NATIONAL PRESIDENT'S SPEECH

I have immense pleasure in welcoming all our special guests, CILT International President, distinguished resource persons, CILT members in Nigeria, our global CILT colleagues who have joined us virtually, and friends of CILT to the 2024 Annual National Conference and AGM of the Chartered Institute of Logistics and Transport, Nigeria. Our flagship event continues to provide the platform to interrogate and offer solutions to the challenges of logistics and transport in Nigeria within the context of the nation's desire to operate an integrated transport system that offers efficient, reliable, safe, secure and sustainable transportation choices for businesses and individuals.

Achieving these goals will address the logistics and transport infrastructure deficit highlighted in our past conferences. Following the global realization that efficient supply chains and logistics management are the livewire of sustainable businesses, be it public or private, supply chain and transportation have found their place in the boardroom and are no longer relegated to the transport department of establishments.

For over a century, the Chartered Institute of Logistics and Transport, International and in the case of CILT Nigeria, over six decades have provided the training needs of professionals in the supply chain and transport sector. We are the only professional Institute in Nigeria offering core courses in logistics and transport. We operate the curriculum and examination materials of CILT International, and successful candidates are awarded internationally recognized professional diplomas. I invite you to read page 4 of your Conference Programme for further details.

In addition to the traditional courses offered by CILT, we provide a unique short-term virtual Executive Masterclass on Supply Chain Management specifically designed for the occupants of C-Suite, and we are glad to note that CEOs and Executive Directors have expressed satisfaction with the new knowledge and skills acquired from the training. Eminent speakers from the industry and academia will steer conversations around the theme "Transforming Nigeria's Transportation and Logistics Systems for Development".

I believe you have studied the conference programme to see the rich menu served by the Conference Planning Committee led by Professor Oyesiku and Dr Boboye, OFR, and supported by a super team of experts. Issues around integrating technology in transport infrastructure, management and operational efficiency in transportation, the interconnectivity of transport modes, renewable energy and in-depth research with primary data from academia will be presented and discussed in the coming two days. We are pleased to continue with the innovation introduced at the 2023 Conference, where research papers presented in previous conferences are published as books after thorough editing by a group of CILT professors and researchers.

The Book of Proceedings has been recognized as a reliable research tool and used for the assessment and elevation of lecturers in academic institutions. I encourage you to purchase the 2023 and the 2024 Book of Proceedings published this year. We note the administrative segmentation of the transport-related Ministries and Agencies along different transport modes. This arrangement should not undermine, howsoever, the criticality of integrated transport planning and implementation.

Attaining a coordinated, collaborative, integrated transport system is a shared responsibility of the ministries in charge of the transport sub-sectors and citizens. We can achieve this only if Nigeria has a National Transport Policy. A final Draft of the National Transport Policy was produced in 2022. The Policy provides for integrated transport planning, operation, implementation and enforcement. It has chapters for each transport mode with the intention that the respective modes will develop detailed implementation policies that align with the globally agreed policy imperatives.

The Draft Policy recommends the establishment of a Coordinating Body at the level of Ministers to drive a Whole-of Government approach to transport planning and policy implementation. It promotes the integration of transport components into all the identified key economic sectors, which will lead to overall competitive products and services, resulting in market expansion and economic development of our country. Why has the Government not prioritized the approval and issuance of the Draft National Transport Policy? Why is there a lack of information on the very long delay? Again, we urge the Federal Government to request the urgent presentation of the Draft Transport Policy to the Federal Executive Council for consideration and approval.

I have agreed with my colleague, Prince Segun Obayendo, the President of CIOTA, to join forces in advocating the urgency of issuing a National Transport Policy to guide development in the sector. The two-day Conference is spiced with pleasant, fun surprises. The Local Organising Committee led by Dr Emmanuel Onwodi has organized multiple exciting social events, including dinners, technical tours, and a memorable closing dinner/dance for us. Again, I welcome you to the 2024 CILT Conference in Abuja, the beautiful, clean Federal Capital City.

Mfon Ekong Usoro, FCILT

President and Chairman of Council CILT, Nigeria

STATEMENT FROM THE CHAIRMAN, CONFERENCE PLANNING COMMITTEE

Distinguished Fellows, entire members of the Chartered Institute of Logistics and Transportation (CILT), esteemed speakers and guests, fellow professionals, and participants, it is my pleasure to welcome you to this CILT Nigeria, 2024 conference, holding at the nation's federal capital city and primarily being hosted by Abuja branch of CILT, Nigeria.

First and foremost, I wish to thank the national President of the Institute, our own amazon and outstanding leader in all ramifications, Barr. Mfon Usoro, FCILT, who has provided the ambience for the conference planning committee to package this year's conference. I am sincerely grateful to entire conference planning committee CPC members, especially, the chairpersons of the subcommittees and more importantly, the chairman and members of the Abuja branch, the hosting local planning committee, for selfless efforts and services rendered in the last nine months preparing for this year's conference. CILT, Nigeria, 2024 conference and annual general meeting is unique for several reasons. Firstly, its preparation started last December, immediately after 2023 CILT conference and by end of that year preliminary theme and subthemes were already considered. Secondly, the planning committee proposed Abuja branch to host 2024 conference and was warmly accepted and since early months of the year they swing into action. Thirdly, the CPC started regular weekly meetings as early as April 2024 and most members were in attendance, despite their onerous official jobs and responsibilities. It is for these reasons I must express my sincere appreciation to all.

This year's national conference focuses on the theme that is designed to support and complement the efforts of the Federal Government to transform the transportation and logistics systems of the country into more productive sector using the transformative power of technology in revolutionizing Nigeria's transportation and logistics system for sustainable development. This year's conference is also planned to address the challenges and opportunities facing our transportation and logistics sector and explores the complex dynamics between transportation systems and land use patterns in cities, highlighting the need for integrated strategies to develop modern transportation infrastructure with a view to creating sustainable, efficient, and equitable transportation systems that support liveable cities and overall development of the country.

The transportation and logistics sector are the backbone of any economy. It is the lifeblood that connects people, goods, and services. However, Nigeria's transportation and logistics system

faces numerous challenges, including inefficiencies, congestion, and lack of infrastructure. Against this backdrop, this conference brings together transportation and logistics professional, experts, thought leaders, academics and researchers and industry frontline chief executives to advance strategies towards: Leveraging technology to optimize transportation infrastructure; Enhancing logistics operations through data analytics; Digital innovation in supply chain management and Collaborative strategies for sustainable development.

The popularity of CILT Conference is growing every year, over 500 delegates and participants attended 2023 conference representing different sectors of transport and logistics organizations and public service of the country. We expect more this year from different segments of the industry, academia, the scientific community, professionals and government officials from within and outside the country.

The 2024 CILT Conference package includes several discussion panels, scientific papers presentation by speakers that include academics and practicing professionals and experts from different sectors of the industry and business community. The conference delegates will be able to take part in guided tours of immerse significance to the profession and the federal capital city of Abuja, namely: Abuja Light Rail Revolution Tour, including the Abuja City to International Airport terminal passenger facilities; and Abuja's Green Wheels in Motion Electric Car Showcase tour.

As I welcome you to Abuja, the most thriving national capital in the continent, I implore you be part of the gathering that will contribute to implementing integrated strategies, that can develop modern transportation infrastructure that supports economic growth and industrial development of this great country.

Prof. Kayode Oyesiku, FCILT
Chairman, Conference Planning Committee.

EXECUTIVE SUMMARY
CILT 2024 Conference Proceedings

Transforming Nigeria's Transport and Logistics Systems for Development

The 2024 CILT Conference Proceedings presents a comprehensive collection of expert insights, research findings, and policy recommendations aimed at shaping the future of Nigeria's transport and logistics systems. Under the overall theme, "Transforming Nigeria's Transport and Logistics Systems for Development," the papers address critical issues and innovative solutions across four key areas:

- **Modernizing Transport Infrastructure** – Strategies for upgrading road, rail, air, and water transport networks, leveraging technology and integrated systems to enhance connectivity,

efficiency, and economic growth.

- **Operational Excellence in Transport Systems** – Approaches to improving service delivery, safety, and supply chain performance through data-driven solutions, policy reforms, and enhanced regulatory frameworks.
- **Collaboration and Capacity Building** – Emphasis on fostering partnerships between government, industry, and academia, alongside developing a skilled workforce capable of driving innovation and sustainable growth.
- **Climate-Resilient Transport Infrastructure** – Highlighting the urgent need for climate-adaptive designs, sustainable transport technologies, and risk-based planning to safeguard infrastructure and communities against climate change impacts.

This volume offers essential guidance for policymakers, practitioners, researchers, and all stakeholders working to build a modern, resilient, and inclusive transport and logistics system that supports Nigeria’s economic and environmental future.

Strategies for Perfecting Nigerian Transportation and Logistics System as Catalyst for African Trade, and Industrial Development

By

Dr George A. Banjo

MD/CEO, Transport and Development Consultants Partners Limited

Keynote Paper Presented at the 2024 Annual Conference of the Chartered Institute of Logistics and Transport, Themed *'Transforming Nigeria's Transportation and Logistics Systems for Development'.* Abuja Nicon Luxury Hotel, 8-9 October 2024.

OBJECTIVE OF PRESENTATION

- PROVIDE A BROAD CONTEXT FOR DISCUSSIONS AROUND THE THEME OF THE CONFERENCE
- DEFINE BROAD STRATEGIES FOR IMPROVING TRANSPORT AND LOGISTICS SYSTEMS
- MAIN FOCUS ON LAND TRANSPORT WHICH CARRIES OVER 90% OF TRAFFIC, GREATLY IMPACTS LOGISTICS SERVICES AND INTERNAL AND EXTERNAL TRADE

OUTLINE OF PRESENTATION

1. INTRODUCTORY COMMENTS
2. NIGERIA'S TRANSPORT SYSTEM
3. NIGERIA'S LOGISTICS PERFORMANCE
4. SOME MACRO CONTEXT INDICATORS
5. RECOMMEDATIONS

1: INTRODUCTORY COMMENTS

SOMECONNOTATIONSFROMTITLEOFPAPER

- **Perfecting:** Connotes room for improvements in existing transport(ation) and logistics system. **Question** - How do we achieve the improvements?
- **Catalyst:** Implying yet to be developed, since being a catalyst is the first role of such systems before being CONSEQUENCE of development, i.e. responding to growing demand.
- **Promoting:** African Trade and Industrial Development: **How can they do this? AND are they even promoting Nigerian INTERNAL trade and economic development?**
- **NIGERIAN TRANSPORT AND LOGISTICS SYSTEM: DO THEY EXIST?**

ROLE OF TRANSPORT & LOGISTICS IN NATIONAL DEVELOPMENT

- Foster national cohesiveness, peace and general well-being
- Facilitate access to employment, health, education and other social services.
- Contribute to alleviation of regional inequality
- Promote cost effective access to markets (local, regional, national and international).
- **Catalyst to technological development and innovation, thus promoting local manufacturing and industrialisation.**

Objective of Transport Policy: Assure each mode (road, rail, pipelines, waterways, maritime and aviation) used to their comparative advantage in an integrated manner.

TRANSPORT'S ROLE IN LOGISTICS

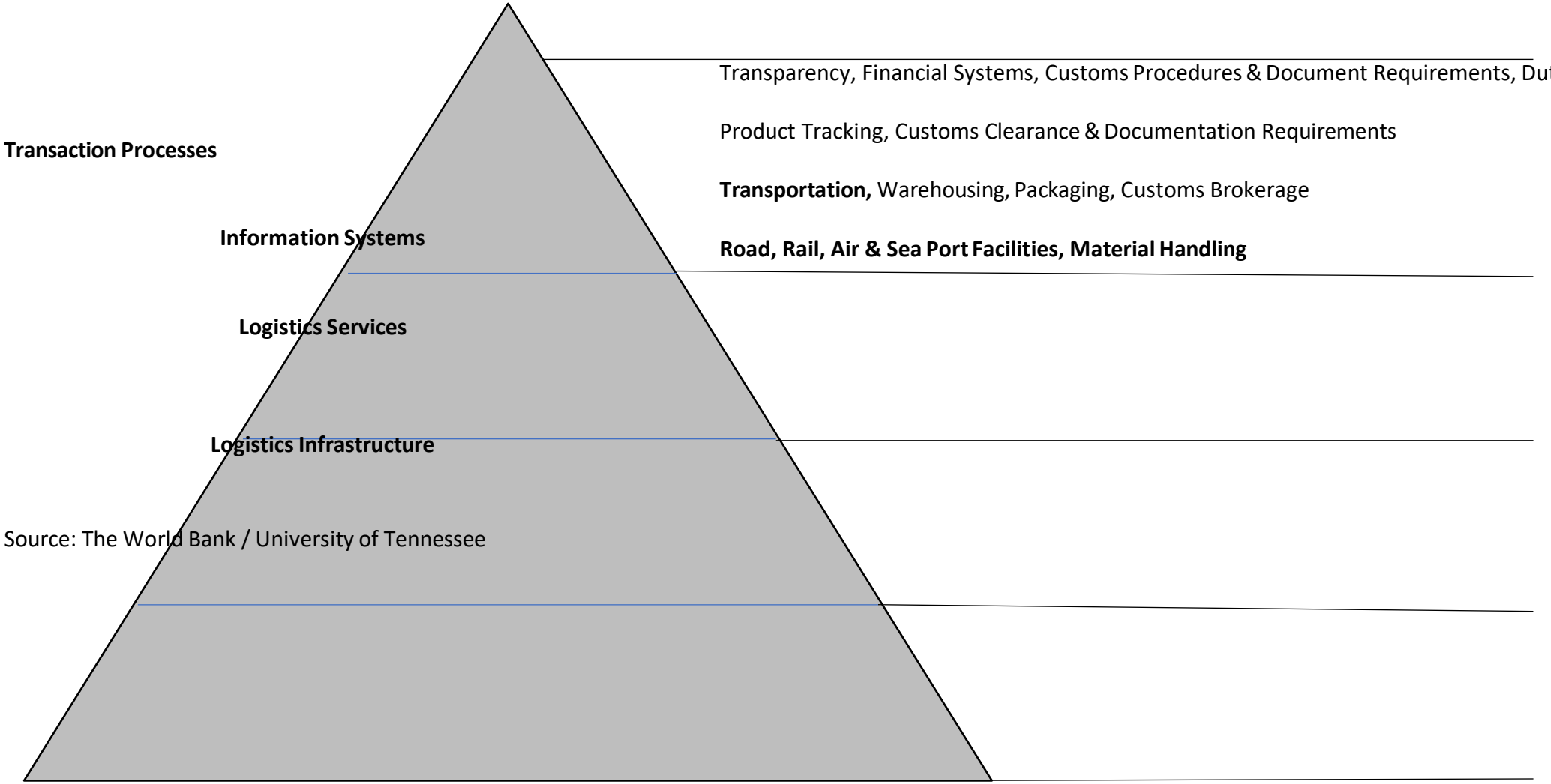
Transport plays a critical role by directly impacting efficiency, cost and reliability of the movement of goods:

- **Cost:** *Freight* – transport cost often largest component depending on mode of carriage. *Fuel prices*. *Infrastructure access cost* e.g. user charges.
- **Speed and Time Efficiency**: *Transit times. Delivery schedules. JIT*

concerns.

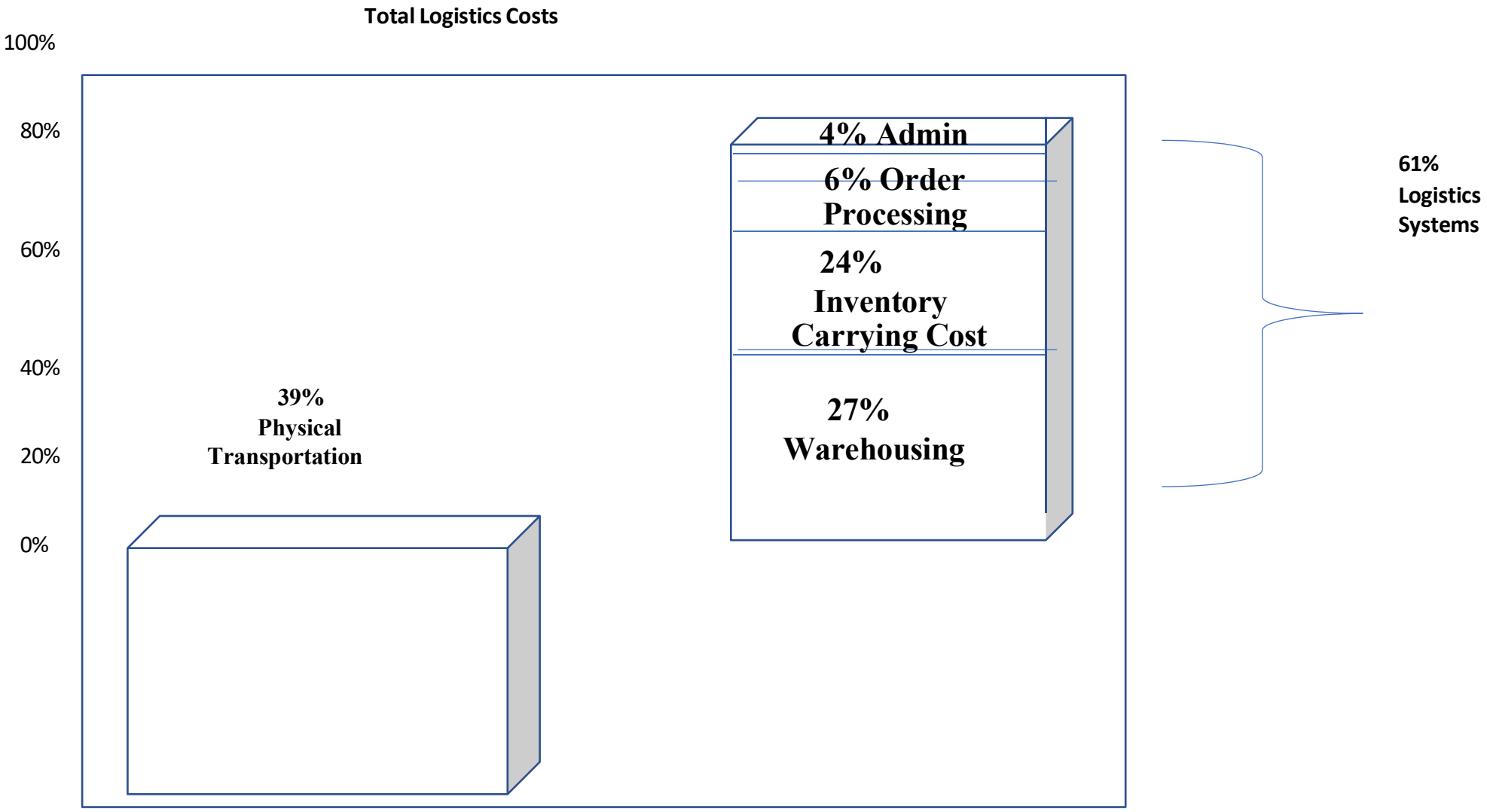
- **Reliability:** *Replicability* of service offering. E.g. rail more reliable but less flexible.
- **Flexibility:** *Accessibility* to O and D. *Scalability. Packaging*.
- **Environmental impact**: *Sustainability. Regulations*, affecting choice of mode and route which impact cost and time frames.
- **Inventory Management**: *Lead Times. Inventory Management*.
- **Customer Satisfaction**: *JIT* delivery; Keeping promise.
- **Globalisation**: *International shipping; Customs and Tariffs*
- **Technology:** *Tracking and Monitoring. Automation* – drones and autonomous vehicles

Building Blocks for Global Supply Chain Management



Source: The World Bank / University of Tennessee

The Link Between Transportation and Logistics System
Source: World Bank Private Sector Department, Workshop on Supply Chain Management, The Carnegie Center , February, 1998.



TRANSPORT INDUSTRY: THERE WAS A TIME

Vehicle Assemblying: Peugeot, Volkswagen, etc = motor cars; ANAMMCO

= Buses; Steyrs = Trucks; Etc.

Vehicle Components: Various companies manufacturing inputs e.g. tyres, batteries, windscreen, brakepads, etc,

Bicycles: Raleigh

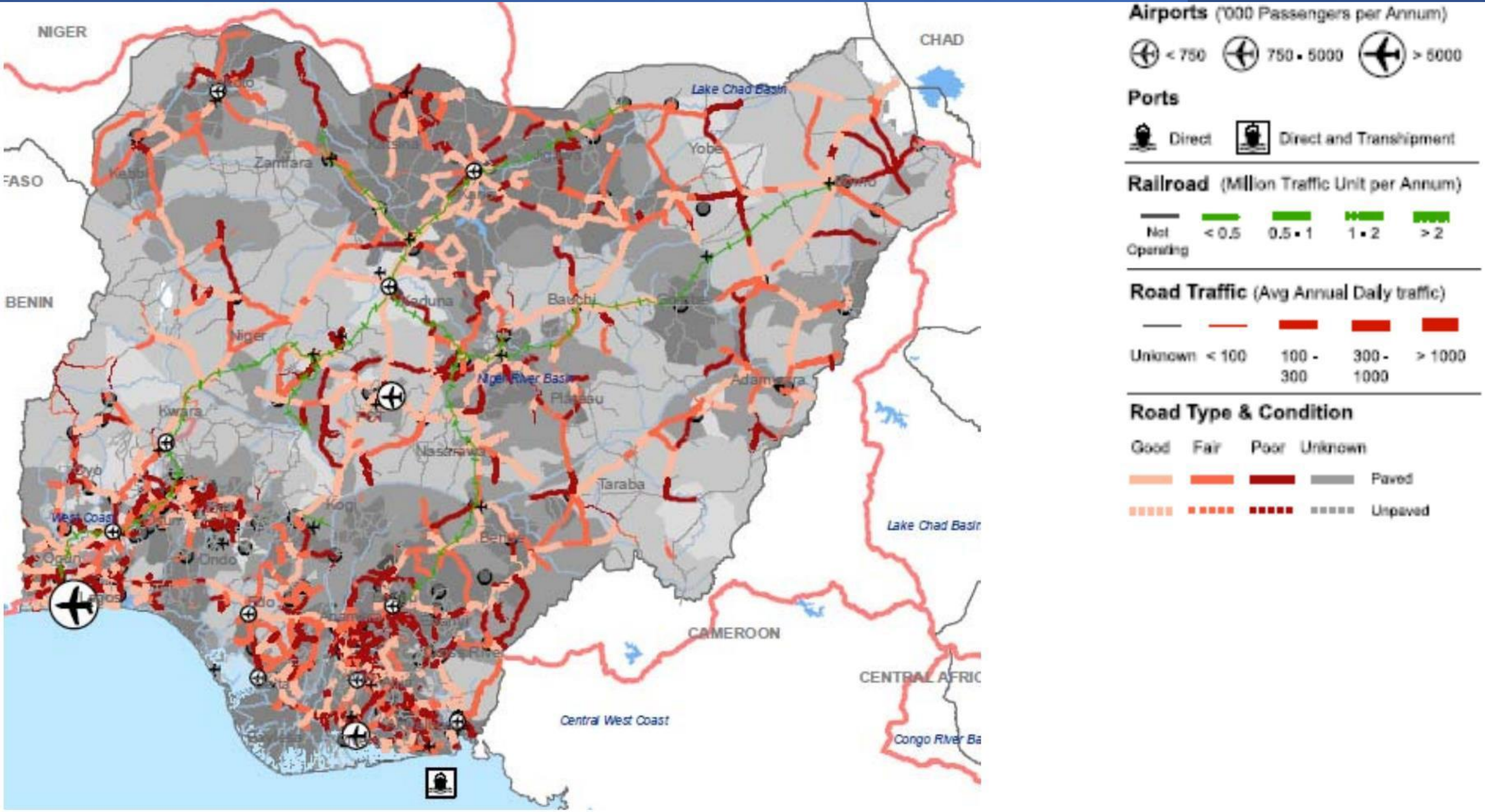
Airlines: Nigeria Airways; Virgin Nigeria; Kabo; Okada; Bellview; Etc providing local, international and regional operations.

What led to their demise? Studied and documented? Lessons applied?

2: NIGERIA'S TRANSPORT SYSTEM

NEXT SLIDE SHOWS A MAP OF THE TRANSPORT NETWORK

SOURCE: AFRICA INFRASTRUCTURE DIAGNOSTIC REPORT, NIGERIA COUNTRY REPORT


NIGER
CHAD
FASO
BENIN
CAMEROON
CENTRAL AFRIC
Lake Chad Basin
Niger River Basin
West Coast
Central West Coast
Congo River Ba
Zamfara
Kebbi
Yobe
Bauchi
Kaduna
Niger
Kwara
Plateau
Nasarawa
Taraba
Adamawa
Kogi
Benue
Ondo
Ogun
Lagos
Edo
Airports ('000 Passengers per Annum)
< 750
750 - 5000
> 5000
Ports
Direct
Direct and Transhipment
Railroad (Million Traffic Unit per Annum)
Not Operating
< 0.5
0.5 - 1
1 - 2
> 2
Road Traffic (Avg Annual Daily traffic)
Unknown
< 100
100 - 300
300 - 1000
> 1000
Road Type & Condition
Good
Fair
Poor
Unknown
Paved
Unpaved

Brief Overview: Colonial Period

Export of domestic resources (mainly cash crops).

