy	Sustainable consumption
	Conversation for development	Resource efficiency	Benefit sharing
		Quadruple bottom line	Life-cycle approach
		Decoupling	

Source: UNECA (2016) Africa Blue Economy: A policy handbook.

15.0 Logistics and Intermodal Transport

Mr. Vice-Chancellor Sir and distinguished ladies and gentlemen. It is interesting to emphasize on the relative importance of intermodal as part of infrastructure in facilitating effective and efficient Logistics and Supply Chain management.

15.1 Concept of Intermodalism

The trends towards sustainable development will have a considerable effect on the design and operation of logistics systems. In order to achieve balance between the globalization of economic activities and development of environmentally friendly global logistics networks, various approaches are being discussed and examined, ranging from construction of better hardware facilities to development of information structures for reorganizing logistics operations to make them more sustainable. Also introducing new concepts and technologies to logistics operations can contribute to sustainability (Somuyiwa and Gegeleso 2023).

In today's world, intermodal transportation forms the backbone of world trade. Contrary to conventional transportation systems in which different modes of transportation operate in an independent manner, intermodal transportation aims at integrating various modes and services of transportation to improve the efficiency of the whole distribution process. Parallel to the growth in the amount of transported freight and the changing requirements of integrated value (supply) chains, intermodal transportation exhibits significant growth.

Major players in intermodal transportation networks are shippers, who generate the demand for transportation, carriers, who supply the transportation services for moving the demand, and the intermodal network itself composed of multimodal services and terminals. The interactions of these players and their individual behaviour, expectations and often conflicting requirements determine the performance of intermodal transportation system.

Many transport systems are multimodal, that is the infrastructure supports various transportation modes, such as truck, rail, air, and ocean/river navigation, carriers operating and offering transportation services on these modes.

Intermodalism involves using at least two different modes in a trip from an origin to a destination through an intermodal transport chain, which permits the integration of several transportation networks. Intermodalism is the concept of transportation using more than one mode of travel in such a way that all parts of the transportation process are effectively connected and coordinated, safe, environment sound, and offering flexibility. It includes both the point of connections and the links between them. Intermodalism is expected to enhance the economic performance of a transport chain by using modes in the most productive manner. Thus, the line-haul economies of rail may be exploited for long distances, with the efficiency of trucks providing flexible local pick-up and deliveries. The entire trip is seen as a whole rather than as a series of legs, each marked by an individual operation with separate sets of documentation and rates.

The importance and relevance of intermodal transport are depicted in figure 14, while figure 15 revealed the policy framework or implementation of intermodal transport.

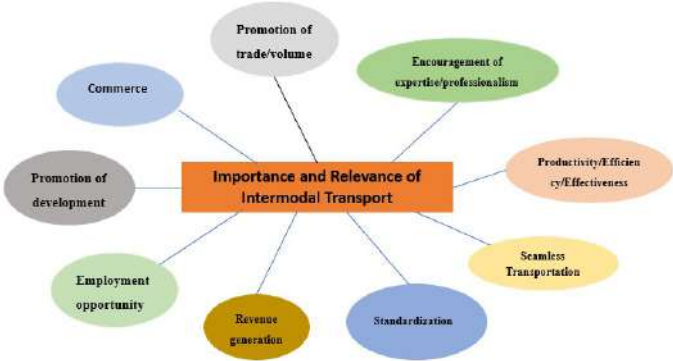


Figure 14: Importance and Relevance of intermodal Transport

Source: Adapted from Somuyiwa and Gegeleso (2023)

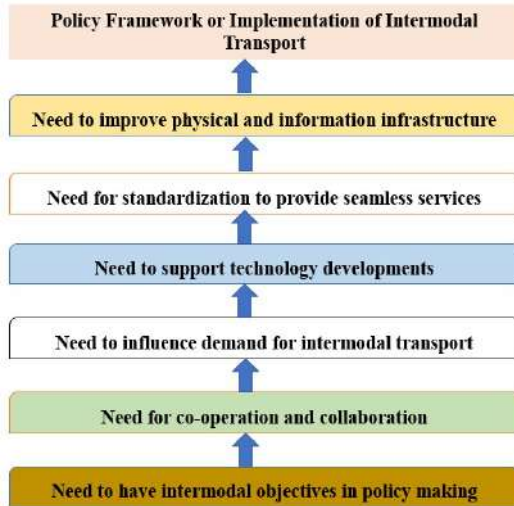


Figure 15: Policy Framework or Implementation of intermodal Transport

Source: Adapted from Somuyiwa and Gegeleso (2023)

16.0 CONCLUSION

Mr. Vice-Chancellor Sir, and distinguished guests, Somuyiwa (2020) and Victoria Transport Policy Institute (2021) espoused that, our present life in transportation was a resultant effect of decisions made in the past. As days go by, technology is shaping and reshaping how we do things and interact, so also there is change in sustainable transport development. Relating the sustainable transport development in the modernization theory, the essence of this development has been fostered in the figures 16 and 17 that both described sustainability of transportation with logistics performance in the area of social, environmental and economic developments. Social development is about affordability of transport, non-discrimination or fairness and human safety with cultural preservation and community cohesion. Travelers

should be able to travel with any mode of transport of choice, with affordable price and maximum security.