- Emphasis on the provision of railway services, provided from 1898.
- Next, establishment of water transportation.
- Then, construction of first interregional roads (north south) in 1906.

Investments made with minimum possible resources

Sub-standard roads inadequate for high traffic volume/HGV

Rail alignments with sharp curves.

Brief Overview: Post Independence Period

Re-positioning of sector for the social and economic development of the country.

Accelerated by the discovery of oil

Initial considerable investment in pipeline followed by considerable investment in roads and seaports, mainly during the 1970s and 1980s.

Resulted in infrastructure assets, 189,000 kilometres of paved and unpaved roads, numerous ports facilities and about 9,000 kilometres of pipelines, about 3,000 kilometres of navigable inland waterways and a rail network of about 3,500 kilometres.

Road transport is backbone of Nigeria's transport system. Carries about 90 percent of the country's goods and passenger movements.

ROAD NETWORK SIZE

Road type	Ownership			Total
	Federal	State	Local	
Paved main roads	25,500	10,400	-	36,900
Unpaved main roads	5,600	20,100	-	25,700
Urban roads	-		21,900	21,900
Main rural roads	-		72,800	72,800
Village access roads	-	-	35,900	35,900
Total	32,100	30,500	130,600	193,200
Percentage	17	16	67	100

Federal road trunk service, 1995

ROAD NETWORK USE AND CONDITION

Use	Federal	State	Local
Share of network length (%)	17	16	67
Use of network (veh/km) (%)	**50**	**25**	**25**

Condition	Federal	State	Local
Good	50	30	5
Fair	20	30	20
Poor	30	40	75

Federal road trunk service, 1995

FEDERAL BUDGETARY ALLOCATION &

RELEASES 2015 - 2021 (Billion Naira)

Year	2015	2016	2017	2018	2019	2020	2021	2022	Total
Budget	18.132	260.083	274.253	356.774	223.255	227.964	241.864	N/A	1602.325
Released	18.132	198.300	177.000	100.760	145.013	227.964	115.804	N/A	982.973
%	**100.0**	**76.2**	**64.5**	**28.2**	**65.0**	**100.0**	**47.9**		**61.3**

FUNDS FROMOTHERSOURCES(million naira)

Item	SUKUK	Presidential Infrastructure Development Fund	Road Tax Credit Scheme	Total	Remarks
Allocated/ approved	957.00	1,314.75	Not available	-	

Utilised/paid / contract sum	362.00	419.09	20,562.00	21,300.00	This is taken as amount that will be disbursed in completing

RURAL ACCESS AND MOBILITY

RURAL ACCESSIBILITY AND MOBILITY- 2

- Rural accessibility index of 25.5%
- Implies about 75% rural dwellers have no access to all weather road
- Higher in north due low population density
- Contributes to rural poverty being higher than urban poverty
- Contributes to high food costs
- Accessibility being addressed but not mobility

RAIL: NETWORK

3,500 km narrow gauge single track including 715km branch lines

827km of narrow-gauge sidings and loops

327km of standard gauge rail line, 187km of standard gauge rail line; 280 stations & 267 outstations;

- South Africa, 26,000 kms of rail track of which about 4,000 kms branch lines to customer locations.

- **RSA land mass of about 1.2 million sq km: Nigeria about 1 million sq km**

RAIL: HISTORIC TRAFFIC OF NRC

YEAR	TONNES	PASSENGERS
1976/77	1.689	7.414
1977/78	1.170	6.485
1978/79	0.995	8.455
1979/80	1.296	9.473
1980	1.309	8.236
1981	2.142	9.722
1982	2.166	12.710
1983	1.529	12.983
1984	1.306	15.419
1985	1.220	11.350
1986	0.850	9.880

Source: Revitalization study, final diagnostic report, 1988

RAIL: HISTORIC TRAFFIC OF NRC TO PORTS

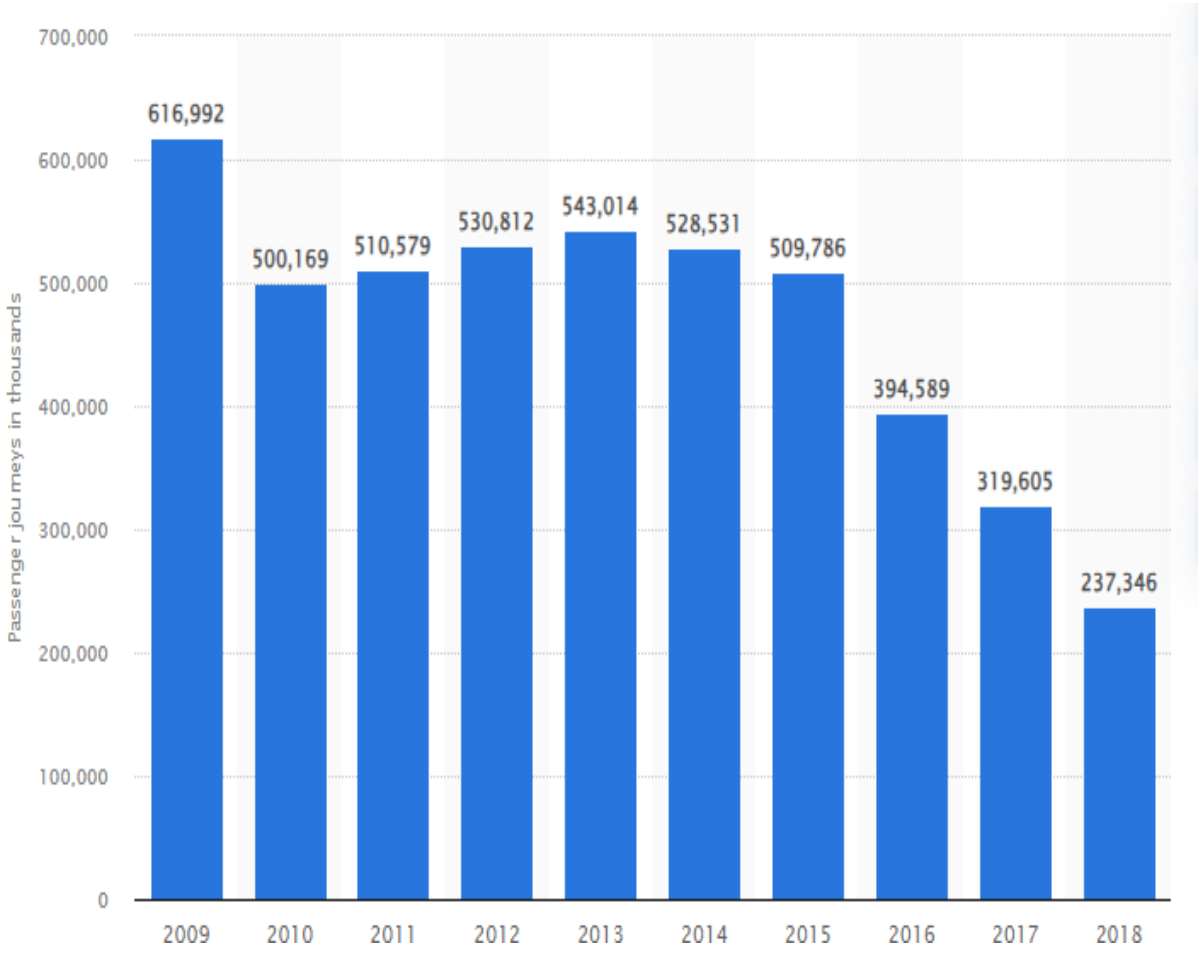
Share (%) of Port Traffic (export + import)

Year	Export		Import		Total	
	Rail	Road	Rail	Road	Rail	Road
1966/67	26%	74%	49%	51%	41	59
1968/69	28	72	49	51	41	59
1970/71	15	85	32	68	22	78
1972/73	11	89	21	79	14	86
1974/75	8	92	12	88	9	91
1976/77	5	95	11	89	5	95

Source: Revitalization study, final diagnostic report, 1988

NIGERIAN & RSA RAIL TRAFFIC COMPARISON

Item	2019	2020	2021	2022
Passengers ('000s)	2,890.1	1.0	2,714.5	3,212.9
Goods/Cargos ('000sTons)	200.1	87.4	142.4	125.8
Passenger Revenue (million ₦)	2.4	1.7	5.7	4.5
Goods/Cargos Revenue (million ₦)	362.9	281.4	299.8	436.0
Other Income Receipts (₦)	64.6	5.2	38.4	607.8



NBS, Rail transport Q3, Q4, 2021

Goods traffic = 113,342 million ton-km (2008)

Statista 2024

NIGERIAN PORTS AND ICDs

PORTS IN NIGERIA

- Lagos Port Apapa
- **Tin Can Island Port**
- Rivers Port
- **Onne Port**
- Delta Port
- Calabar Port.
- **Lekki Deep Sea Port.**
- Bakassi Deep Sea Port?

Source: Nigerian Shippers Council Website

Location	Capacity (Teus)	Concessionaire	% Complete
Erunmu, ibadan-oyo state	50,000	Catamaran logistics ltd	10
Isala ngwa, abia state	50,000	Eastgate ltd	5
Helpang, jos-plateau state	20,000	Duncan maritime nig ltd	48.40
Zawachiki, dala-kano state	20,000	Dala inland dry port ltd	100
Zanfarawa, funtua-kastina state	10,000	Equitorial marine oil & gas ltd	93.5
Jauri, malduguri – borno state	10,000	Migfo nig. Ltd	5
Kaduna inland dry port	5,000	Inland container nig ltd (icnl)	In Operation

ICDs: OTHERAPPROVED LOCATIONS

Other approved locations for ICDs / Container Freight Stations (CFSs), which were concessioned to private sector operators by the ICD Implementation Committee of the Federal Ministry of Transport are follows:

Isiala Ngwa, Aba

Erunmu, Ibadan

Heipang, Jos

Zawachiki, Kano

Zamfarawa, Funtua

Jauri, Maiduguri

ICNL, Kaduna

- **In addition to the seven (7) gazetted ICDs, there have been proposals from the private sector to establish ICDs at Dagbolu in Osun State, Lolo in Kebbi State, Onitsha in Anambra State and Ogwashi-Uku in Delta State.**

INLAND WATERWAYS

- Cost effective in moving people and goods even over rail and roads
- Can play complementary role for intermodal and integrated transport
  - Particularly in rural and urban areas where it often is only available first and last mile connections
- Poor safety record due inadequate regulation and low technology

PIPELINE

Network of about 9,000kms in length, north south, east west.

Not managed as a transport mean. Without it, products it carries would go by road/rail. An underutilised mode.

Inadequate use contributes to some of the failings of the sector.

Suffers from some risk associated with infrastructure development such as high capital cost, high technical operations and management requirements.

- Ideal mode for transportation of some special and bulky commodities like water, oil and gas. Safer and cheaper, especially for long distance carriages.

In Summary: State of the Transport System

All elements suffer from past lack of investment, esp. on maintenance and expansion.

Roads due lack of maintenance often require reconstruction.

Vehicles and equipment due inadequate replacement and poor maintenance, contributing to high social costs of atmospheric pollution, and high operating costs.

Railways, lack of necessary resources to keep tracks, rolling stocks and maintenance facilities in good working condition. **Deepened by monopolistic operation by NRC crowding out private sector participation and burdened public sector with investment needs that it could not fulfil.**

DEPICTING THE TRANSPORT SYSTEM

Since 1980's and NOW:

Operating in a crisis largely due imbalance between the needs of Nigerian society and the economy for adequate transport services and the ability of the sector to meet such demands.

Imbalance has two dimensions: between absolute demand and supply **AND**
between the nature of the existing demand and supply.

Demand for good quality and affordable services as against provision of services which are costly, unsafe, unreliable, environmentally polluting, etc.

CHALLENGES & OPPORTUNITIES FOR SECTOR

- **Challenge** - Redress the imbalance to make it a positive force for the achievement of the Government's macro-economic and social objectives.

- **Opportunities.** Size of the country (924 thousand sq. kms), population (about 230 million), economic resources (petroleum, gas and solid mineral resources, agricultural and forest resources), coastline of about 850 kilometres, seaports for transshipment to W and C African sub-region.

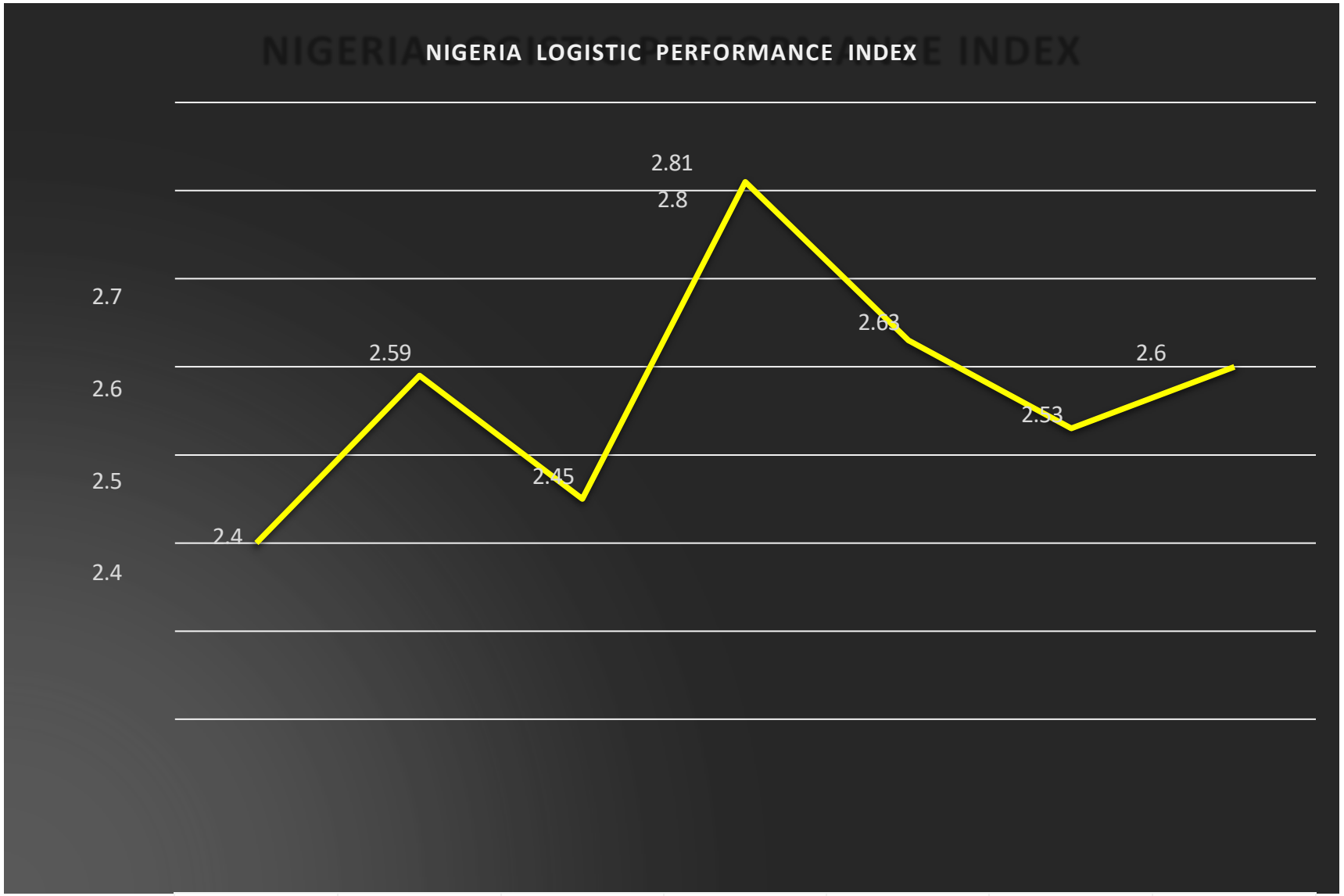
- **High transport demand and growing BUT sector unable to adequately respond.**

Efficient land transport (road, rail, pipeline together with inland waterways) is pivotal to the sector and its logistics system contributing to efficient internal and international movement .

SECTOR REFORMAN UNFINISHED BUSINESS

- **Road sector reform - 1974 to 2024:** A fifty-year journey.
- RV2000 proposals aborted & FERMA created which is inadequate.
- **Road Sector Financing:** Establish Road Fund to meet road maintenance needs – **Status unclear**.
- **Rail sector reform:** 1992 to 2023: **Output** - Repeal of Railway Act but implementation ad hoc in absence of enabling legislation.
- **Sector Regulation:** Establish Transport Sector Commission – pending, due lack of consensus on implementation modality?

3: NIGERIA'S LOGISTICS PERFORMANCE


NIGERIA LOGISTIC PERFORMANCE INDEX
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LPI 2007
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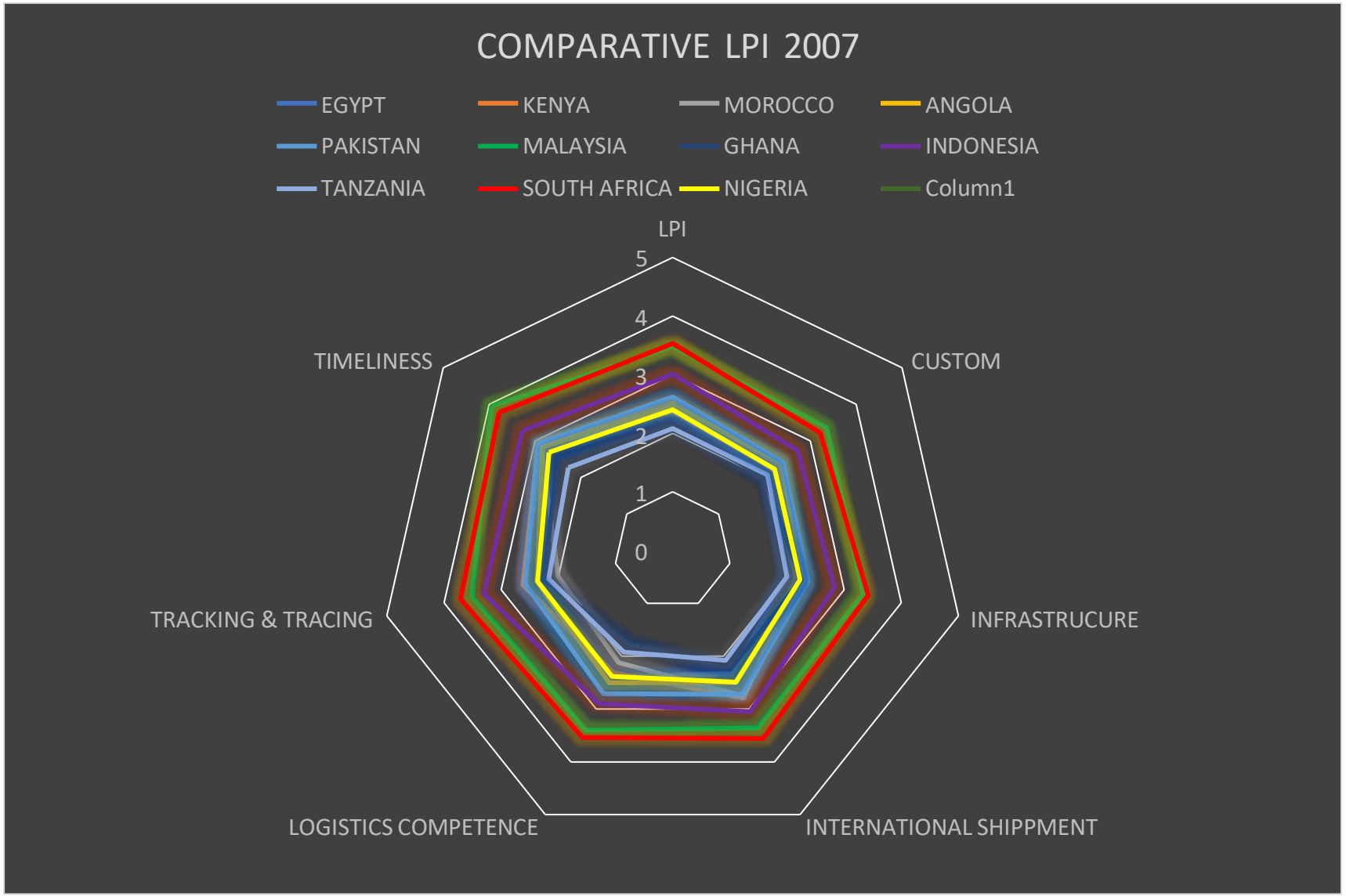
Data Source: World Band Development Reports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CUSTOM
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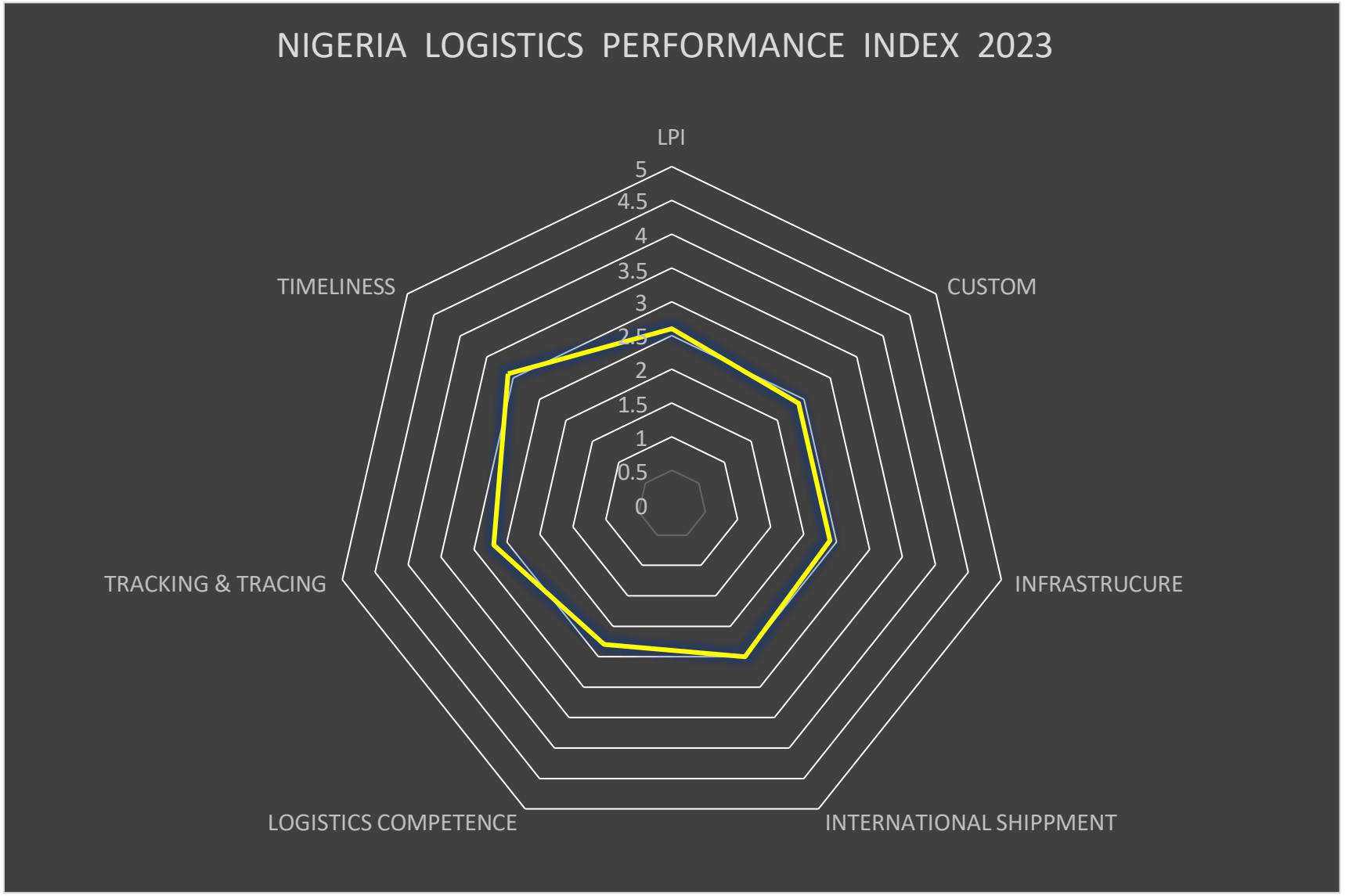
TRACKING & TRACING
TIMELINESS