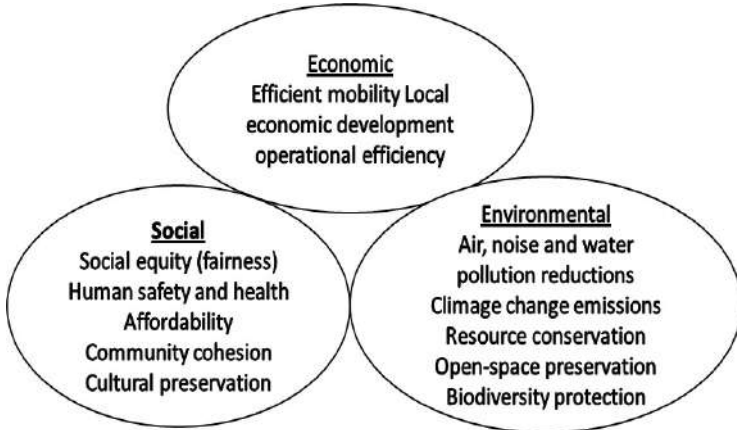


Figure 16: Sustainability of transportation with logistics performance in the area of social, environmental and economic developments

Source: Victoria Transport Policy Institute (2021)

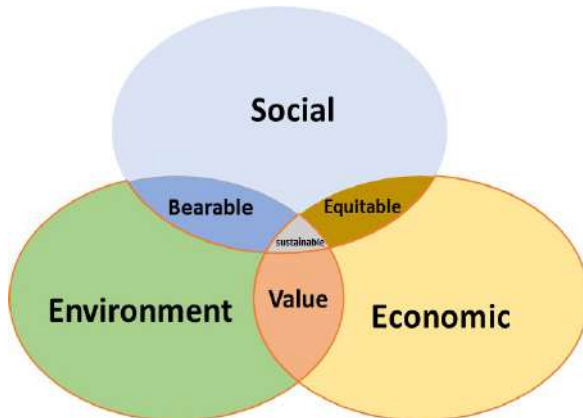


Figure 17: Pictorial representation of Sustainability of transportation and logistics performance within social, environmental and economic developments

Source: Somuyiwa (2020)

Furthermore, factors that inhibit connectivity and accessibility modal choice had been highlighted and germane to be the volume of carriage and speed of vehicle. Therefore, the peculiarity of characteristics of available modes of transport should be put to use in order to enhance Intermodalism. This implies that as the modal infrastructures are developed, connecting facilities should also be provided to cater for inter-modal transfers at major terminal points. These interface points must be equipped with adequate cargo transfer equipment. The effective functioning of the Inland Container Depots (ICDs) would reduce to a reasonable level some of the inefficiencies associated with transporting goods to hinterland locations, such as the exorbitant freight costs, traffic delays caused by the piece-meal loading, very slow movements and en-route breakdowns as well as armed robbery attack (Oni, 2000 and Adeniji, 2023).

To this end, the lecture is seeking the intervention of government at various levels not only to construct functional rail networks but also promote complementarity among various modes of transport relatively to the morphology of the environment. This is in line with Somuyiwa (2008), that suggested sustainable transport and city development in holistic manner with emphasis on internal consistency and complementarity with other policy areas in the economy and the environment, with provision of infrastructure within the framework of strategic management planning and societal marketing concepts that incorporate People, System and Organisation (PSO), simultaneously, ensuring these infrastructure do not only perform human welfares functions by meeting respective users requirements and satisfaction, but also profitable for the organizations that provide them, such that those facilities will give both high and immediate satisfaction and high long run benefits. For instance, water transport infrastructure that is underdeveloped and inadequately utilised should be developed and improved upon. This will ease the burden on road transport, consequently reduce pollution, congestion and other negative

externalities, and enhance movement and other logistics activities in the city.

Mr. Vice Chancellor sir, and distinguished guests, the summary of the treatise and this lecture is centred on the fact from the scripture: **Mathew 6:33**, but adapted thus: ***Seek and fix ye first Transportation and its Morphology, every other thing will fall in place***

In view of the above, the followings are recommended on how to fix the wheel of civilisation towards economic growth and national development.