Data source: World Bank Development Reports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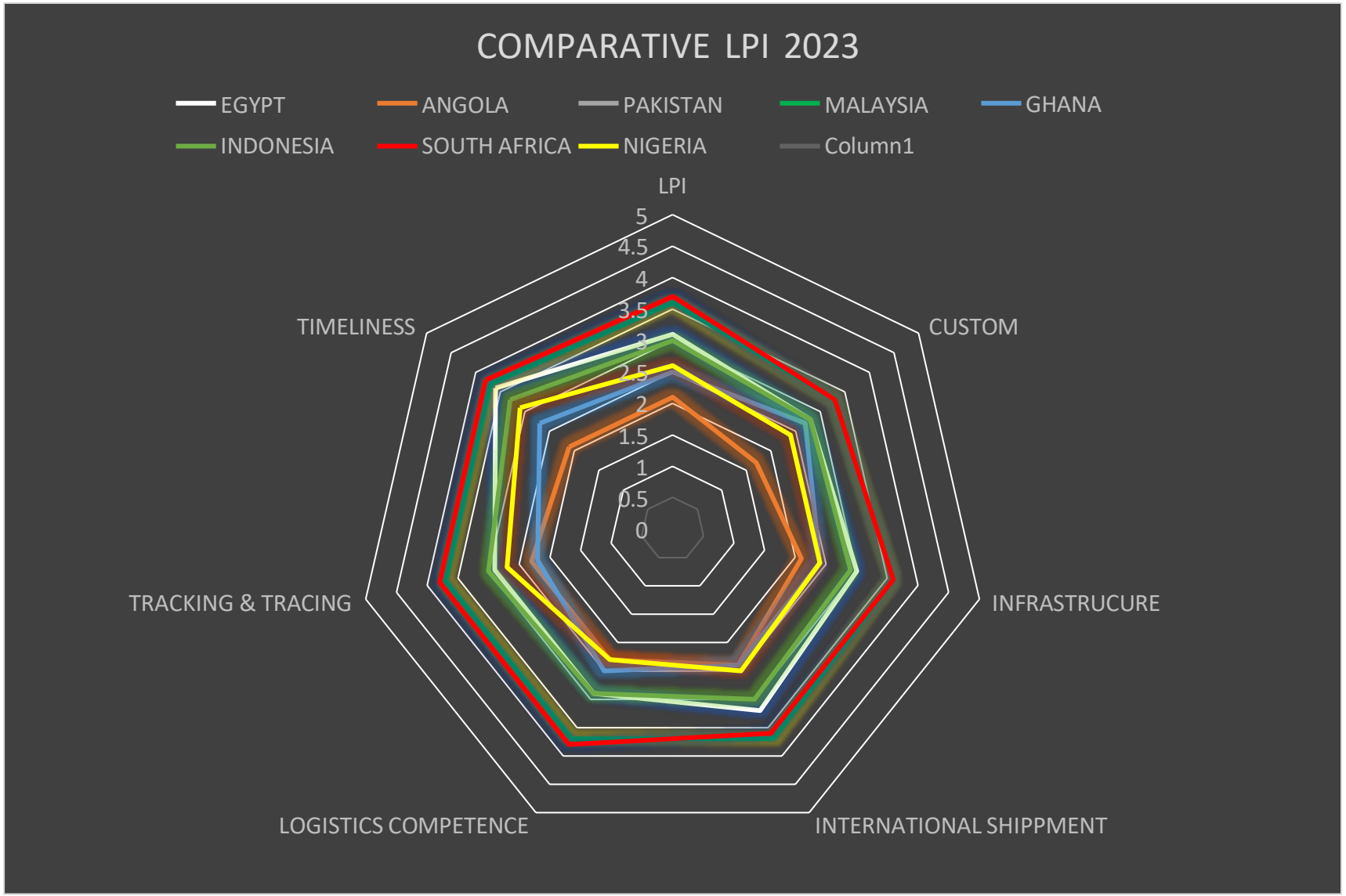
Data source: World Bank Development Reports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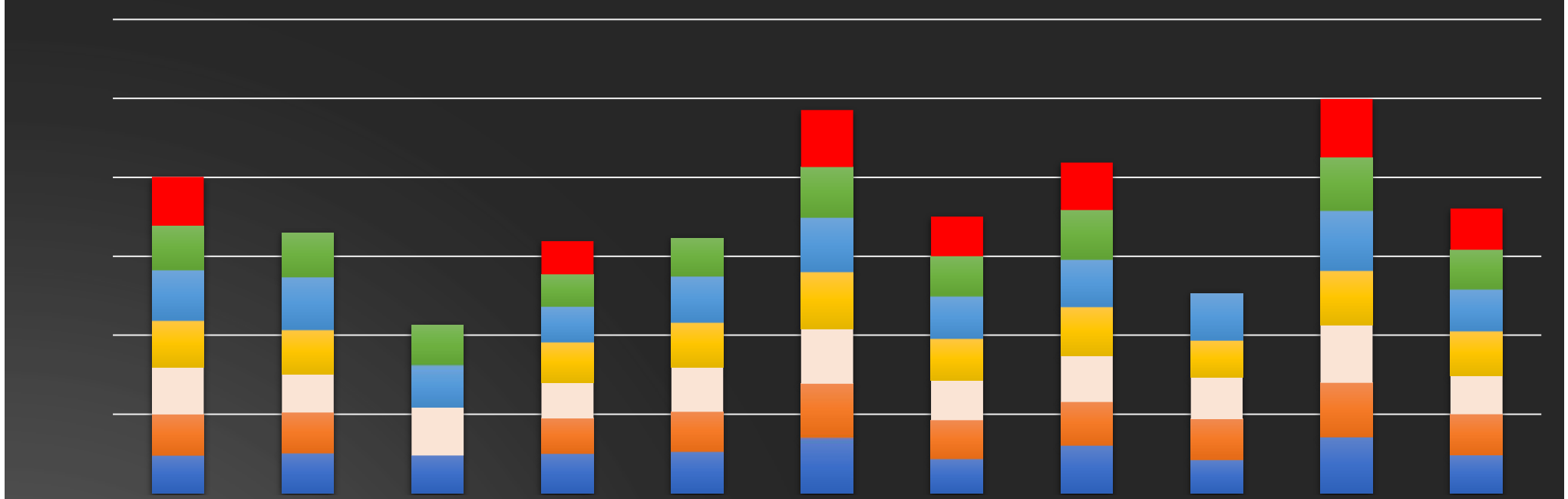
Data source: World Bank Development Reports

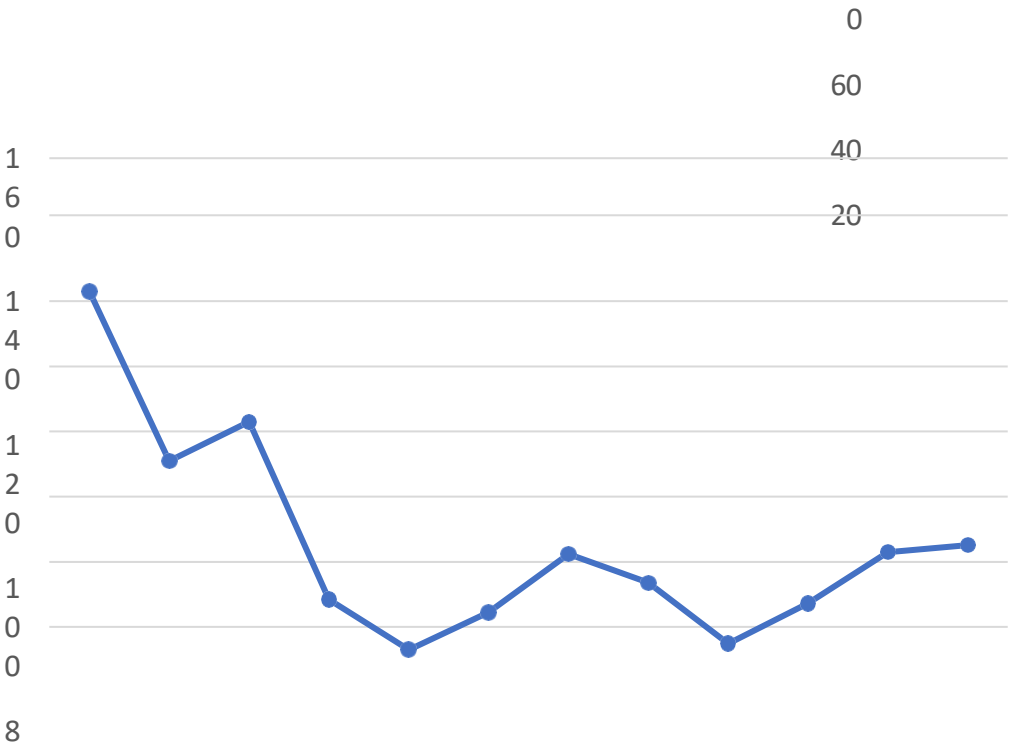
COMPARATIVE LOGISTICS PERFORMANCE INDEX



	EGYPT	KENYA	MOROCCO	ANGOLA	PAKISTAN	MALAYSIA	GHANA	INDONESIA	TANZANIA	SOUTH AFRICA	NIGERIA
2023	3.1	0	0	2.1	0	3.6	2.5	3	0	3.7	2.6
2018	2.82	2.81	2.54	2.05	2.42	3.22	2.57	3.15	0	3.38	2.53
2016	3.18	3.33	2.67	2.24	2.92	3.43	2.66	2.98	2.99	3.78	2.63
2014	2.97	2.81	0	2.54	2.83	3.59	2.63	3.08	2.33	3.43	2.81
2012	2.98	2.43	3.03	2.28	2.83	3.49	2.51	2.94	2.65	3.67	2.45
2010	2.61	2.59	0	2.25	2.53	3.44	2.47	2.76	2.6	3.46	2.59
2007	2.37	2.52	2.38	2.48	2.62	3.48	2.16	3.01	2.08	3.53	2.4

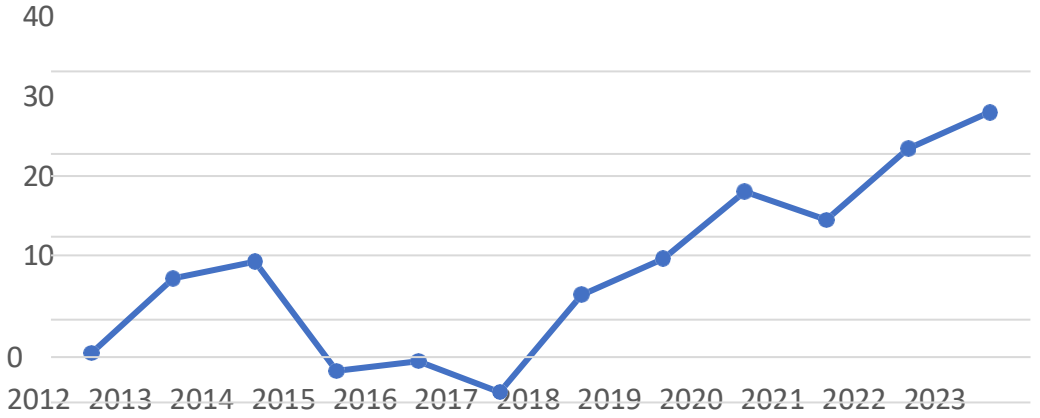
Data source: World Bank Development Reports

DECLINING EXPORT, INCREASING IMPORT

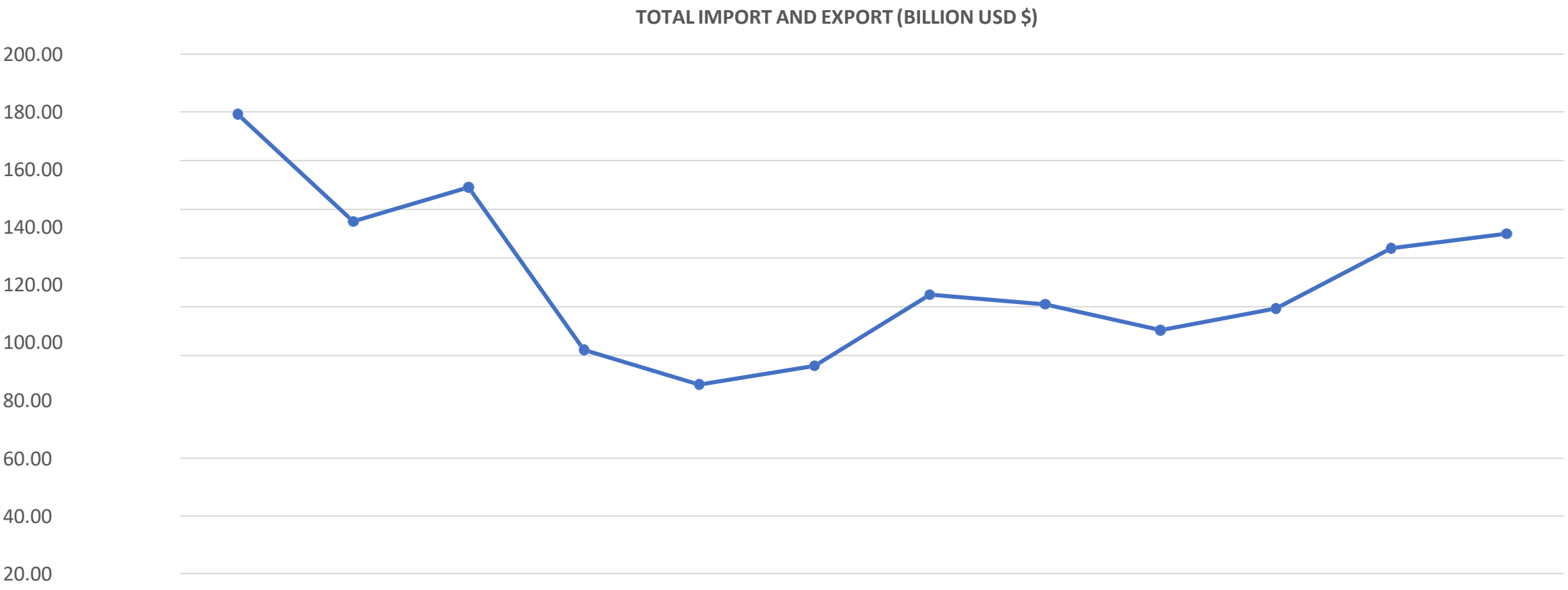


NIGERIA TOTAL EXPORT (BILLION USD $)


NIGERIA
TOTAL IMPORT (BILLION USD $)
70
60
50
0
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023


40
30
20
10
0
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

DOWNWARD TREND A TEMP RELIEF FOR SECTOR

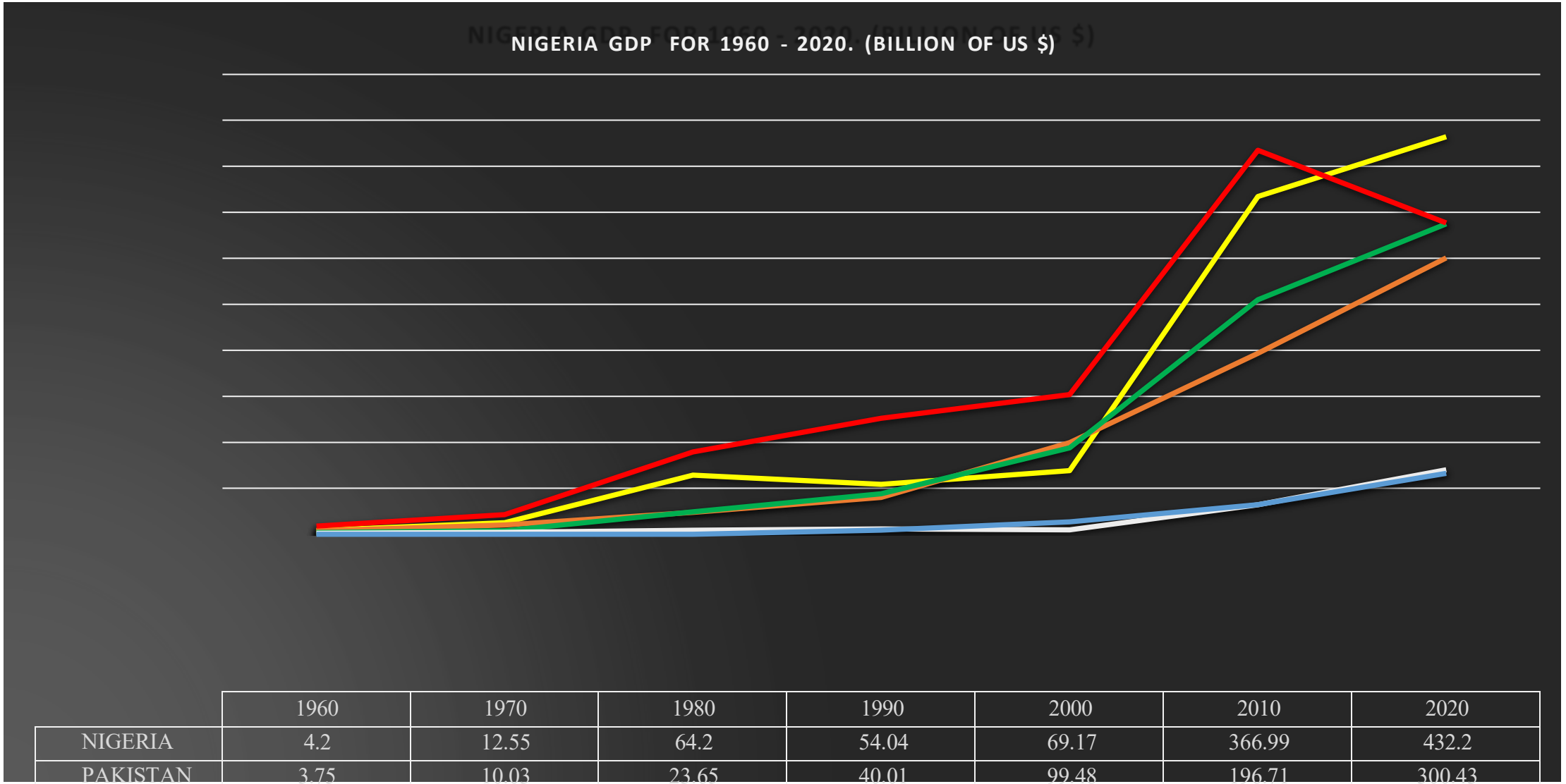



0.00
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

4: SOME MACRO CONTEXT INDICATORS

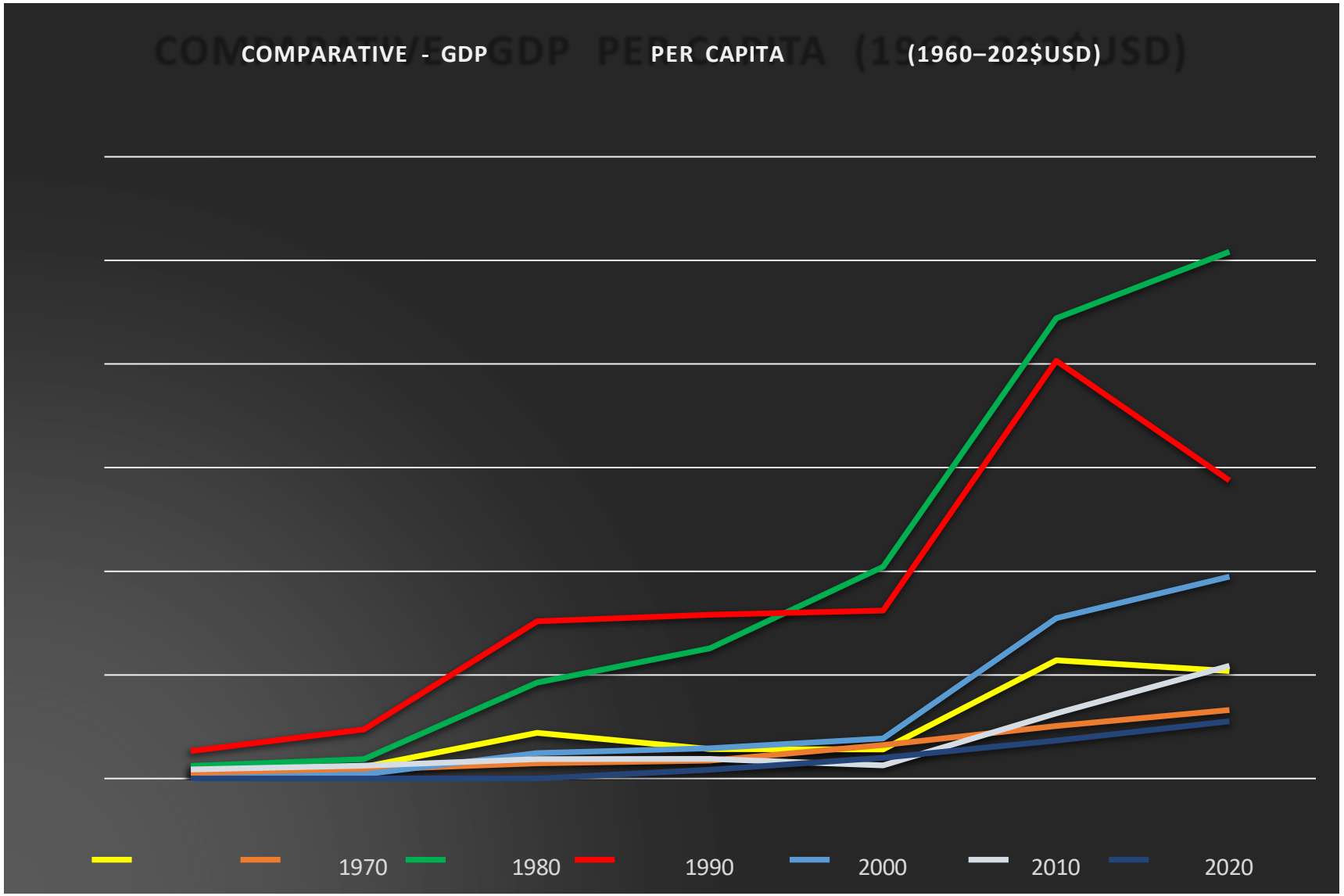
SOME SOCIAL INDICATORS

- Early 2023, total unemployment 33.3% and youth unemployment 42.5%.
- Inflation rate over 33%.
- Human Development Index relatively low at 0.54 in 2022
- Life expectancy at 55 years < SSA average of 61 years.
- Education spending only about 50% of SSA of US$52 per capita.
    - Child born today will only be 36% productive compared to if having access to good education & health services.
- Poverty rate high: poor people in 2023 about 104 million and increasing



	1960	1970	1980	1990	2000	2010	2020
NIGERIA	4.2	12.55	64.2	54.04	69.17	366.99	432.2
PAKISTAN	3.75	10.03	23.65	40.01	99.48	196.71	300.43
MALAYSIA	1.92	3.86	24.49	44.02	93.79	255.02	337.46
GHANA	1.22	2.21	4.45	5.89	4.98	32.2	70.04
TANZANIA	0	0	0	4.26	13.28	32.01	66.07