17.0 RECOMMENDATIONS

Recommendations to public and private sectors

What to be done:

- ✓ **Infrastructural Development:** This is more related to building and upgrading of roads and rail networks, bridges and highways as well as, construction and development of Jetties and other inland waterways facilities, in order to provide connectivity across the country, simultaneously repair and maintenance of existing infrastructure to ensure smooth and safe mobility.
- ✓ **Sustainable Traffic management** that will incorporate modern traffic management systems to regulate traffic flow and reduce congestion as well as ensure improved travel.
- ✓ **Efficient and effective public transportation system** by investing in buses and various types of trains, as well as provision of enabling and favourable socio-economic and political climate that will encourage private participation in public transport. Furthermore, sustainable transport systems policy measures be introduced within the ambit of Transport Demand Management (TDM) that must be developed. Hence, government should develop and guide implementation of transport strategies through **4ps- Politics, Planning, Policy and**

Public service, which will all ensure steadily improving standards and targets in quality, pollution reduction and safety.

- ✓ **Enhancement of Road Safety measures** through strict enforcement of traffic laws, adequate monitoring of the enforcement agents, and regular safety campaigns to educate the public about Transport safety in general.
- ✓ **Logically implementable and socially acceptable comprehensive transportation plans** that incorporates commuting patterns and economic development, technology integration, and alternative mode of transportation, including non-motorised mode of transportation where appropriate. More importantly, encouragement of intermodal transportation system for ease of connectivity, centrality and accessibility of various modes of transportation.

17.1 How it should be done:

- Incorporation of professionalism will not only enhance capacity building, but able to provide professional advice to tackle disruptions/bottlenecks along the supply chain which will encourage value chain and equally foster economic development,
- In addition, the concept of Public Private Partnership will assist in a great deal, especially when Professionalism is incorporated. The government will only provide enabling environment, while various Private and Professionals at various nodes of Supply Chain will profess their competency and capability within the framework of sustainability of the concept that is predominantly on the interrelated organizations, resources, and processes that create and deliver products and services to end customers
- Promotion of Transport and logistics education capacity development to address the pervasive chaotic transportation scene in many developing countries, including Nigeria and needed to stimulate socio-economic development of the

countries, hence, Professionalism through well-structured series of examinations and or higher degrees is fundamental to ensuring that practitioners are well endowed to operate within the tenets of the profession and this has a bearing to the development of the country within which they exist.

Mr. Vice-Chancellor Sir, Transport and logistics education needs more synergy with the transport industry/Organisations/agencies with more industrial support and collaboration.

- In the area of marine and blue economy, there is the need for the Nigerian government and other maritime stakeholders to invest in blue economy development in order to sustain economic diversification, job creation, livelihood enhancement and poverty reduction in the country while taking the following steps:
 - Development of a well-articulated, robust, and comprehensive policies and plans based on tested ocean governance policy tools, with focus on maritime security and safety, fisheries & aquaculture, and port & shipping infrastructure.
 - Government and other maritime stakeholders should pay attention to all the ocean-based sectors with priority accorded to fisheries and aquaculture, port and shipping, offshore renewable energy, deep seabed mining, and coastal tourism sectors. These sectors, if fully harnessed would unlock a lot of economic, social, and environmental benefits to the county.
 - Nigerian government in conjunction with other relevant stakeholders must ensure strict adherence to the United Nations Convention on the Law of the Sea (UNCLOS) in order to build robust legal and institutional frameworks that will help the country achieve economic

diversification and development, food security, job creation, and poverty reduction based on blue economy strategies.

- There is need for the government to develop a strong partnership and network at local, regional, and international level to support the blue economy established sectors, like fisheries, tourism, shipping, and emerging sectors such as deep-sea mining, marine biotechnology, and renewable ocean energy. These partnerships will be useful in building human and institutional capacities, exchange of intellectual property, innovation, and multidisciplinary research that can help in realizing the full potential of the blue economy.

18.0 Acknowledgement

Mr. Vice-Chancellor Sir, I will like to thank the omniscient God and source of wisdom, for His supernal munificence towards me, particularly proclaiming **Himself** in all my endeavours, especially **Black Night of August 22, 2006, when I had a close shave with death and micro-seconds away from death**, and making it possible for me to present this inaugural lecture despite series of intrigues within and without. I give accolades to God Almighty, the potentate who provided and is still providing the **links** to the important **nodes** along the success **chains** of man.

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Mr. Vice-Chancellor Sir, the entire *omniom gatherum* in this commodious auditorium, permit me to say with pious audacity, that this inaugural lecture is the Lord’s doing and it is marvelous in our eyes and more reason I can say, *Veni Vidi Vici: I came I saw, I conquered.*

ISE OLUWA K’OLE BAJE

This and many others, I just professed.

Thank you for your listenership

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