Data Source: world Bank Development Report

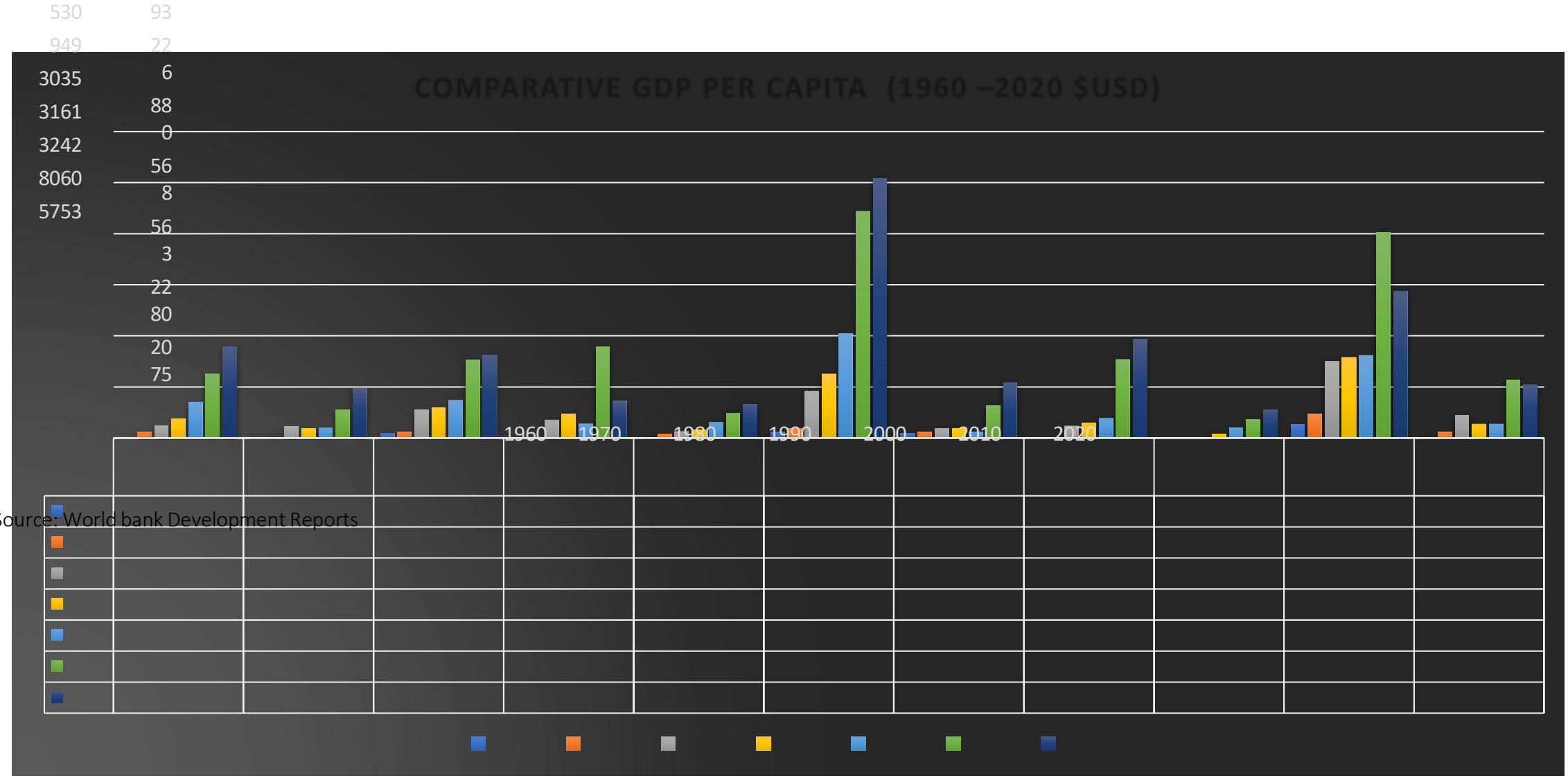

COMPARATIVE - GDP PER CAPITA (1960–202$USD)
12000
10000
8000
6000
4000
2000
0
1960
1970
1980
1990
2000
2010
2020

NIGERIA PAKISTAN MALAYSIA SOUTH AFRICA INDONESIA GHANA TANZANIA

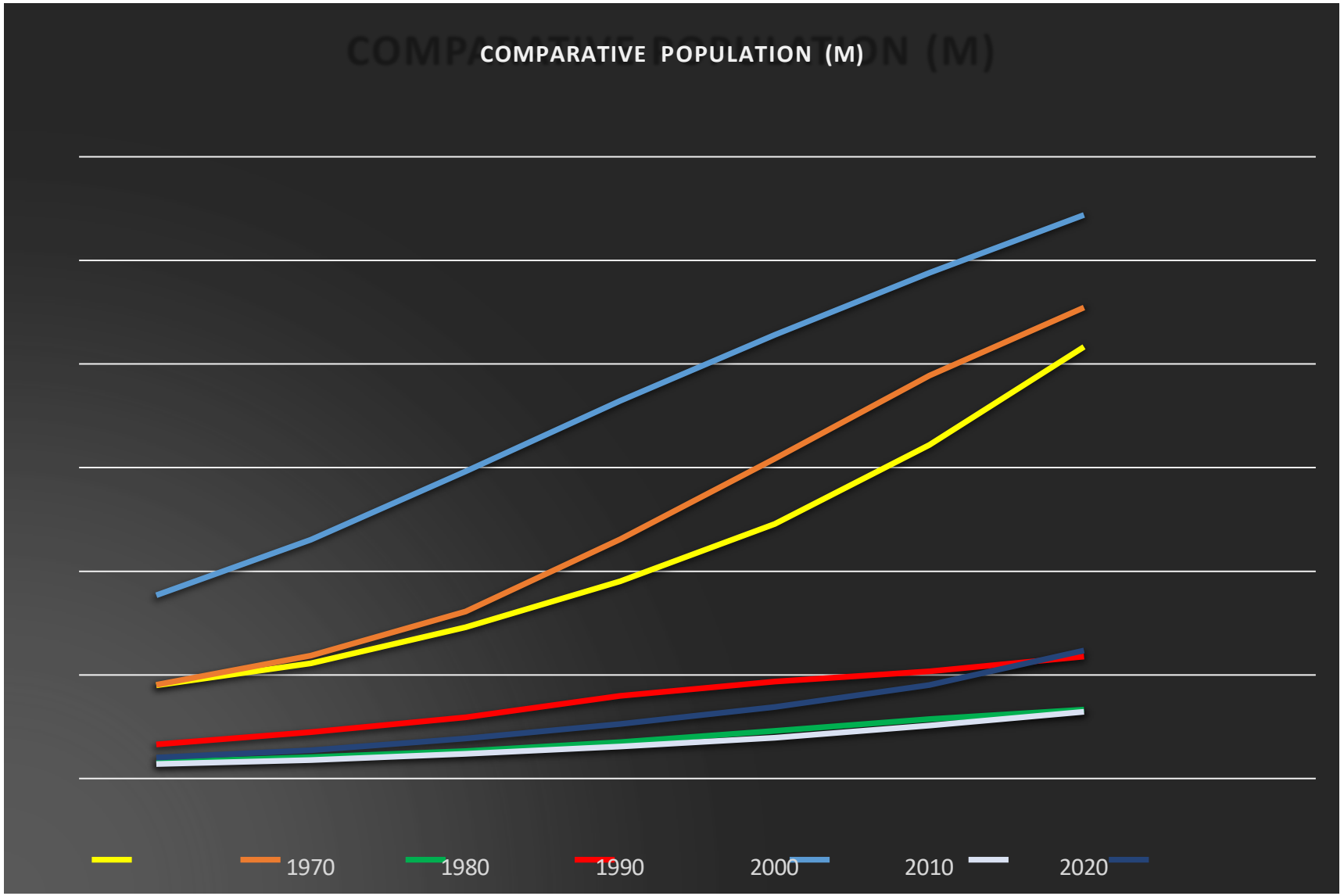
Data Source: World Bank Development Reports

COMPARATIVE GDP PER CAPITA (1960 –2020 $USD)

	EGYPT	KENYA	SOUTH AFRICA	MOROCCO	ANGOLA	PAKISTAN	MALAYSIA	GHANA	INDONESIA	TANZANIA	NIGERIA
1960	0	99	102	173.0	3258	0	82	245	177	0	0
1970	23	2510	140	0		0	169	375	250	79	0
1980	1	3572	449	258		712	293	1853	375	489	0
1990	49		370	1098		950	347	2513	381	583	167
2000	5		412	1219		557	644	4088	253	771	399
2010	75		1094	1492		3587	1012	8880	1259	3094	731
2020	1		1936	3068		1451	1322	10164	2177	3896	1104
	13										

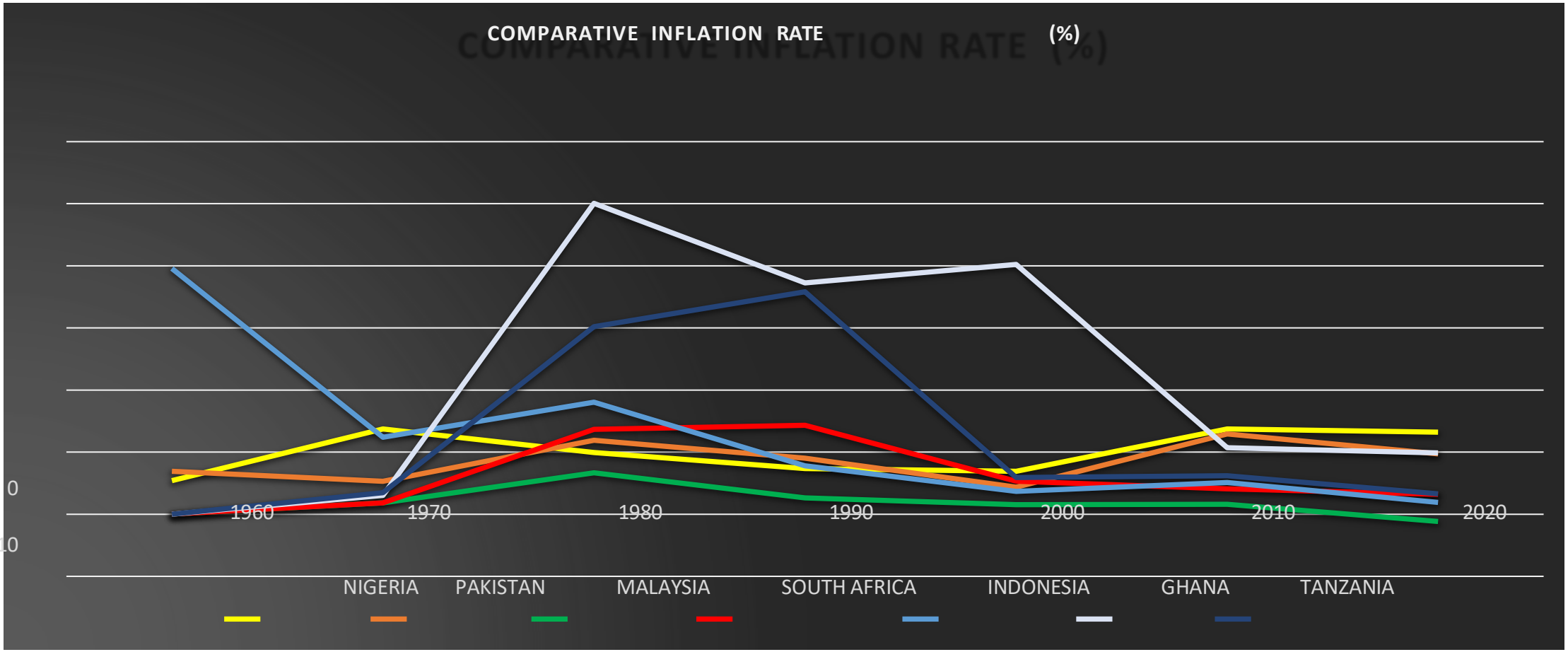


Data Source: World bank Development Reports

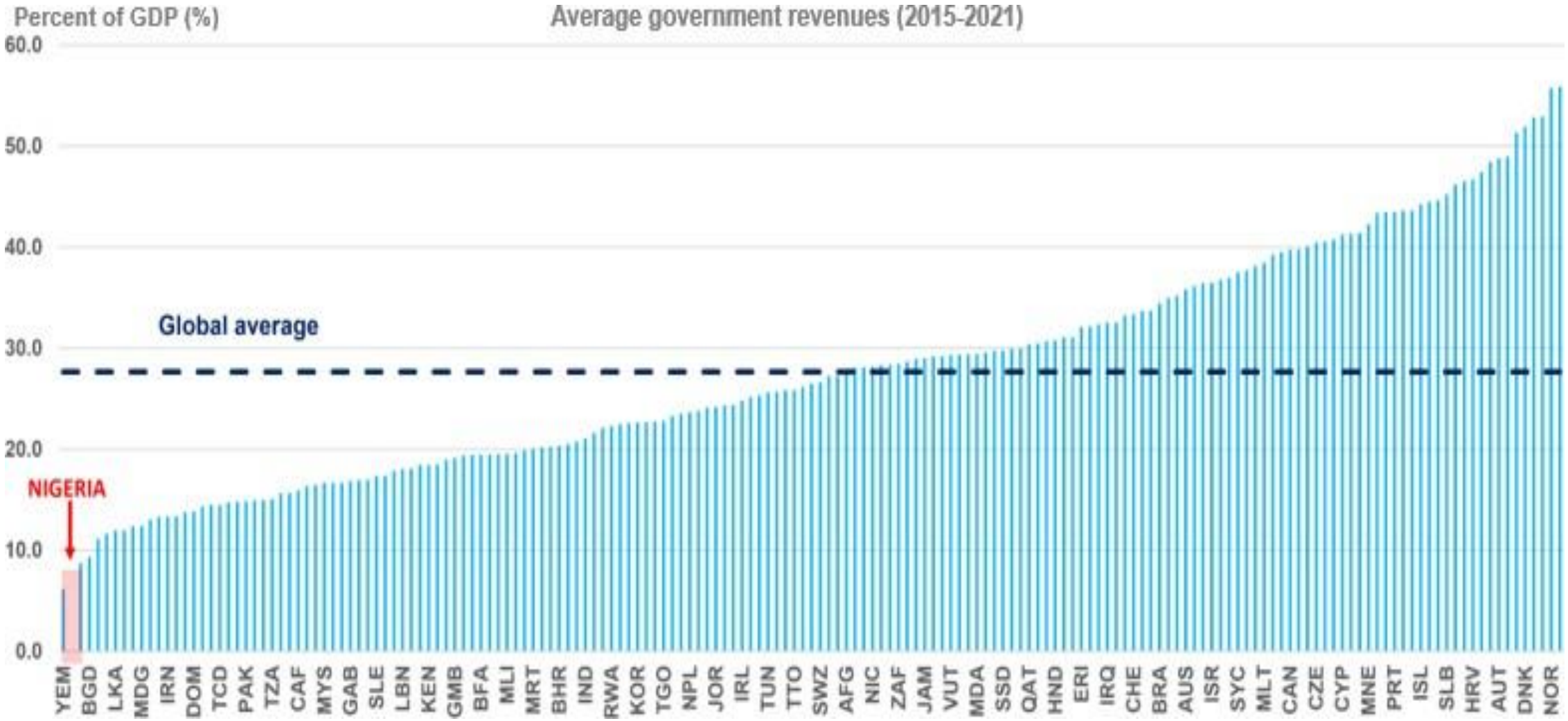

COMPARATIVE POPULATION (M)
300
250
200
150
100
50
0
1960
1970
1980
1990
2000
2010
2020

NIGERIA PAKISTAN MALAYSIA SOUTH AFRICA INDONESIA GHANA TANZANIA

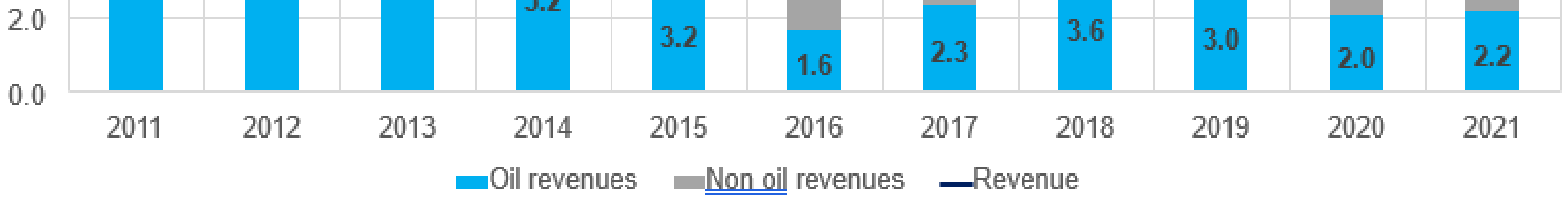
Data Source: United Nations – World population prospects


COMPARATIVE INFLATION RATE (%)
60
50
40
30
20
10
0
-10
1960
1970
1980
1990
2000
2010
2020
NIGERIA
PAKISTAN
MALAYSIA
SOUTH AFRICA
INDONESIA
GHANA
TANZANIA

Data Source: World Bank Development Reports



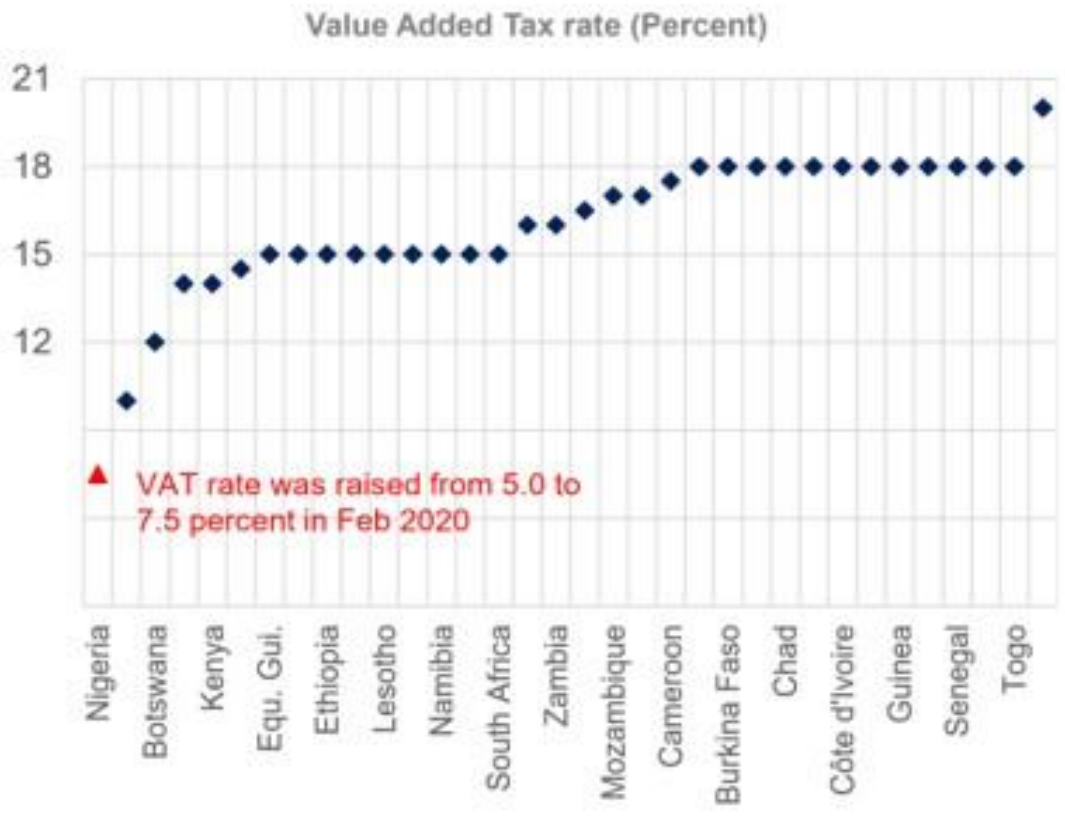
Source: WB Public Finance Review, Nov 2022



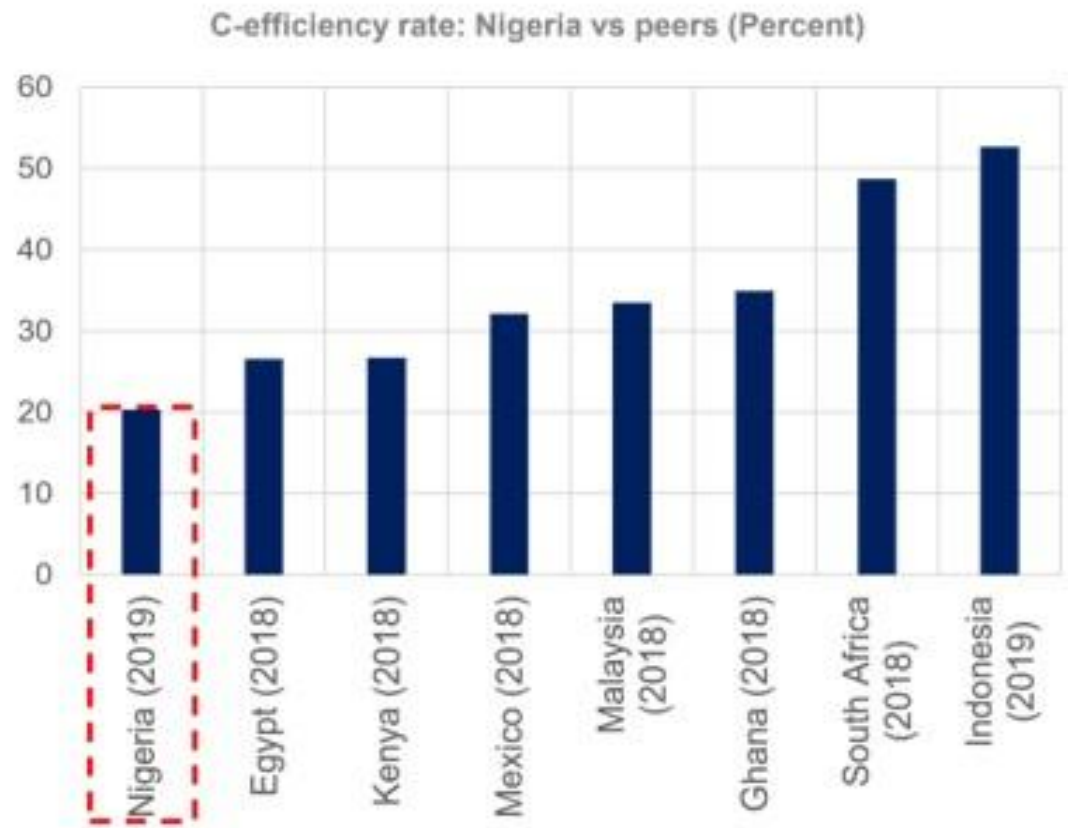
Source: WB Public Finance Reviewed, Nov 2022

…LOW TAX REVENUE IS ALSO DUE TO LOW TAX RATES (EVEN AFTER RECENT REFORMS) AND INEFFICIENCIES IN ADMINISTRATION

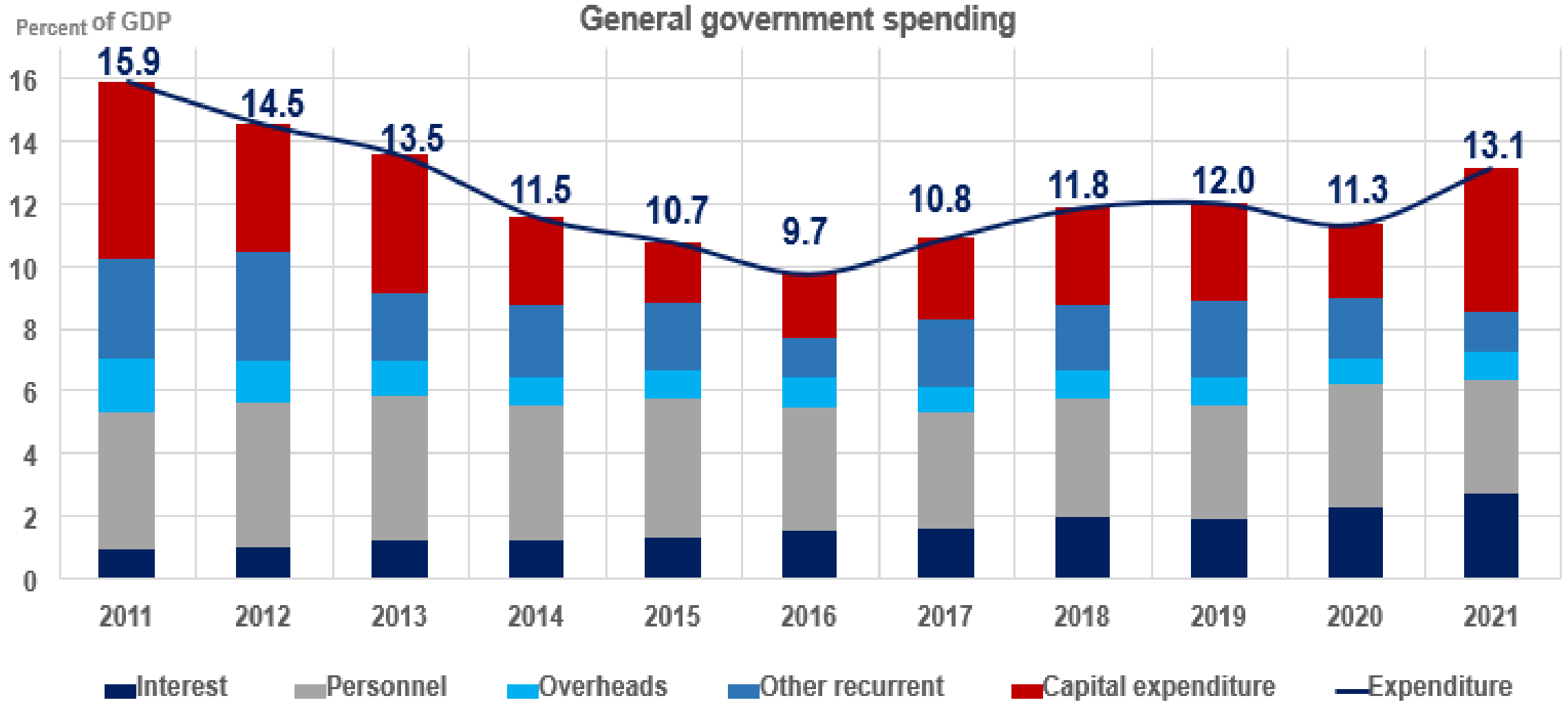
The VAT rate is the lowest in SSA…



… and its collection is not very efficient



Source: WB Public Finance Reviewed, Nov 2022



Source: WB Public Finance Review, Nov 2022.

CLOSING THE INFRASTRUCTURE GAP

- Nigeria has large infrastructure gap estimated at between US$2-3 trillion
- Power and Transport the two most important > 50%
- Existing level of government spending insufficient: would take 300 years at current level of government investment.
- Borrowing more is not solution.
- Increase government revenue and spend better
- Increase private investment and increase public thrust
- Improve governance arrangements

TRANSPORT CONTRIBUTION TO GDP

	1995	2000	2005	2010	2015	2020	2021
GDP	3,100.24	7,062.75	23,121.88	55,469.35	95,177.74	154,252.32	176,075.50
Total Contribution To GDP- Transport and Storage	208.58	246.35	495.13	694.77	805.46	823.47	957.3
% of GDP	**6.73**	**3.49**	**2.14**	**1.25**	**0.85**	**0.53**	**0.54**

Source: CBN

POPULATION TREND & TRANSPORT DEMAND

Increasing demand for travel, to and within diverse locations (rural, inter-city, and urban) typified by:

- Inadequate rural and access contributes to rural poverty and inequalities; high food cost.
- Low quality inter-city transport services = high road crash levels, high transport costs, increased cost of exporting and importing activities.
- Mismatch between urban transport demand & supply, poor service qualities and high proportion of income spent on travel, especially by the urban poor; formal public transport services subsidised.

NEEDED TRANSPORT AND LOGISTICS AGENDA

Overarching agenda is to improve its:

- ✓ Adequacy
- ✓ Safety
- ✓ Reliability
- ✓ Integration
- ✓ Comfort and Convenience
- ✓ Efficiency
- ✓ Affordability; and

Sustainability, both economically and environmentally(climate change infrastructure resilience, inclusiveness, etc)

5. RECOMMENDATIONS

SORRY, NO ROCKET SCIENCE!!!

SPECIFIC TO IMPROVING LOGISTICS SYSTEM

Achieve its economic and safety regulation for fair and equitable provision of services regarding pricing and quality of services. Quality and quantity licensing.

i. Improve organization of passenger & freight industry for intermodal operations.

ii. Facilitate acquisition of new vehicles using new technologies (reduced operational costs, improve safety and reduce adverse environmental impacts)

i. Facilitate adoption by the industry of innovation and operational practices in line with international good practices.

iv. Improve compliance by service providers with extant laws and regulations.

Sector Regulation: Areas for Immediate Focus

- Ensuring fair competition between the different modes (road, rail and inland water);
- Establishing a good framework for M and E of introduced regulatory measures to ensure timely needed adjustments;
- An accountability framework to allow for appeals and review of proposed regulatory measures;
- An industry specific consultative framework for use prior to major regulatory decisions;
- Improving safety of operations (provision and maintenance of infrastructure, vehicles, equipment, facilities, staff training, licensing and certification of operators, etc)

UNDERTAKE DIAGNOSTIC STUDY OF FREIGHT/LOGISTICS

TO IMPROVE NIGERIA'S TRANSPORT AND LOGISTICS

SYSTEM FOR DEVELOPMENT - 1

MACRO-ECONOMIC POLICY & ITS IMPLEMENTATION

- ❑ **To improve ability to carry out needed investment (public/private)**
- ❑ **Create Jobs and Improve Social Development**
- ❑ **Stimulate Demand and Supply and thus Sustainable Markets**

IMPORTANTLY: Develop Robust Transport Sector Financing Plan (Govt/Private/Users)

TO IMPROVE NIGERIA'S TRANSPORT AND LOGISTICS SYSTEM

FOR DEVELOPMENT - 2

APPROVE AND IMPLEMENT EXISTING POLICY RECOMMENDATIONS & PASS ENABLING LEGISLATION

- ✓ **Complete sector reform agenda**
- ✓ Professionalise FMOT supported by Aggressive Capacity Building.
- ✓ **Aggressively Promote Good Private Sector Participation**
- ✓ **Create a Transport Data Bank and Increase Research on Transport Matters.**

Consider merging FMOT and FHD into one ministry focused on policy formulation, legal and regulatory arrangements, resource mobilization and sector performance monitoring.

TO IMPROVE NIGERIA'S TRANSPORT AND LOGISTICS SYSTEM

FOR DEVELOPMENT - 3

PROMOTE DEVELOPMENT OF URBAN TRANSPORT AND URBAN LOGISTICS

- Declare both as Areas for Holistic Emergency Joint Actions by Federal, State, LGA.
- Establish Federal Agency for Coordination of Policy and Implementation
- Require States to establish single ministry for sector focused on policy, & an **autonomous urban transport agency** for planning and P.T. development.
- Develop Plan to Promote Efficient Urban Logistics: Lorry routes/ hub facilities

TRANSPORTATION AND LAND USE INTERRELATIONSHIP IN METROPOLITAN LAGOS: TOWARDS DEVELOPMENT STRATEGIES FOR MODERN TRANSPORTATION INFRASTRUCTURE

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PMB 2002, Ago-Iwoye, Ogun State, Nigeria.

Abstract: *The relationship between transportation and land use has been widely studied, but the specific role of inland waterways in shaping urban development in Lagos, Nigeria, remains underexplored. This study investigates the interrelationship between land use changes and inland waterway transportation in metropolitan Lagos over a 30-year period (1990-2020). Using Geographic Information Systems (GIS) and Remote Sensing techniques, land use and land cover (LULC) changes were analyzed through maximum likelihood supervised classification, while Pearson correlation analysis was applied to assess the relationship between land use changes and inland waterway passenger ridership across ten selected jetties. Findings reveal a 23% increase in built-up areas and a 24% decline in vegetation cover, demonstrating the rapid urban expansion and environmental transformation occurring in Lagos. A statistically significant positive correlation ($r = 0.716$, $p = 0.020$) between inland waterway passenger ridership and land use change highlights the growing role of waterways in urban development. The study recommends integrating inland waterways into Lagos' transportation and urban planning strategies, including the development of modern ferry terminals at strategic locations and improved multimodal transport connections, to enhance mobility options, reduce road congestion, and promote sustainable urban growth.*

Keywords: Land Use, Transportation, Urban Morphology, Inland Waterways, Lagos

1. INTRODUCTION

Transportation and land use are two interconnected systems that shape the spatial structure and functional dynamics of cities. The relationship between transportation infrastructure and land use has long been a focus of urban planning and development. Land use and urban morphology significantly impact transportation infrastructure by influencing traffic patterns, accessibility, economic activity, residential locations and overall urban growth (Levinson & Krizek, 2017). Effective integration of land use planning with transportation systems ensures efficient mobility, reduces congestion, and supports sustainable urban growth, creating well-connected and functional urban environments**.** In many developing countries, including Nigeria, rapid urbanisation and lagging development of transport systems present a unique set of challenges,

exacerbated by a lack of integrated land use and transportation planning, which results in inefficient urban growth, congestion, and environmental degradation (Rodrigue, 2020).

Lagos, Nigeria's largest city, epitomes the complex interplay of transport and land use. With a population of more than 20 million, Lagos' transport infrastructure, particularly its road networks, has been unable to keep up with the city's rapid urbanisation and economic expansion (Adelekan et al., 2020). The city's reliance on road-based transportation has resulted in severe congestion, high vehicle emissions, and economic losses from traffic delays. This situation highlights the need for a more diverse transport system that can relieve road congestion and promote sustainable urban growth (Agunloye & Olatunji, 2021).

Inland waterways represent a largely underutilised mode of transportation in Lagos, despite the city's vast network of lagoons, creeks, and rivers. Historically**,** **w**ater transport played an important role in Lagos' early development, but it has since been overshadowed by the expansion of road infrastructure. Given the city's geographical and demographic characteristics, revitalising inland water transport offers a promising alternative for reducing traffic congestion and improving connectivity between different parts of the city (Akinbamijo et al., 2016). This transition necessitates a strategic approach to transport planning that integrates water transport with land-based modes, allowing for more efficient use of land and resources.

The bidirectional relationship between transportation and land use is well recognised in urban studies. As transportation infrastructure improves, so does accessibility to various parts of the city, which influences land use patterns such as the location of residential, commercial, and industrial activities (Cervero, 2016). Changes in land use, such as the construction of new housing estates or business districts, raise demand for transport services (Oyalowo, 2022). In Lagos, the lack of alignment between transportation planning and land use development has led to a disjointed urban structure, characterized by informal settlements, inadequate infrastructure, and sprawling urban growth (Fatai, 2021). These issues are compounded by a lack of investment in public transportation systems, particularly those that could complement the existing road network. The case of Lagos highlights the need for a multi-modal transportation system that incorporates inland waterways, road, and rail networks. Inland waterways, in particular, can reshape the city's urban morphology by boosting waterfront development, enhancing accessibility, and fostering compact, sustainable growth (Rodrigue, 2020). Cities like Amsterdam and Venice exemplify how water transport reduces congestion and improves land use management (Bertolini & Le Clercq, 2003).

However, the potential of inland waterways to influence urban land use patterns in Lagos has not been fully explored. Research is needed to understand how water-based transportation can be effectively integrated into the city’s broader transportation strategy and what impacts it may have on land use planning, particularly in terms of promoting sustainable development along waterfront

areas. Therefore, this study investigates the interrelationship between transportation and land use in Lagos metropolis, with a focus on the role of inland waterways in shaping urban morphology. By exploring how water transport can alleviate road congestion and promote sustainable land use, the study aims to develop strategies for modern, integrated transportation infrastructure in Lagos, ensuring that the city remains competitive, livable, and environmentally sustainable in the future.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 The Concept of Land use

Land use refers to the management and modification of natural environments into built environments such as settlements, agriculture, and recreation areas. It involves human activities that alter the landscape for economic, social, and environmental purposes (Turner et al., 2007). Land use patterns refer to the spatial distribution of various human activities on the landscape, shaped by socio-economic, political, and environmental factors. Urban land use typically includes residential, commercial, industrial, and recreational areas, which are influenced by factors such as population density and economic activity (Brown et al., 2005). Effective land use planning can reduce urban sprawl, promote resource efficiency, and improve overall quality of life (Bhatta, 2010).

2.1.2 Urban Growth

Urban growth refers to the expansion of cities both in terms of population and physical size, driven by factors such as economic development, migration, and industrialization. It involves complex processes that reshape the socio-economic and environmental landscapes of urban areas. Urban growth can lead to improved infrastructure and economic opportunities but often comes with challenges like congestion, pollution, and social inequality (UN-Habitat, 2020). Sustainable urban planning is crucial to mitigate these issues and promote balanced development. Key strategies include integrating green spaces, enhancing public transportation, and ensuring equitable access to resources (Angel et al., 2016).

2.1.3 Transportation Infrastructure

Transportation infrastructure encompasses the systems and networks facilitating the movement of people and goods, including roads, railways, airports, and ports. It plays a vital role in supporting urban growth by connecting communities and enhancing economic development. Effective infrastructure reduces travel time, promotes trade, and improves access to services. However, inadequate transport systems can lead to congestion, accidents, and pollution. Sustainable transportation infrastructure should prioritize efficiency, accessibility, and environmental impact to support long-term urban development (World Bank, 2019; Litman, 2021).

2.2 Theoretical Review

Urban Growth Theories

Urban growth theories provide insights into the spatial organization and expansion of cities, particularly in relation to

transportation and land use. The **Concentric Zone Model**, developed by Ernest Burgess, portrays urban expansion as concentric rings growing outward from a central business district (CBD), with each ring representing different land uses. The central zone is the most populated and economically vital, and as cities expand, transportation infrastructure like roads and railways is established to connect these zones, supporting urban growth (Pacione, 2009). In Lagos, the crowded central area and sprawling informal settlements align with Burgess' model, where inadequate transportation infrastructure struggles to keep pace with rapid growth. The **Sector Model**, proposed by Homer Hoyt, extends Burgess' concept by suggesting urban growth follows transportation corridors, forming wedge-shaped sectors from the CBD (Pacione, 2009). In Lagos, major highways and roads create development corridors, with high-value residential areas clustering along these routes, while industrial and lower-income areas are situated further from key infrastructure. The **Multiple Nuclei Model**, introduced by Harris and Ullman, posits that cities develop several centers or nuclei, rather than a single CBD, around significant infrastructure like transportation hubs or industrial parks (Hall, 2002). In Lagos, the rise of multiple commercial and industrial centers, such as Ikeja and Apapa, reflects this model, with these secondary centers influencing land use and urban development.

These models illustrate how cities develop over time due to economic, social, and environmental factors, highlighting the significant role of transportation infrastructure in this process. They elucidate the spatial dynamics of urban growth and the impact of transportation on these patterns. In Lagos, expanding and improving transportation systems, especially the often-overlooked inland waterways, could foster new growth trends. Revitalizing water transport, for instance, might boost waterfront development and alter land use patterns, similar to those outlined in the Sector and Multiple Nuclei Models.

2.3 Empirical Review

Alsharif et al., (2022) analyzed urban land use growth in the El Baha region (Saudi Arabia) using high-resolution Landsat 5, 7, and 8 satellite imagery from 1985 to 2021. Remote sensing techniques and GIS mapping were employed to classify LULCC via maximum likelihood classification. Markov cellular automata in Idrisi TerrSet predicted future urban growth from 2021 to 2047. Findings indicate significant socioeconomic development, with urban expansion replacing rangeland, forest, shrubland, and barren land. The study predicts urban growth of 2607 km2 by 2047, aiding future planning and management aligned with Saudi Vision 2030.

Similarly, Fatai, (2021) analysed urban expansion trends in Kosofe Local Government Area of Lagos Metropolis for 1995, 2000, and 2015 using Landsat imagery from the USGS. Supervised classification of the images shows a less than 20% increase in built-up areas between 1995 and 2000, with significant changes in bare ground, vegetation, and water bodies. By 2015, built-up areas had increased by over 40%, while bare ground, vegetation, and water bodies decreased to less than 60%. Overall, built-up areas grew by over 20%, and bare ground

decreased by 8%. The study recommends improved physical planning to manage uncontrolled urban expansion.

Additionally, Bala et al. (2018) conducted a study on road transport development and urban growth in Gombe Metropolis, revealing a significant increase in road network connectivity from 1996 through 2005 to 2014, positively affecting the pattern of urban growth in the study area. Furthermore, Okeke et al., (2021) demonstrated that improvements in road transportation facilities result in increased demand for land, leading to urban expansion.

Previous studies on transportation infrastructure and land use in Lagos often emphasizes road networks, neglecting the potential of inland waterways as a viable alternative for urban mobility. This study addresses this gap by exploring the underutilized role of water transport in reducing congestion, influencing urban morphology, promoting sustainable development and complement existing land-based infrastructure.

3.0 METHODOLOGY

3.1 Description of Study Area: Lagos Metropolis

Lagos State is located in Southwestern Nigeria, between Longitudes 2°42' and 3°42' East and Latitudes 6°22' and 6°52' North, covering an area of 3,475.1 km². The coastal plain region, with elevations below 650 meters, predominantly lies below 320 meters, making it susceptible to flooding and beach erosion. Approximately 22% of the state's area consists of creeks and lagoons. The metropolitan area now exceeds 15 million and is projected to become the world's third-largest city by 2050. The complex drainage system includes lagoons and waterways, covering 22% or 787 sq. km. of the state's territory (Ministry of Transport, 2019, Lagos State Government, 2022). The terrain of Lagos State is mainly comprised of freshwater and mangrove swamp forests, shaped by a double rainfall pattern that creates a wetland environment (LASG, 2019). The climate is wet equatorial, with annual rainfall exceeding 1800 mm and an average temperature of 27°C. The region experiences a rainy season from April to October and a dry season from October to March.

Lagos is a major hub for regional and global socio-economic and political activities. Despite being the smallest state in Nigeria, Lagos boasts the highest urban population. Seventeen of the twenty Local Government Areas (LGAs) are located within the metropolis, while twelve LGAs encompass riverine communities.

3.2 Research Design

This study adopts a mixed-method design within the context of exploring the impact of inland waterways transportation on the changing morphology of Lagos Metropolis, utilizing GIS analysis to conduct a decadal land cover analysis from 1990 to 2020. This design allowed for the examination of changes in land use and cover over the specified time in metropolitan Lagos.

3.3 Data Sources

The data for the study were collected on various land use/land cover (LULC) categories including vegetation cover, water

bodies, built-up areas, and open spaces/bare soil. Spatial data were sourced from satellite imagery and historical maps, ensuring accuracy and consistency in measuring the extent of each land use category over time. Secondary data sources included online journals, books, and government reports which are related to the study.

3.3 Data Collection Methods

The maximum likelihood classification method was employed for the supervised classification of land use and land cover. The study segmented the terrain into various land cover categories: "Vegetation," which includes agricultural lands, forests, and recreational areas; "Water Body," covering rivers, lakes, reservoirs, and oceans; "Built-Up Area," which is further divided into "Undeveloped Area" (including beaches, bare rocks, and quarries) and "Developed Area" (with buildings and structures for residential, commercial, and industrial use). The classified images were processed and refined using ENVI 5.3 software before producing the final Land Use/Land Cover (LULC) maps for analysis. The data on ferry ridership (number of passengers using ferry services) within Lagos metropolis were collected from Lagos State Waterways Authority (LASWA). Out of 41 functional jetties within the metropolis, ten (10) of them were purposefully sampled for the study. These includes Addax, Agbara, Agboyi Ketu, Badore, Bariga, Ebute Ero, Etegbin, Ijon, Mile 2 and Oke Ira Nla jetty.

3.4 Data Analysis

To analyze the collected data, a combination of Land Use/Land Cover (LULC) Analysis and Geographic Information Systems (GIS)/Remote Sensing techniques were employed. This facilitated the classification and quantification of different land use types, while GIS provided tools for mapping and spatial analysis. Remote Sensing was crucial for acquiring and processing satellite images to detect changes in land cover over the study period. Additionally, correlation analysis in Statistical Package for Social sciences (SPSS) was employed to test the relationship between landuse and inland waterway transportation at 5% confidence level.

4.0 FINDINGS

4.1 Decadal Analysis of Land use/ Land cover for 1990

The 1990 land cover classification as shown in figure 1 and table 1 revealed that vegetation was the predominant land cover type, accounting for 44% of the total study area. This indicates Lagos still retained substantial forested and agricultural land nearly 30 years ago. The built up area which includes the developed urban areas, comprising residential, commercial, and industrial lands accounted for 31% of land cover, concentrated in the urban core, while the undeveloped part or bare soil covered 5% of land. Finally, water bodies, which include rivers, lakes, and wetlands, occupied around 20% of the total land. The 1990 map and class proportions depict Lagos metropolis at an earlier phase when vegetation dominated over built-up lands. The expansion of the built up areas is proof that Lagos metropolis had considerable growth and development between 1990 and 2020.

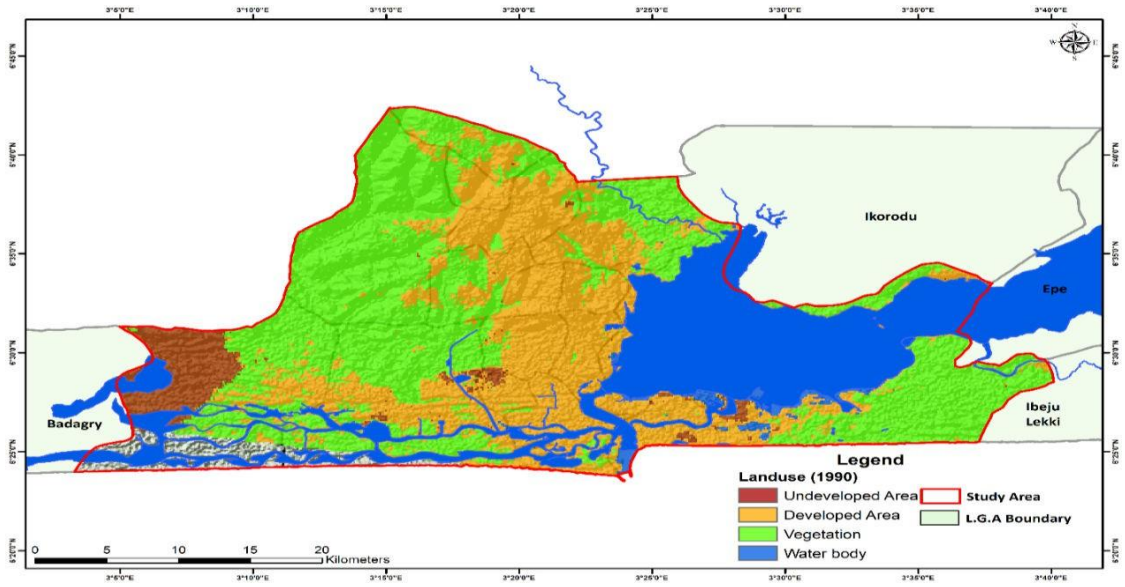

Figure 1: Land cover map of Lagos metropolis of 1990
Source: Author's GIS Analysis, (2023)

4.2 Decadal Analysis of Land use/ Land cover for 2000

The land cover classification for 2000 as shown in figure 2 and table 1 depicts Lagos approximately two decades ago and enables examination of land use changes during the 1990s. In 2000, vegetation covered 29% of Lagos' land, down from 44% in 1990, indicating urban expansion into forested and agricultural areas. Built-up areas comprised 28% of the land, with urban growth likely spreading outward from the city center. Undeveloped regions, like bare soil, rose to 23%, driven by land clearing for development. Overall, the built-up area grew from 35% in 1990 to 51% by 2000, while water bodies remained steady at 20%. These changes reflect Lagos' rapid urbanization during the decade.

In general, the 2000 land cover map and class statistics depict Lagos in an interim phase of development. While vegetation retained the largest share, alongside the growth of built-up areas, which expanded significantly, signaling a notable shift in land use and development patterns in Lagos metropolis. The 1990-2000 changes provide insights into early stages of Lagos's rapid urbanization over recent decades. It was a transitional period at the outset of high population and economic expansion. These dynamics led to development pressures on natural lands even by 2000.

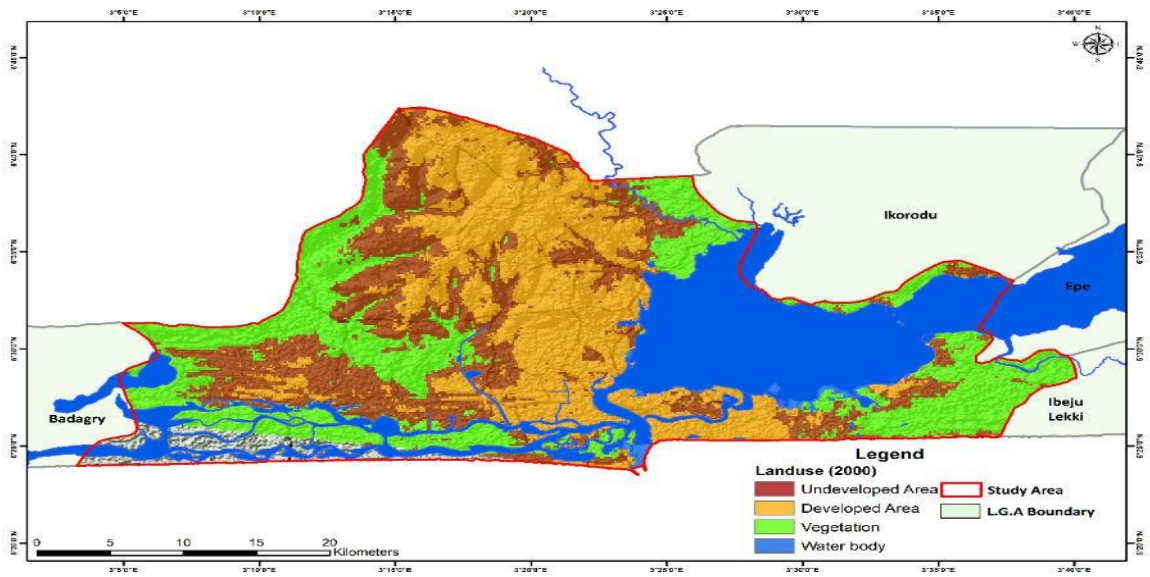

Figure 2: Land cover map of Lagos metropolis, produced from the supervised classification of Landsat TM image of 2000

4.3 Decadal Analysis of Land use/ Land cover for 2010

By 2010, there had been substantial changes to the composition of land use from 1990. Most significantly, developed area now made up 31% of the total land area. This shows that as Lagos saw fast urban growth and development between 2000 and 2010, the amount of built-up area used for residential, commercial, and industrial purposes increased significantly and exceeded the amount of vegetation. During this time, roads, housing colonies, commercial districts, and manufacturing probably destroyed large amounts of previously forested or agricultural terrain. By 2010, vegetation in Lagos had declined to 23%, a sharp drop from 44% in 1990 and 29% in 2000, highlighting the growing impact of development on green spaces. Undeveloped bare soil areas still accounted for 27%, while water bodies remained stable at 20% throughout the decades. The 2010 land cover data reflected Lagos' rapid urban development and expanding infrastructure.

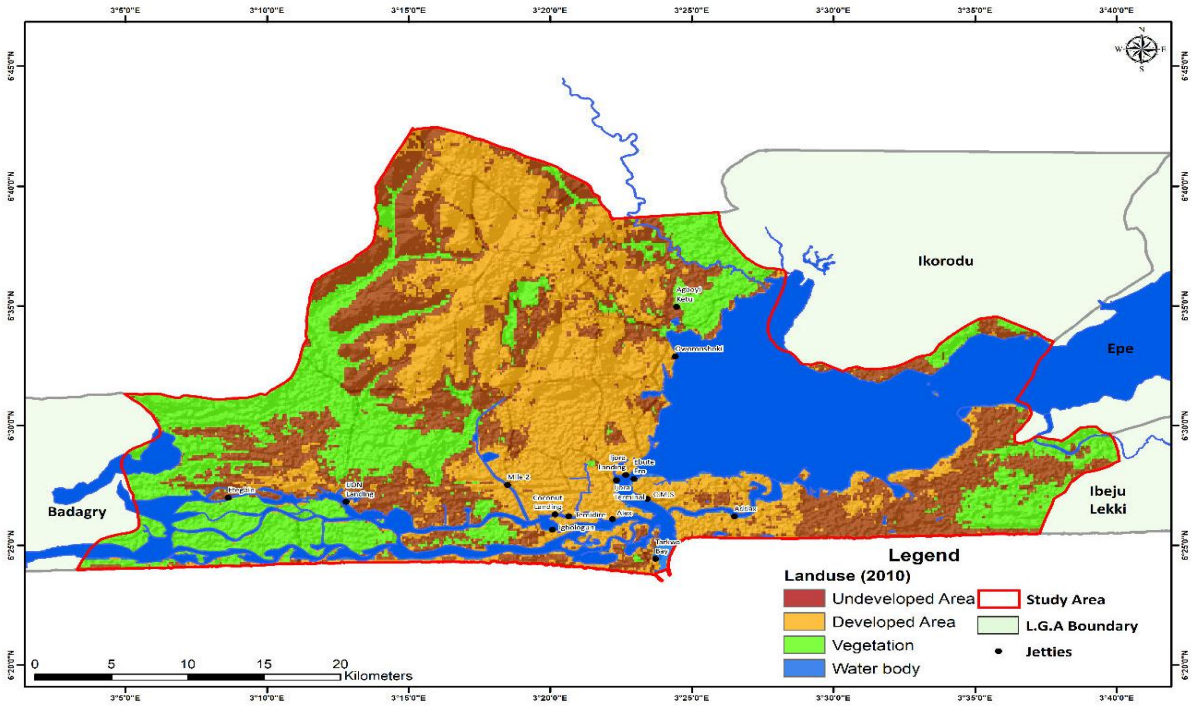

Figure 3: Land cover map of Lagos metropolis from the supervised classification of Landsat TM image of 2010

Source: Authors' GIS Analysis, (2023)

4.4 Decadal Analysis of Land use/ Land cover for 2020

The statistics and 2020 land cover map presented in Figure 4 and Table 1 paint an insightful image of the metropolitan Lagos's modern urbanised terrain, which is the result of decades of expansion and development. 36% of the built up land was covered by developed areas; this represents a significant change from the built environment that predominated in 1990, only thirty years ago. The overwhelming amount of structures, roads, amenities, and infrastructure erected throughout Lagos metropolis between 2010 and 2020 to meet the city's rapid population growth and economic expansion is reflected in the predominance of residential, commercial, and industrial built-up lands (Oyalowo, 2022). In just ten years since 2010, developed land in Lagos increased by nearly 15%, significantly reducing green spaces. From 1990 to 2020, vegetation cover dropped from 44% to 20%, marking a loss of over 50% of natural plant cover, farms, and forests. This trend highlights the strong development pressures transforming Lagos' landscape, where urban growth has displaced agricultural and open spaces. Now, only scattered patches of forest and flora remain amidst the city's extensive built-up areas and infrastructure. In 2020, aquatic bodies made up 21% of the land cover, a relatively stable amount despite the decline in vegetation. This is probably a result of engineering measures taken to preserve shorelines, ports, and navigable waterways in the face of increasing urbanisation, such as dredging and

reclamation. Land infilling occurred along coastal areas to increase developable area.

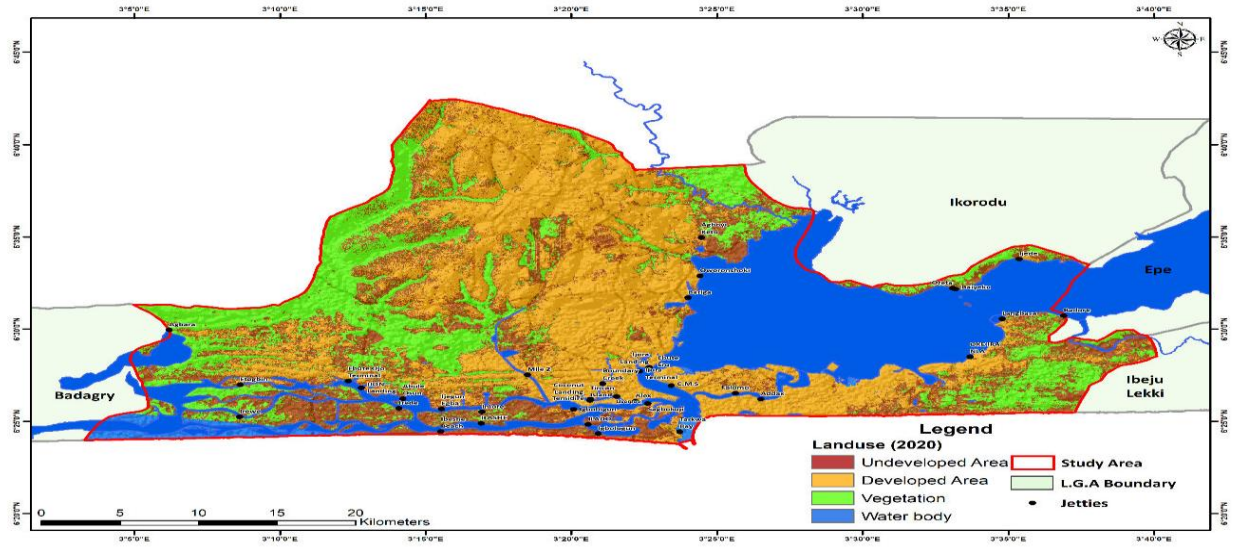

Figure 4: Land cover map of Lagos metropolis, produced from the supervised classification of Landsat TM image of 2020**, Source:** Author's GIS Analysis, (2023)

Table 1: Land cover statistics of Lagos from 1990 to 2020

Year		**1990**		**2000**		**2010**		**2020**	
Land cover classes		**Area (ha)**	**(%)**	**Area (ha)**	**(%)**	**Area (ha)**	**(%)**	**Area (ha)**	**(%)**
Water body		25,185.6	20	25,563.15	20	24,777.99	20	26,521.38	21
Vegetation		56,088.99	44	36,387.99	29	28,582.02	23	25,554.06	20
Built Up Area	Undeveloped Area	6,556.32	5	28,994.49	23	33,932.43	27	29,559.69	23
	Developed Area	38,986.02	31	35,871.3	28	39,524.49	31	45,181.8	36

Source: Author's Analysis, (2023).

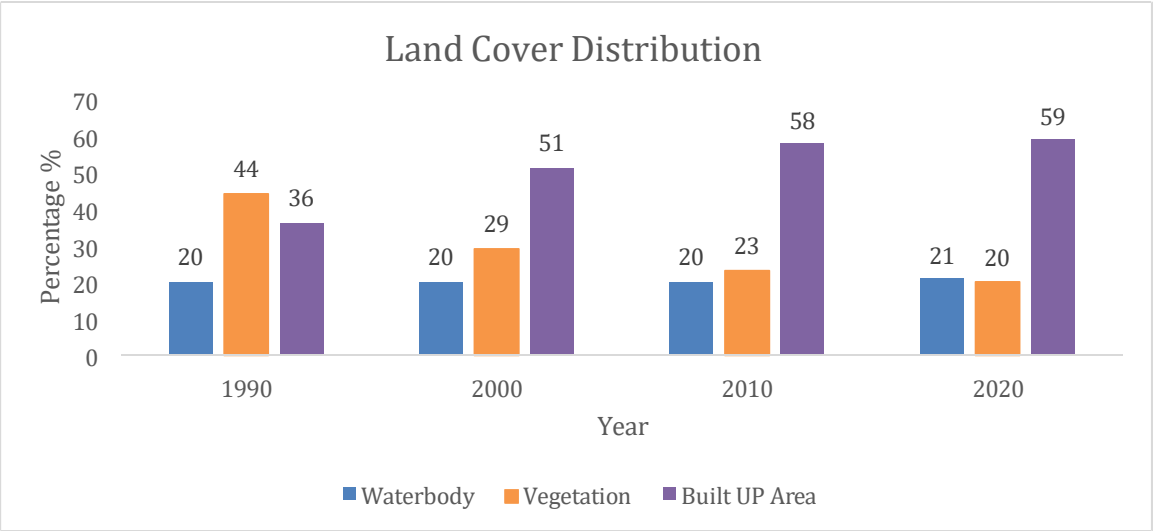

Figure 5: Land cover statistics of Lagos metropolis for 1990, 2000, 2010 and 2020
Source: Author's Analysis, (2023)

Several factors can contribute to an increase in the land cover classification of water bodies in Lagos metropolis, including urban flooding and drainage issues, such as inadequate drainage systems leading to water accumulation in low-lying areas and heavy rainfall exacerbating flooding (Adeloye & Rustum, 2011). Other factors include land reclamation, coastal development projects, natural and artificial wetland creation, water management and infrastructure projects, sea-level rise, deforestation, rapid urbanization, and environmental conservation efforts like mangrove restoration (Roy et al., 2023). The classification results highlight significant shifts in Lagos's different land cover classifications from 1990 to 2020. Lagos experienced significant land cover changes, with rapid urban expansion occurring at the expense of natural vegetation. Developed areas increased both in proportion and absolute size, transforming the landscape into a heavily built-up megacity. This 30-year shift in land use patterns provides key insights into Lagos' evolving urbanization.

4.5 Historical Land Cover Changes

With cumulative results for the whole research period from 1990 to 2020, Table 2 provides a thorough summary of land cover changes in Lagos metropolis over three different periods/phases: 1990 to 2000, 2000 to 2010, and 2010 to 2020. During the whole study period from 1990 to 2020, the built-up area expanded by 29,199.15 (23%) at an annual growth rate of 973.31 ha per annum. As the built area increases, the study result revealed a corresponding decrease in other land cover classes, especially vegetation. Vegetation declined by 30, 534.93 ha between 1990 and 2020, indicating a negative change of −24%. The historical land cover change result suggests both positive and negative changes observed among the different land cover classes in Lagos metropolis from 1990 to 2020.

Table 2: Area and percentage change of LULC in Lagos Metropolis during the different periods.

Land Cover Change									
Period		**(1990-2000)**		**(2000-2010)**		**(2010-2020)**		**(1990-2020)**		**Annual Change**
Land Cover Classes		**(ha)**	**(%)**	**(ha)**	**(%)**	**(ha)**	**(%)**	**(ha)**	**(%)**	**(ha)**
Water body		377.55	0	-785.16	0	1,743.39	1	1,335.78	1	44.53
Vegetation		-19,701.00	-15	-7,805.97	-6	-3.027.96	-3	-30,534.93	-24	-1,017.83
Built Up Area	Undeveloped Area	22,438.17	18	4,937.94	4	-4,372.74	-4	23,003.37	18	766.78
	Developed Area	-3,114.72	-3	3,653.19	3	5,657.31	5	6,195.78	5	206.53
	Total Built up Area	19,323.45	15	8,591.13	7	1,284.57	1	29,199.15	23	973.31

Source: Author's Analysis, (2023).

4.6 Relationship between land use and Inland waterway Transportation

The data on landuse change for developed areas in 2020 and the ferry ridership across the ten selected jetties is shown in table 3. The variance in land use as of 2020 was derived by computing the difference in landuse values for 2010 and 2020, revealing the landuse change over the past ten years. To examine the relationship between the passage of inland waterway transportation and landuse change, this data was subjected to correlation analysis and the result can be seen in Table 4. The correlation analysis revealed a person value of 0.716, with a significance level of 0.020 (N=10 jetties). Since the p-value is less than 0.05, the relationship is statistically significant. This indicates a strong, positive relationship between the two variables, suggesting that changes in land use are significantly associated with the passage of inland waterway transportation, through its demand, reflecting the number of passengers using the ferry service, which depends on factors like population density, connectivity, affordability, and the availability of alternative transportation options. The positive correlation value indicates that as land use changes, inland waterway transportation demand increases. This means that alterations in land use patterns are positively associated with the growth or improvement of waterway transport in the study area.

Table 3: Comparison of Developed Areas (ha) and Variances as of 2020 Across Selected Jetties, with Ferry Ridership Data for 2020.

Developed Area (ha)				Variances as of 2020		Ferry Ridership 2020
S/N	Jetties	2010	2020	(ha)	(%)	
1	Addax	2,881.35	3,482.55	601.2	5.36	243855
2	Agbara	2,262.69	2,657.97	395.28	3.52	218642
3	Agboyi ketu	3,338.28	4,748.49	1,410.21	12.57	507677
4	Badore	667.08	1,740.42	1,073.34	9.56	381202
5	Bariga	3,189.78	3,871.23	681.48	6.07	6335
6	Ebute ero	1,536.84	4,904.73	3,367.89	30.01	838747
7	Etegbin	2,139.48	2,811.15	671.67	5.99	325038
8	Ijon	2,541.24	2,974.86	433.62	3.86	482825
9	Mile 2	4,433.58	5,344.83	911.25	8.12	691292
10	Oke ira nla	1,979.19	3,654.81	1,675.62	14.94	520325
	TOTAL			11,221.56	100	

Source: Author's GIS Analysis, LASWA, 2023

Table 4: Correlation between Land use Analysis and Passage of Inland waterway Transportation in 2020

Variable	N	Pearson Correlation	Sig. (2-tailed)
Change in land use and Passage of Inland waterway transport	10	0.716 (*)	0.020

Source: Authors' SPSS Analysis, 2023

5.0 POLICY IMPLICATIONS AND RECOMMENDATIONS

The findings highlight the importance of transforming the transportation infrastructure in Lagos state and other Nigerian cities. By integrating modern ferry jetties into urban development, transportation options become diversified with improved waterway systems which can accommodate growing populations, increase mobility and promote sustainable development. This approach will not only enhance transportation efficiency but also provide residents with a variety of transport choices, ultimately improving the quality of life and urban resilience in Nigerian cities. From the findings the following recommendations were made:

i. There is need to implement comprehensive urban development strategies that align land use with

modern transportation infrastructure, including ferry jetties, to optimize mobility and enhance the efficiency of waterway transport.

ii. Well-designed ferry terminals should be established at strategic locations to support the growth of inland waterway transportation, improving connectivity and access for residents.

iii. Policies that support integrated transportation systems, combining land and water transport options should be encouraged to provide citizens with more diverse and convenient mobility choices.

iv. Transportation infrastructure should be developed within urban development plans to improve the quality of life by reducing traffic congestion and expanding transportation options.

6.0 CONCLUSIONS

The study concludes that Lagos metropolis has experienced significant urban expansion over the past three decades, with a 5% increase in built-up areas and a 24% decrease in vegetation. These shifts reflect rapid urbanization and morphological transformation. The positive correlation between land use and inland waterway transportation further highlights that as land use patterns change, waterway transport increases. As cities like Lagos continue to expand, modernizing waterway transport systems can alleviate road congestion, enhance mobility options, and promote sustainable urban growth, ultimately improving the quality of life for residents across the federation.

7.0 REFERENCES

Adeloye, A. J., & Rustum, R. (2011). Lagos (Nigeria) flooding and influence of urban planning. *Proceedings of the Institution of Civil Engineers - Urban Design and Planning*, *164*(3), 175–187. https://doi.org/10.1680/udap.1000014

Akinbamijo, O., Ipingbemi, O., & Bayode, T. (2016). In-land water based transport in Lagos State: Challenges and remedies. *Proceedings of the Joint International Conference (JIC) on 21st Century Human Habitat: Issues, Sustainability and Development* (pp. 825–831). Akure, Nigeria.

Alsharif, M., Alzandi, A. A., Shrahily, R., & Mobarak, B. (2022). Land Use Land Cover Change Analysis for Urban Growth Prediction Using Landsat Satellite Data and Markov Chain Model for Al Baha Region Saudi Arabia. *Forests*, *13*(10), 1530. https://doi.org/10.3390/f13101530

Bala, R., & Bibi, U. (2018). Road transport development and urban growth in Gombe metropolis, Gombe, Nigeria. *International Journal of Advanced Remote Sensing and GIS, 7*(1), 2675-2684.

Bertolini, L., & Le Clercq, F. (2003). Urban transport and land use strategies for a sustainable future: Lessons from Europe. *Journal of Urban and Regional Planning*, 27(2), 187-201.

Brown, D. G., Johnson, K. M., Loveland, T. R., & Theobald, D. M. (2005). Rural Land-use Trends in the

Conterminous United States, 1950-2000. *Ecological Applications*, 15(6), 1851-1863.

Burgess, E. W. (1925). The growth of the city: An introduction to a research project. In R. E. Park, E. W. Burgess, & R. D. McKenzie (Eds.), *The city* (pp. 47-62). University of Chicago Press.

Cervero, R. (2016). Transport infrastructure and the evolution of cities. *Journal of the American Planning Association*, 67(3), 234-250.

Duranton, G., & Turner, M. A. (2012). Urban growth and transportation. *The Review of Economic Studies, 79*(4), 1407-1440. https://doi.org/10.1093/restud/rds010

FAO. (2017). *The Future of Food and Agriculture – Trends and Challenges*. Food and Agriculture Organization of the United Nations.

Fatai, A. O. (2021). Analysis of urban expansion and land cover changes in Lagos Metropolis, Nigeria. *FUTY Journal of the Environment*, 15(2), 59–71.

Hall, P. (2002). *Cities of tomorrow: An intellectual history of urban planning and design in the twentieth century* (3rd ed.). Wiley-Blackwell.

Harris, C. D., & Ullman, E. L. (1945). The nature of cities. *Annals of the American Academy of Political and Social Science*, 242(1), 7-17.

Hoyt, H. (1939). The structure and growth of residential neighborhoods in American cities. *Federal Housing Administration*.

Lagos State Government. (2022). *About Lagos*. Lagos State Government. https://lagosstate.gov.ng/about-lagos/

Levinson, D., & Krizek, K. J. (2017). The end of traffic and the future of transport: Lessons from the last fifty years and future prospects. https://transportist.org/wp-content/uploads/2017/10/eotfoa-preview.pdf

Okeke, F. O., Gyoh, L., & Echendu, I. F. (2021). Impact of Landuse Morphology on Urban Transportation. *Civil Engineering Journal*, *7*(10), 1753–1773. https://doi.org/10.28991/cej-2021-03091758

Oyalowo, B. (2022). Implications of urban expansion: land, planning and housing in Lagos. *Buildings and Cities*, *3*(1), 692–708. https://doi.org/10.5334/bc.243

Pacione, M. (2009). *Urban geography: A global perspective* (3rd ed.). Routledge.

Rodrigue, J. P. (2020). *The geography of transport systems* (5th ed.). Routledge.

Turner, B. L., Lambin, E. F., & Reenberg, A. (2007). The Emergence of Land Change Science for Global Environmental Change and Sustainability. *Proceedings of the National Academy of Sciences*, 104(52), 20666-20671

PROVISION AND MAINTENANCE OF ROAD INFRASTRUCTURE IN URBAN AREAS: A CASE STUDY OF ASABA METROPOLIS, NIGERIA

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Abstract

This paper presents a review of road infrastructure provision and maintenance in Asaba, focusing on the factors that contribute to road deterioration and ongoing flooding in the city, despite flood control projects in critical areas. The study also investigates the impact of the government's failure to implement effective interventions. Data was collected through a review of relevant literature and on-site inspections of commonly flooded areas. The findings indicate that drainage systems are often poorly constructed or completely overlooked during initial road construction, resulting in inadequate drainage solutions during later road rehabilitation. The paper offers recommendations for best practices in road infrastructure provision and maintenance to promote sustainable urban development in Asaba.

Keywords: Road Infrastructure, Maintenance, Sustainable Development, Asaba

Introduction

Infrastructure is essential for nearly all human activities, with both developed and developing countries relying heavily on it for their social and economic functions (Emeasoba and Ogbuefi, 2013). To enhance understanding, it is important to define infrastructure in this paper. According to Kararach (2014), infrastructure refers to facilities, structures, associated equipment, services, and institutional arrangements that enable the exchange of goods and services among individuals, businesses, and governments. This includes public utilities such as roads, railways, ports, waterways, and airports, as well as the provision, operation, and maintenance of these physical facilities.

Road infrastructure plays a crucial role in the development and sustainability of urban areas, serving as the backbone for economic activities, social interaction, and overall mobility. In rapidly urbanizing regions, the quality, availability, and maintenance of road networks are essential factors that determine the efficiency of transportation, the ease of access to essential services, and the general well-being of the population. As urban populations grow, so too does the demand for robust and well-maintained road infrastructure, which must accommodate increasing traffic volumes, support economic activities, and ensure the safety and comfort of all road users.

When considering all these elements, transport infrastructure can be broadly understood to encompass not only the provision, operation, and maintenance of transport facilities but also the institutional arrangements for organizing the transport sector (Newman, 2013). This definition also extends to include road furniture as part of road infrastructure, which helps clarify the scope of this paper, focusing on road transport infrastructure provision and maintenance. Road infrastructure is a fundamental and critical element

that drives development in any economy. Road networks provide access to employment, healthcare, and education services, all of which are vital to any development agenda (World Bank) (Jackson, 2020). Without adequate road infrastructure and maintenance, issues such as traffic congestion, safety hazards, inefficient travel, loss of productivity, increased costs of mobility, and frequent accidents will continue to escalate (Singh, 2012).

By international standards, the road network in Nigerian cities, with the exception ofAbuja— a modern city with well-developed roads and pedestrian walkways an be considered poor (Onokola, 2015)). Nigerian city roads share common issues with other African cities, where a significant percentage consists of poorly maintained, flood-prone single-lane roads due to inadequate drainage systems. This situation limits capacity in most cities, with the absence of service lanes further straining the existing infrastructure. Poor road conditions and limited capacity reduce vehicle speeds, cause traffic congestion, decrease productivity across all vehicle types, and increase vehicle maintenance costs (Afrin & Yodo, 2020).

It is noteworthy that in 1995, Nigeria's road network was estimated to have an asset nominal replacement value of nearly 20 billion US dollars. The annual losses due to poor road conditions were valued at N80 billion, with additional vehicle operating costs resulting from bad roads at N53.8 billion, bringing the total annual loss to N133.3 billion (Adetunji, 2014)). These figures do not account for the hours lost in traffic, nor the physical and psychological stress endured by road users during their journeys (Adetunji, 2014).

Sustainable road maintenance is essential to protect road investments, ensure the efficient use of roads, provide safe and comfortable journeys for users, and minimize disruptions for those living and working near roads. Maintenance helps extend the longevity and sustainability of road infrastructure.

According to the Federal Ministry of Works, road maintenance involves preserving and keeping road structures as close as possible to their original condition. This includes addressing deficiencies resulting from poor design, aging, usage, and environmental factors, and taking steps to prevent or delay further deterioration (Ipingbemi, 2008). The primary goal of maintenance is to preserve the asset, not upgrade it, and it includes minor repairs and improvements to eliminate the causes of defects and avoid repetitive maintenance efforts. For management and operational purposes, road maintenance is categorized into routine, periodic, and urgent maintenance.

Routine maintenance consists of small-scale, regular activities aimed at ensuring the short-term safety of existing roads and preventing premature deterioration. Typical tasks include clearing roadside vegetation, cleaning silted ditches and culverts, patching potholes, and sealing cracks (Emesasoba et a1., 2013). Periodic maintenance involves larger-scale activities on specific road sections at regular, relatively long intervals to preserve the road's structural integrity (Adane, 2021). These operations require specialized equipment, skilled personnel, and careful planning. Urgent maintenance addresses unforeseen repairs that need immediate attention, such as collapsed culverts, fallen trees, and broken-down vehicles.

Urbanization is rapidly occurring worldwide, particularly in developing countries, leading to increased demands on infrastructure. Nigeria's urbanization rate was once ranked among the highest in the world (Jiboye et a1., 2020). By 1988, over 30% of the country's population lived in urban centers with populations of 100,000 or more, and by 2000, this proportion was expected to rise to 50% (Jiboye et a1., 2020). This trend reflects a growing concentration of people in urban areas, where development is concentrated.

As urban populations grow exponentially, the traffic environment becomes more complex, and travel demand increases. It is crucial to provide adequate road infrastructure, particularly in urban areas, to accommodate the growing population. Existing road infrastructure must be maintained at all times. An overview of intra-city movement in Nigeria reveals that over 80% of urban trips are made by road, with short distances often covered on foot and longer distances by public transport (Adetunji, 2014; Jiboye et a1., 2020). Unfortunately, the design of urban transport routes in Nigeria often fails to account for pedestrian walkways and other essential transport facilities such as street lights, flyovers, and drainage systems, which are vital for facilitating the movement of people, goods, and information within cities. Adequate provision of these road transport facilities ensures the free flow of vehicular traffic and guarantees the safety of pedestrians and other road users.

According to Akpoyibo et a1 (2022), the Delta State Ministry of Works undertook the construction, reconstruction, rehabilitation, and maintenance of 193 road projects, covering over 732 kilometers of road and 229 kilometers of concrete-lined drains across the state between May 2015 and March 2018, at a cost of over N122 billion. Unfortunately, some areas in the Asaba metropolis do not align with design specifications, posing risks to the users of these facilities. It is against this backdrop that this paper examines road transport infrastructure provision and maintenance in Nigerian urban cities, with a focus on the Asaba metropolis.

This study focuses on the provision and maintenance of road infrastructure in Asaba Metropolis, the capital of Delta State, Nigeria. Asaba is strategically positioned as a gateway between various regions of the country, making its road infrastructure critical not only for local development but also for regional connectivity. Despite its strategic importance, Asaba, like many other urban areas in Nigeria, faces challenges related to inadequate road infrastructure and poor maintenance, which can hinder economic growth, exacerbate traffic congestion, and contribute to safety hazards.

By examining the current state of road infrastructure in Asaba, this study aims to assess the adequacy of road provisions and the effectiveness of maintenance practices. The findings from this study will provide insights into the strengths and weaknesses of the existing road network and offer recommendations for improving road infrastructure and maintenance strategies in Asaba Metropolis. Through this case study, the research seeks to contribute to broader discussions on urban infrastructure development in Nigeria and other similar contexts.

Methodology

Asaba, the capital of Delta State, Nigeria, is strategically positioned on the western edge of the Niger River, directly across from Onitsha, with the Niger Bridge serving as a vital link between the two cities. A rapidly developing urban area, Asaba had a population of 149,603 according to the 2006 census, with an estimated metropolitan population exceeding half a million people by 2016 (Samuel, 2023).

Geographically, Asaba is located on a terrace of the lower Niger River, acting as a crucial connector between western, eastern, and northern Nigeria. This connectivity is facilitated by the Niger River from the north and the Asaba Niger Bridge, which serves as an east-west corridor. Asaba lies approximately 6° north of the equator and an equal distance east of the meridian, about 160 kilometers north of the point where the Niger River meets the Atlantic Ocean. The greater Asaba area spans approximately 300 square kilometers.

Key transportation routes in Asaba include the Asaba-Benin express road, which links eastern and western Nigeria, as well as roads connecting Asaba with Ughelli and the Asaba-Ebu road that links the city with northern Nigeria. For this study, both primary and secondary data sources were utilized. The primary data were collected through on-site inspections of selected roads within the metropolis. These inspections focused on evaluating the availability and functionality of road infrastructure, including road furniture and drainage systems, as well as assessing the condition of the road surfaces on the sampled routes.

In Asaba, roads from different categories—Trunk A (Federal Roads), Trunk B (State Roads), and Trunk C (Local Government Roads)—were strategically and randomly selected to assess road infrastructure provision and maintenance. The selection criteria included high road usage, traffic volume, and susceptibility to flooding. The specific roads examined were Nnebisi Road, Summit Road to Inte-bau, Anwai Road to Campus, Asaba-Benin Road, and Ibusa Road from Koka junction to the intersection with Nnebisi Road. Secondary data were gathered from Delta State Government online archives and newspapers to complement the primary data.

Result

The evaluation of road infrastructure in Asaba, as detailed in Table 1, reveals varying levels of provision and quality across key roads. Nnebisi Road, a dualized route, is equipped with drainage on both sides, functional street lights, and adequate road signs and markings. However, it lacks a designated parking space and bus stops, which could pose challenges for traffic management and safety. The walkways on this road are incorporated into the covered drainage system, which is efficient but may limit pedestrian space.

Anwai Road, particularly the stretch from Summit Junction to Inte-bua, is also dualized and in good condition, with partial drainage, functional street lights, and adequate road signs, markings, and a designated parking space. The road is well-furnished, with all necessary infrastructure in place. However, the section from Inte-bau to Campus, although similarly dualized and well- maintained, suffers from inadequate bus stops and walkways, which could impede accessibility and pedestrian safety. Despite these shortcomings, the road signs and markings are sufficient, and a designated parking space is provided.

On the other hand, Asaba-Benin Road presents more significant challenges. While drainage and street lights are available, parts of the road are in poor condition, and essential features such as bus stops, adequate road markings, and a designated parking space are missing. The lack of these critical elements highlights the need for substantial infrastructural improvements on this busy route. Similarly, Ibusa Road, which is dualized from Koka Junction, faces issues with incomplete drainage coverage, especially near Winners' Chapel. The absence of bus stops, walkways, and designated parking spaces further compounds the challenges on this road, though the road signs and markings are generally sufficient.

Table 1: Provision of Road Structure

S/N	Selected Road	Road Width	Drainage	Street Lights	Bus stop	Walkway	Road Sign	Road Marking	Designated Parking
1.	Nnebisi Rd.	Dualised; and can accommodate smaller vehicle at a time	Available on both sides	Available	Not available	Available (covered drainage is used as walkway)	Available Adequate	Available Adequate	No
2.	Anwai Rd. from summit junction to Inte-bua	Good Dualised	Partial drainage	Available	Available	Available	Available Adequate	Available Adequate	Yes
3.	Anwai Rd. Inte-bau to campus	Good DllaliSed	Available on both sides	Available Inadequate	Available Inadequate	Available	Available	Available	Yes
4	Asaba-Benin Rd	Some sections of the road are bad	Available on both sides	Available	Not available	Available	Inadequate	Not available	No

5.	Ibusa Rd (from Koka joncti on to th e interc ept at Nnebi si Rd)	Dualised from Koka Junction to intercept of Ibeh way	Availabl e on both sid es from fro m Koka junction to Winners ' Chapel; unavaila ble 500m away from Winners ' Chapel)	Availab le	Not availabl e	Not availabl e	Inadequa te	Availab le	No

The maintenance status of the roads, as shown in Table 2, underscores the varying degrees of upkeep across Asaba's road network. Nnebisi Road and the initial section of Anwai Road from Summit Junction to Inte-bua are in good condition, with functional street lights and clear road signs and markings. However, the drainage systems on these roads are silted, which could lead to flooding and other drainage issues if not regularly cleared. The subsequent stretch of Anwai Road from Inte-bau to Campus is similarly well-maintained, but the recurring issue of silted drainage is evident here as well. While the road surface remains good and street lights functional, the effectiveness of the drainage system is compromised, potentially affecting road safety during heavy rainfall.

Asaba-Benin Road stands out as particularly problematic, with a poor road surface, silted drainage, non-functional street lights, and faded road signs and markings. These deficiencies indicate a significant neglect of maintenance, which not only deteriorates the road's condition but also poses risks to road users. Ibusa Road, while in fairly good condition, shares similar issues with silted drainage and non-functional street lights. The road markings are also faded, which could lead to confusion and accidents, especially at night or during adverse weather conditions.

Table 2: Maintenance of Road Structure and Furniture

S/N	**Selected Road**	**Road Surface**	**Drainage**	**Street Lights**	**Road Sign**	**Road Marking**
1.	Nnebisi Rd.	**Good**	Silted	Functional	Clear	Clear
2.	Anwai Rd. from Summit junction to lute-bua	Good	Silted	Functional	Clear	Clear
3.	Anwai **Rd. Inte-bau** to campus	**Good**	**Silted**	Functional	Clear	Clear
4.	Asaba-Benin Rd	Bad	Silted	Not functional	Faded	Faded
5.	Ibusa Rd (from Koka junction to the intercept at Nnebisi Rd.)	Fairly good	Silted	Not functional	Good	Faded

The analysis of road infrastructure in Asaba highlights a mix of well-maintained and poorly maintained roads. While roads like Nnebisi Road and sections of Anwai Road are adequately equipped and maintained, others, particularly Asaba-Benin Road, require urgent attention. Common issues such as clogged drainage systems, non-functional street lights, and faded road markings are prevalent, especially on roads with high traffic and flood susceptibility. The absence of designated parking spaces and bus stops on many roads further exacerbates traffic and safety challenges. These findings suggest a need for targeted improvements in both infrastructure provision and maintenance, particularly on critical roads like Asaba-Benin Road and Ibusa Road, to enhance overall road safety and functionality in the city.

Discussion

The assessment of road infrastructure in Asaba, as detailed in the tables, reveals significant disparities in the provision and maintenance of road structures and furniture across the city. The findings indicate that while some roads, such as Nnebisi Road and parts of Anwai Road, are relatively well-equipped and maintained, others like Asaba-Benin Road and Ibusa Road show clear signs of neglect and inadequate infrastructure. These disparities have important implications for traffic management, road safety, and urban development in Asaba.

Nnebisi Road stands out as a well-structured and adequately furnished road, with functional drainage, street lights, and clear road markings. However, the lack of designated parking spaces and bus stops is a critical oversight, potentially leading to traffic

congestion and safety hazards, especially in busy urban areas. Similarly, Anwai Road, particularly the stretch from

Summit Junction to Inte-bua, is well-provisioned but shares the same deficiencies. The inadequacy of bus stops and pedestrian walkways on some sections of Anwai Road could limit accessibility and safety for pedestrians, indicating a need for more comprehensive urban planning that caters to both vehicular and pedestrian traffic.

In contrast, Asaba-Benin Road and Ibusa Road are poorly provisioned in several key areas. The absence of critical infrastructure such as designated parking spaces, bus stops, and walkways on these roads is alarming, given their importance as major traffic routes. The lack of adequate road markings on Asaba- Benin Road further exacerbates the safety risks, particularly for night-time driving and during adverse weather conditions. These findings suggest that the infrastructure provision on these roads has not kept pace with urban growth and the increasing demands of road users, highlighting a significant gap in urban infrastructure planning and implementation.

The maintenance of road infrastructure also presents a mixed picture. While roads like Nnebisi Road and the Summit Junction to Inte-bua stretch of Anwai Road are generally well-maintained, with functional street lights and clear road signs, the pervasive issue of silted drainage systems across these roads is concerning. Silted drainage not only reduces the effectiveness of flood management but also increases the risk of road damage and accidents during heavy rainfall. This recurring issue across multiple roads suggests that maintenance efforts are either insufficient or inadequately targeted, potentially undermining the long-term sustainability of road infrastructure in the city.

Asaba-Benin Road, in particular, emerges as a critical area of concern. The road's poor surface condition, coupled with silted drainage, non-functional street lights, and faded road markings, points to a severe lack of maintenance. These deficiencies not only compromise road safety but also reflect broader issues in the management and allocation of resources for infrastructure upkeep. The situation on Ibusa Road, while slightly better, still reveals significant maintenance lapses, particularly regarding the non-functional street lights and faded road markings, which are essential for safe driving.

The disparities in infrastructure provision and maintenance have significant implications for urban development in Asaba. Roads like Nnebisi and Anwai, which are relatively well-maintained, support smoother traffic flow and safer road use, contributing positively to the city's urban environment. However, the neglect of major roads like Asaba-Benin and Ibusa undermines these benefits, leading to increased traffic congestion, higher accident rates, and a generally less efficient urban transport system. These issues are likely to be exacerbated by ongoing urbanization and population growth, further straining the city's road infrastructure.

The findings suggest an urgent need for a more balanced and comprehensive approach to urban infrastructure development in Asaba. This includes prioritizing the provision of essential road furniture such as bus stops, walkways, and parking spaces on all major roads, as well as enhancing the maintenance of existing infrastructure, particularly drainage systems and street lighting. Such measures would not only improve road safety and efficiency but also support the broader goals of sustainable urban development in the city. Overall, addressing the identified gaps in infrastructure provision and maintenance is crucial for ensuring that

Asaba's road network can meet the demands of its growing population and support the city's continued development as a major urban center.

Conclusion

This study has critically examined the provision and maintenance of road infrastructure in Asaba, highlighting significant disparities across key roadways. The findings reveal that while some roads, such as Nnebisi Road and sections of Anwai Road, are relatively well- equipped and maintained, others, including Asaba-Benin Road and Ibusa Road, suffer from inadequate infrastructure and poor maintenance. These inconsistencies have profound implications for road safety, traffic management, and overall urban development in Asaba.

The study underscores the urgent need for comprehensive urban planning that addresses these disparities by ensuring the provision of essential road furniture—such as bus stops, walkways, and parking spaces—across all major roads. Additionally, it calls for enhanced maintenance efforts, particularly in the areas of drainage, street lighting, and road marking, to ensure the long-term sustainability of Asaba's road network.

In conclusion, addressing the identified gaps in road infrastructure is vital for improving transportation efficiency, enhancing road safety, and supporting the city's continued growth. A more balanced and strategic approach to urban infrastructure development will be crucial in ensuring that Asaba's road network can adequately meet the needs of its expanding population and contribute positively to the city's overall development trajectory.

Recommendations

1. **Comprehensive Road Infrastructure Upgrade:** The government and relevant authorities should prioritize the upgrade and expansion of key roads in Asaba, particularly those with significant deficiencies such as the Asaba-Benin Road and Ibusa Road. This upgrade should include the installation of missing road furniture, such as bus stops, pedestrian walkways, and designated parking spaces, to enhance the overall functionality and safety of the road network.
2. **Enhanced** Maintenance **Programs:** Establish a robust and systematic road maintenance program that regularly addresses issues such as drainage system clearance, road surface repairs, and the maintenance of street lights and road markings. Special attention should be given to roads with poor conditions, such as the Asaba-Benin Road, to prevent further deterioration and ensure safe and efficient transport.
3. **Implementation of Smart Traffic Management Systems:** To alleviate congestion and improve traffic flow, it is recommended to implement smart traffic management systems, including traffic signals, real- time traffic monitoring, and better signage. This will not only improve road safety but also reduce the economic losses associated with traffic congestion and vehicle maintenance costs.

4. **Community Engagement and Awareness:** Increase community involvement in road infrastructure planning and maintenance through public consultations and awareness campaigns. Educating residents on the importance of road infrastructure and encouraging their participation in reporting issues or providing feedback can lead to more effective and sustainable road management practices. This community-centric approach can also help in maintaining the cleanliness and functionality of roads and associated facilities.

References

Adane, M. (2021). *Assessment Of Strategic Management Practices; The Case Of Ethiopian Roads Authority* (Doctoral Dissertation, St. Mary's University).

Adetunji, M. A. (2014). Maintenances of urban roads infrastructure in a medium sized city in north central Nigeria. *Romanian Review ofsocial Sciences,* (7).

Afrin, T., & Yodo, N. (2020). A survey of road traffic congestion measures towards a sustainable and resilient transportation system. *Sustainability, 12{11),* 4660.

Akpoyibo, 0., Anomohanran, 0., & Ossai, C. (2022). Application of 2-D imaging survey for ascertaining the cause (s) of road failures along Sapele/Agbor road in Delta State, Nigeria. *Scientia Africana,* 21(3), 215-232.

Emeasoba, U. R., Ogbuefi, J. U., & Enugu, C. (2013). Sustainable socio-economic development in Nigeria: a case for road infrastructure maintenance. *Journal of Environment and Earth Science,* 3(5), 129-137.

Emeasoba, U. R., Ogbuefi, J. U., & Enugu, C. (2013). Sustainable socio-economic development in Nigeria: a case for road infrastructure maintenance. *Journal of Environment and Earth Science,* 3(5), 129-137.

Ipingbemi, 0. (2008). Exploring labour-based approach for rural road maintenance in Nigeria. *Journal of social Sciences,* 17(2), 103-111.

Jackson, E. A. (2020). Importance of the Public Service in achieving the UN SDGs. In *Decent Work and Economic Growth* (pp. 551-561). Cham: Springer International Publishing.

Jiboye, A. D., Adebayo, J. A., & Obakin, O. A. (2020). Urban housing in Nigeria for sustainable development: Challenges and prospects. *International Journal of Advanced Engineering Research and Science,* 7(7), 478-491.

Kararach, G. (2014). Infrastructure and Connectivity. In *Development Policy in Africa: Mastering the Future?* (pp. 98-121). London: Palgrave Macmillan UK.

Newman, J. (2013). The governance of public-private partnerships: Success and failure in the transportation sector.

Onokala, P. C. (2015). Transportation development in Nigeria: The journey so far and the way forward. *The 97th Inaugural Lecture. University ofNigeria, Nsukka.*

Samuel, C. P. (2023). The Impact Of Mass Transit System As It Affects Urbanization From Asaba To Awka. *Nan Department Of Civil Engineering Final Year Project & Postgraduate Portal,* 2{l).

Singh, S. K. (2012). Urban transport in India: issues, challenges, and the way forward.
European Transport Trasporti Europei (2012) Issue, 52.

ASSESSMENT OF FACTORS COMMUTERS' PRIORITIZE WHEN EVALUATING THE QUALITY OF INTERCITY TRANSPORT SERVICES IN IBADAN METROPOLIS

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Abstract: *Transportation is a non-separable part of any society. The role of transportation is to move people, goods, and services from one geographical location to another and transportation improvement has led to changes in standard of living and urban development. This has greatly influences the development of civilizations because the role of transportation in movement of people, goods, and services from one geographical location to another between countries and within a country. The study assessed the factors commuters prioritized when evaluating the quality of intercity transport services in the Ibadan metropolis, Nigeria. This study focused on the demographic characteristics of commuters in the Ibadan metropolis and measured the quality of services such as; reliability, punctuality, safety, security, comfort, amenities, affordability, cost-effectiveness, accessibility, and convenience, which gave insight into the study. A purposive sampling technique was used to select 400 commuters boarding inter-city vehicles across 5 different parks in the study area. A well-structured questionnaire form was designed and used to gather data in the study area. Notable challenges identified included safety concerns, delays, affordability issues, and amenity inadequacies. Policy implications and recommendations was raised to addressed the identified challenges, advocating for collaborative stakeholder engagement, regular commuter surveys, pilot interventions, and technology integration. The policy implications and recommendations underscored the importance of an adaptive and customer-centric approach to addressing the complexities of intercity transport challenges in Ibadan. The research contributed to the discourse on transportation challenges, providing a foundation for evidence-based interventions and continuous improvement in intercity transport services.*

Keywords: Commuters, quality, evaluation, intercity, transport, services, Ibadan, metropolis.

1.0 INTRODUCTION

Mobility is one of the most basic and crucial qualities of economic activity since it meets the basic demand of getting from one place to another, which is shared by passengers, freight, and information. As a result, the transportation industry is becoming an increasingly essential part of the economy, with implications for population development and welfare (Hundal, 2015). When transportation systems are efficient, they give economic and social opportunities and advantages, resulting in positive multipliers such as increased market access, employment, and investment (Agrawal, 2018). Advances in transportation have made possible changes in the way of living and how societies are organized and therefore have a great influence on the development of civilizations (Mathew 2009). While different means of public transportation are known and used globally such as the light rail, city buses, trolleybuses, and rapid

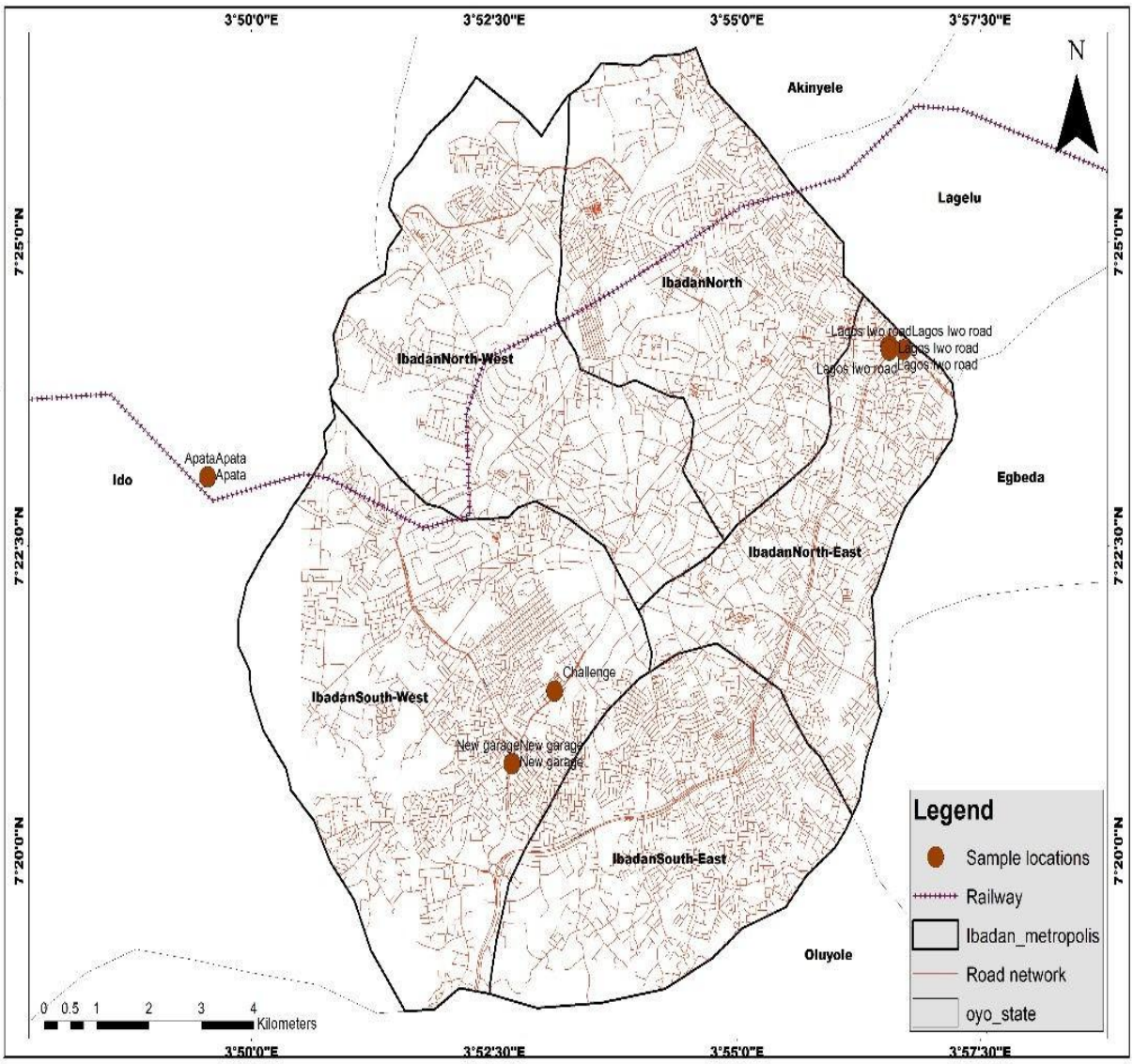
transit among others, public road transport is widely patronized in most developing nations (Gana & Emmanuel, 2014; Nellore & Hancke, 2016).

Today in Nigeria, one of the essential means of facilitating movements within the cities is through public transport. Public transport systems provide the most efficient means of moving large numbers of people, especially in densely populated urban centres. White (2002) opines that public transport is all modes of transportation available to the public, irrespective of ownership. Mass transport systems are varied, they are either land-based (rail), road-based mass transit systems, or water-based. Public transport operation in Nigeria is the responsibility of a joint group of private and public sector operators, although the private sector owns more than 90% of the urban public transport services (Amamilo and Agbor, 2018). In Ibadan, over 90% of the transport demands are met by individual public transport operators (Christopher and Adewumi, 2017). Public transportation promotes road transportation efficiency and provides means of transporting people in large numbers (Yingjiu *et al.,* 2019). The majority of drivers of small vehicle units, such as buses, taxis, space wagons, and semi-smaller coastal buses, which also offer inter-urban passenger transport services, have independent businesses but belong to one or more associations. This group includes relatively few large-scale bus fleet operators who typically provide long-distance service (Aworemi and Ilori, 2008). A commuter is a traveler who recurring travels between one's place of residence and place of work or study, where the traveler leaves the boundary of their home community (Eboli & Mazzulla, 2012) while traveling between cities or other destinations that are spread out across a substantial distance is referred to as intercity travel (Dike *et al.* 2018). In a country with increasingly limited resources, the inter-city urban transport dilemma in Nigeria has been identified as the cause of the country's fast-expanding need for mass transportation. Intercity transport services in Nigeria according to Atoyebi *et al* (2015) have been dominated by private operators who dictate largely the operational characteristics in terms of facility provision, services, and standards in the industry. According to Lee (2014), customer happiness is the end outcome of a high level of service, which seems to prove a connection between the two. According to Zeithaml *et al*. (2009) and Lee (2014), passengers' perceptions of the quality of the service play a role in how satisfied they are. Although satisfaction and service quality both have a similar trait, satisfaction is frequently viewed as a more general

concept than service quality assessment. However, due to the high standards that must be maintained to satisfy every customer, there have been several problems and difficulties with passenger satisfaction in all service areas. Both Zahari (2008) and Gomatheeswaran & Sivakumar (2014) emphasize how important good service is, both in the public and private sectors. The needs of the customers must be transformed into a quantifiable service pattern. Overcrowding, is a significant issue that affects passengers, is one of the causes examined by Vimal and Jitin (2015). However, the goal of this study is to assess the factors commuters prioritize when evaluating the quality of intercity transport services in the Ibadan metropolis. To achieve this, two objectives are set (1) Determine common travel patterns and frequencies of commuting using intercity transport services in the Ibadan metropolis. (2) Examine the key factors commuters prioritize when evaluating the quality of intercity transport services in the Ibadan metropolis.

2. Methods and Methodology.

The study site is located in Ibadan, the capital of Oyo State in the South-western part of Nigeria, which comprises of urban and peri-urban settlements. The city of Ibadan is a major Nigerian transport hub with freeways linking it with Lagos in the South West, Ijebu Ode and Shagamu in the South, Abeokuta in the West, Oyo, Ogbomosho, Offa and Ilorin in the North, Ife, Ado Ekiti, Oshogbo, Ilesha, Akure, Okene, Auchi and other cities towards the East. The city is also served by an airport, the Ibadan Airport, which operates daily flights to Abuja, Lagos, Kano, Ilorin, etc. through major airlines in Nigeria such as Overland Airways and Arik Air (Adebola and Enosko, 2012), and is also a major terminus railway station on the main railway line linking Lagos with Kano in the North of the country.



The study employed a quantitative research design to investigate factors commuters' prioritize when evaluating the quality of intercity transport service. The target population consisted of commuters who board inter-city vehicles across 5 different parks in the study area, with an estimated daily average patronage of 4,293 commuters and 1,566,945 commuters yearly (Authors fieldwork 2023). Based on the Yamane (1967) sample size determination formula, the study's sample size was 400 respondents. Purposive sampling was used in this study to select five major parks in the Ibadan metropolis where commuters board intercity vehicles/buses to other cities. The names of selected parks, selected units in each park, and sample size are presented in Table 3.1. A purposive sampling technique was also adopted in selecting respondents in the sampled parks since the parks are full of intra-city and inter-city commuters. This technique allowed the commuters boarding intercity vehicles the chance of

being selected for the questionnaire administer, the respondents were given a questionnaire as they got to the park to board the intercity-bus till the required number was achieved.

Table 3.1: Sampled parks and units

S/N	Parks	Units in the parks	No. of commuters	No. of Questionnaire
1	Iwo Road	Akure/Ado/Ondo/Ife/Oshogbo	216,810	56
2		World Oil Park/ Lagos	402,595	103
3	Ojoo Bus Terminal	Oyo	175,200	45
4		Ilorin	142,350	36
5		Saki	83,950	22
6		Jos	11,680	3
7		Ogbomosho	71,540	18
8		Lagos	91,250	23
9		Kaduna/kano	20,805	5
10	Challenge	Lagos/Ajah	149,650	38
11	New Garage	Ijebu ode/Epe/Ijebu igbo	106,215	27
12	Apata	Abeokuta	94,900	24
TOTAL			**1,566,945**	**400**

The questionnaire was designed according to research objectives proposed. The questionnaire was divided into two parts. The first part was an individual characteristic data and the second data emphasized factors commuters prioritize (reliability, punctuality, safety, security, comfort, amenities, affordability, cost-effectiveness, accessibility, and convenience) when evaluating the quality of intercity transport services. Assessment of the factors of service quality used a five point Likert scale, ranging from; strongly disagree = 1, disagree = 2, neutral/certainly = 3, agree = 4 and strongly agree = 5. Research conducted by Perez *et al.* (2007), Fellesson & Friman (2008), and Randheer *et al.* (2011) have successfully used a five-point Likert scale in measuring the service quality.

3. Result Discussion

Table 3.1: Socio- economic characteristics

Variables		Ojoo Bus Terminal	Iwo-road	Challenge	Apata	New Garage	Total	Percents
Gender	Female	72	76	20	11	11	190	48.5%
	Male	76	83	18	10	13	200	51.5%
Age	Under 18	2	30	1	3	2	38	9.5%
	18-24yrs	12	50	6	8	8	84	21.1%
	25-34 yrs	50	29	21	8	9	117	29.3%
	35-44 yrs	51	30	9	3	6	99	24.8%
	45-54yrs	23	12	0	0	1	36	9.0%
	55 and above	13	8	1	1	0	23	5.8%
Marital status	Single	25	84	15	10	9	143	35.8%
	Married	116	68	21	10	14	229	57.4%
	Widowed	6	6	1	1	3	17	4.3%
	Divorced	5	1	1	1	1	9	2.3%
Educational Background	No formal education	11	5	1	1	8	26	6.6%
	Primary education	23	8	0	2	3	36	9.1%
	Secondary	36	47	10	5	7	105	26.6%
	Tertiary	61	89	27	14	7	198	50.1%
	Others	21	6	0	0	1	28	7.1%
Nature of employment	Govt. employees	28	18	6	3	8	63	15.8%
	Private sectors	27	31	12	5	8	83	20.8%
	Students	11	49	4	5	3	72	18.0%
	Self-employed	64	42	10	6	2	124	31.1%
	Trader	21	12	4	2	4	43	10.8%
	Unemployed	1	3	2	2	2	10	2.5%
Monthly Income	Below 20,000	12	53	5	3	6	79	20.2%
	20,001-50,000	45	34	13	8	12	112	28.6%
	50,001-100,000	43	35	7	4	2	91	23.3%
	100,001-200,000	31	16	6	6	5	64	16.4%
	Above 200,000	21	13	7	2	2	45	11.5%

The majority (52%) of the participants were females, while (48%) were males, and 75.1% were in the age group of 18–44 years, while 9.5% were under 18 years, and 15.4% were in the age group of 45 years and above. Married respondents' comprised 57.3%, and 42.7% were unmarried. The majority of the participants

41.8% were self-employed, 20.8% private sector employees, 18% students, 15% were Government employees and 3.8% unemployed. 51.3% of the participants have tertiary educational qualifications, while 26.3%, 9.0%, 6.5% and 7.0% of the participants have senior high school, primary, no formal education, and above bachelor level qualifications respectively. The study also revealed that 28.6% of the respondents earn between 20,000- 50,000 monthly, 23.3% earn 50,001-100,000, 20.2% earn below 20,000, 16.4% earn between 100,001-200,000 while 11.5% earn above 200,000 monthly.

3.2 Common Travel Patterns and Frequencies of Commuting using Intercity Transport Services

The study revealed that, 52.0 percent of the respondents prefer public bus, 40.3 percent of the respondents prefers private car, 7.5 percent of the respondents prefer train and 0.3 percent of the respondents prefers others. 27.8 percent of the respondents undergoes inter-city travels for their various work/jobs, 25.5 percent for social and recreation activities, 20.5 percent for shopping, 19.0 percent for education purposes, while 4.3 percent for medical/ health care services, and 0.8 for other purposes which is for visitation. It further revealed that majority of the respondents 69.8 percent of the respondents spends 2 to 4 hours on the road, 13.3 percent of the respondents spend 5 to 7 hours, 9.0 percent of the respondents spend just an hour, while 4.8 percent of the respondents spent 8 to 10 hours and 3.3 percent of the respondents spend more than 10 hours. 35.6% of the respondent travels occasionally, while 32% travel monthly, 25.8 % travel weekly for their various purposes and 6.5% daily.

Table 3.2: Common Travel Patterns and Frequencies of Commuting

Variables		Ojoo Bus Terminal	Iwo-road	Challenge	Apata	New Garage	Total	Percents
Preferred mode of Transportation	Private car	80	49	16	7	9	161	40.5%
	Public bus	65	94	21	15	11	206	51.8%
	Train	6	15	1	1	7	30	7.5%
	Others	0	1	0	0	0	1	0.3%
Primary purposes of travelling	Work/job	45	37	19	4	6	111	28.4%
	Education/school	16	45	4	8	3	76	19.4%
	Shopping	41	18	6	7	10	82	21.0%
	Social/recreaction	39	47	7	3	6	102	26.1%
	Medical/health	4	7	2	1	2	16	4.1%
	Others	3	0	0	0	0	3	0.8%
Average Commuting Time	1 hour	5	20	0	4	7	36	9.0%
	2-4 hours	92	124	38	14	11	279	69.9%
	5-7 hours	38	4	0	4	7	53	13,3%
	8-10 hours	9	8	0	1	1	19	4.8%
	More than 10 hours	8	3	0	0	1	12	3.0%
Frequency of travels to other cities	Daily	9	14	0	3	0	26	6.5%
	Weekly	42	38	10	4	9	103	25.8%
	Monthly	37	63	13	6	9	128	32.1%
	Occasionally	63	44	15	10	9	141	35.3%
Numbers of times commuters commute per week	1	28	53	5	3	6	79	20.2%
	2	52	34	13	8	12	112	28.6%
	3	33	35	7	4	2	91	23.3%
	4	22	16	6	6	5	64	16.4%
	More than 4	16	13	7	2	2	45	11.5%

3.3 Factors Commuters Prioritize When Evaluating the Quality of Intercity Transport Services.

1. Reliability and Punctuality

The information in Figure 3.1 shows that commuters prioritize reliability and punctuality when evaluating the quality of intercity transport services. This was ascertained as the respondents were asked if they consider reliability and punctuality when evaluating the services provided to them by intercity transport services. 41.3% and 24.5% of the respondents agreed and strongly agreed respectively that they consider reliability and punctuality when evaluating the quality of services, 15.5% were neutral, 4.5% disagreed and 13.3% strongly disagreed. This result shows that reliability and punctuality are one of the major factors commuters prioritize when

evaluating intercity transport services except for New Garage park where the opinions were different.

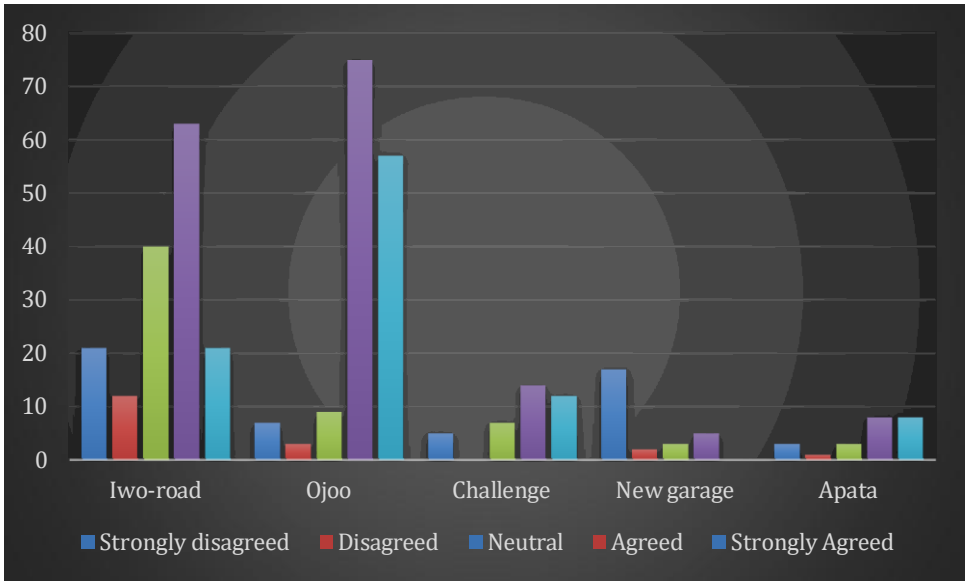


Figure 3.1: Reliability and Punctuality

Source: Author's Fieldwork, (2023).

2. Safety and Security

Figure 3.2 reveals that 38.5 percent of the total respondents agreed that they prioritize safety and security when evaluating the quality of intercity transport services provided, 20.8 percent of the respondents also strongly agreed to it, 20.8 percent of the respondents are not sure so they stayed neutral, while 13.8 percent of the respondents disagreed with it as well as 5.8 percent of the respondents who also strongly disagreed. This shows that safety and security is very important that why majority of the respondents (237) agreed that they prioritize safety when choosing and evaluating the quality of services rendered by the intercity transport.

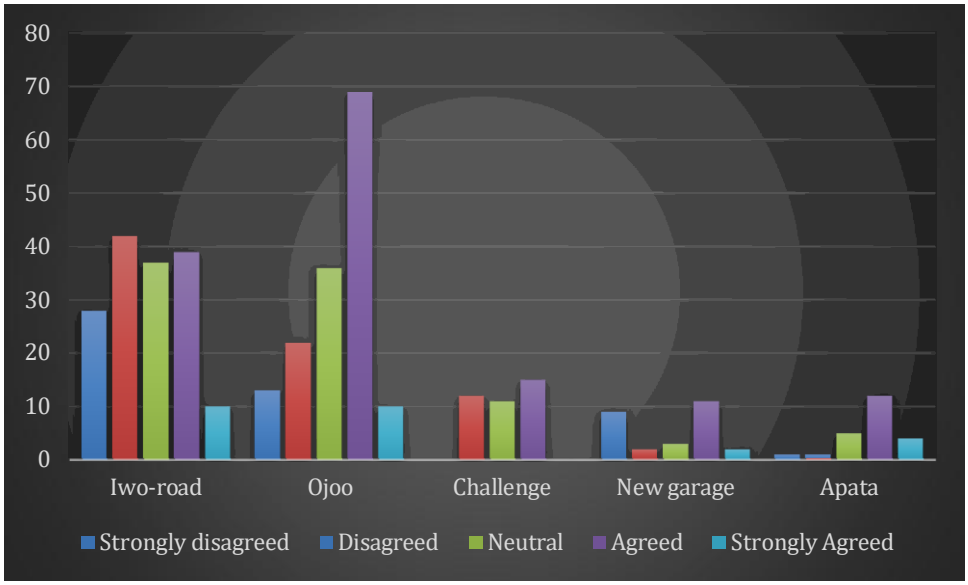


Figure 3.2: Safety and Security

Source: Author's Fieldwork, (2023).

3 Comfort and Amenities

Figure 3.3 reveals that 45.0 percent of the respondents agreed that they prioritize comfort and amenities when evaluating the quality of intercity transport services they use, 16.0 percent of the respondents also strongly agreed with that, but 13.0 percent of the respondents disagreed with that fact, 6.5 percent of the respondents also strongly disagreed while 19.0 percent of the respondents were neutral. This shows that majority of the respondents prioritize comfort and amenities provided by the intercity services provider when evaluating the services rendered or provided for them.

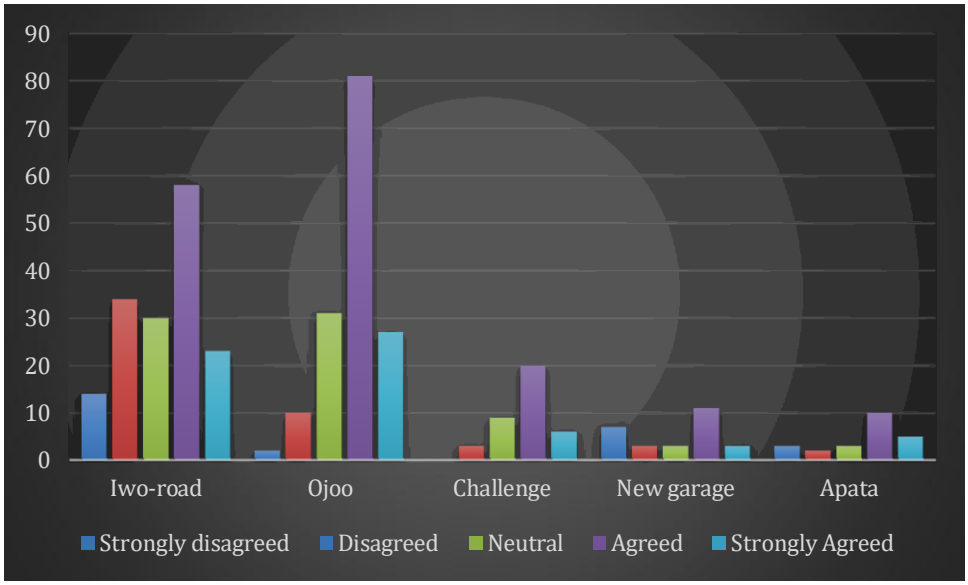


Figure 3.3: Comfort and Amenities

Source: Author's Fieldwork, 2023.

4. Affordability and Cost Effectiveness

The result indicates that 172 representing 43.0 percent of all respondents agreed that they prioritize affordability and cost effectiveness when evaluating the quality of services rendered by intercity transport services, 22.3 percent also strongly agreed with it, while 18.8 percent of the respondents stayed neutral but 11.3 percent disagree and also 4.0 also strongly disagreed that they prioritize affordability and cost effectiveness when evaluating intercity transport services. This shows that being able to afford the transport cost and prices charges by intercity transport services is being prioritized by commuters when evaluating the quality of services rendered by intercity transport services.

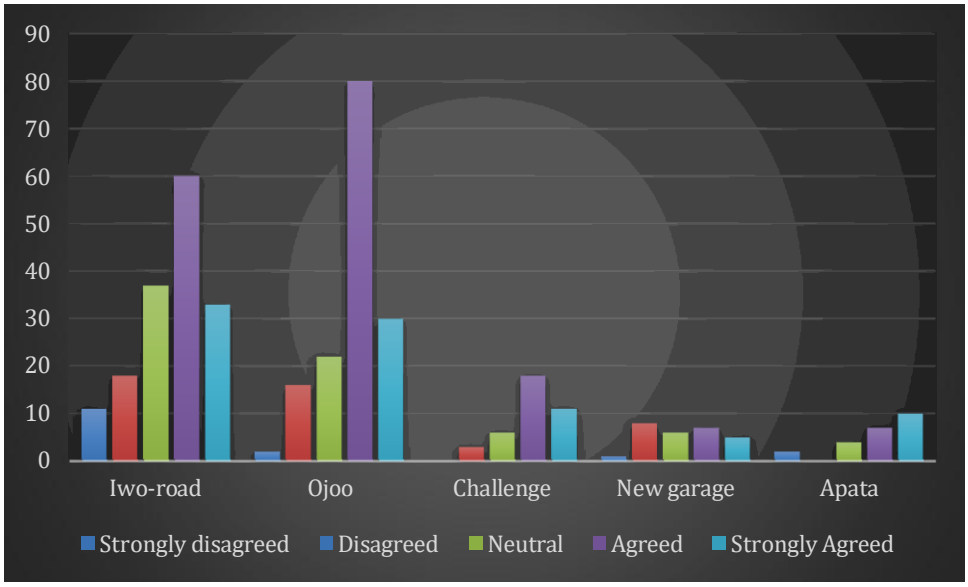


Figure 3.4: Affordability and Cost Effectiveness

Source: Author's Fieldwork, (2023).

5. Accessibility and Convenience

The proportion of respondents who stayed neutral that they are not sure if they prioritize accessibility and convenience constituted 20.3 percent of all respondents. The highest proportion of all respondents accounted for those who agreed and also strongly agreed that they prioritize accessibility and convenience when evaluating the quality of services provided by intercity transport services with 44.5 and 20.0 percent respectively, while 9.3 and 4.3 percent disagreed and also strongly disagreed respectively.

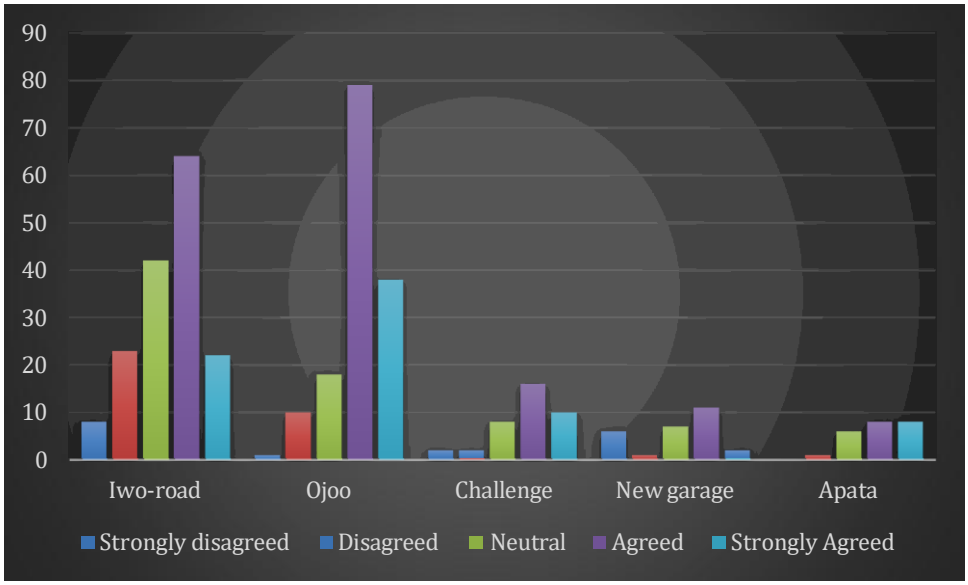


Figure 3.5: Accessibility and Convenience

Source: Author's Fieldwork, (2023).

Table 4.8 presents the key factors commuters prioritized when evaluating the quality of intercity transport services is provided using. The information in Table 4.8 gives vital information on the perception of commuters on the factors they prioritize when evaluating the quality of services rendered to them by intercity transport services. The factors they considered was ascertained by asking if the commuters prioritize reliability and punctuality, safety and security measures, comfort and amenities, affordability and cost effectiveness as well as accessibility and convenience among others. The result interestingly reveals that majority of the respondents agreed that they prioritized all the factors listed above, with 63.7 percent agreeing to prioritizing those factors, 17.2 percent disagreed that they do not prioritize those factors while 19.0 percent of the respondent stayed neutral. The implication of this is that majority of the commuters prioritize reliability and punctuality of the vehicle if they can get. This is in line with the findings of Vilakazi and Govender (2014), in South Africa, that all five dimensions were considered very important and also Wojuade and Badiora (2017) in Ibadan, their result shows that all variables have positive influence on user satisfaction.

Table 3.3: Factors Commuters prioritize

Factors Commuters prioritize				
		Responses		Percent of Cases
		N	Percent	
Commuters Factors	Strongly Disagreed	135	6.8%	33.9%
Reliability and Punctuality	Disagreed	207	10.4%	52.0%
Safety and Security	Neutral	377	19.0%	94.7%
Comfort and Amenities	Agreed	849	42.8%	213.3%
Affordability and Cost Effectiveness	Strongly Agreed	414	20.9%	104.0%
Accessibility and Convenience				
Total		1982	100.0%	498.0%

4. Recommendation

The following recommendations are geared toward improving factors commuters' prioritize when evaluating the quality of intercity transport services in Ibadan metropolis, Oyo State: (1) Stakeholder Collaboration: foster collaboration among key stakeholders, including transportation authorities, service providers, commuters, and relevant government agencies. (2) Regular Commuter Surveys: Implement regular surveys to gather ongoing feedback from commuters. Periodic surveys can capture evolving trends, changing preferences, and emerging issues, providing a dynamic understanding of the challenges faced and how to solve them and (3) Technology Integration: Explore the integration of technology to enhance service quality. Consider the implementation of mobile apps for real-time updates, electronic payment systems, and communication channels that allow commuters to provide instant feedback.

5. Conclusion

This research endeavor sought to comprehensively assess the factors commuters' prioritize when evaluating the quality of intercity transport services in Ibadan. The research work was guided by specific objectives, and identified challenges. The challenges identified, encompassing delays and unreliable schedules, overcrowding and lack of seating, safety concerns, poor customer service, communication, inadequate amenities and comfort, high cost and affordability issues, offer a comprehensive view of the obstacles faced by commuters

in Ibadan. The synthesis of findings, guided by these components, provides valuable insights into the complex dynamics of the transportation landscape in Ibadan. In light of the research findings, there is a compelling call to action for policymakers, transportation authorities, and service providers to collaboratively address the identified challenges.

References

Agrawal, R. (2018). Public transportation and customer satisfaction, Global Business Review, 9(2), 257-272.

Amamilo, C.A., Agbor, E., 2018. Competition and choice among intercity bus operators in Nigeria. Int. J. N. Technol. Res. 4 (10), 35–42.

Atoyebi A.O., Gbadamosi K, Nwokoro I.C., Omole K.F (2015). Analysis of Intra- City Public Transport System of Ojuelegba Park, Lagos State, Nigeria. •

Mediterranean Journal of Social Sciences.

Aworemi, J. R & Ilori, M. O (2008). An evaluation of the performance of private transport companies in selected South-western Nigeria. African Journal of Business Management Vol.2 (8), pp. 131-137, August 2008Available online at http://www.academicjournals .org/AJBMISSN 1993-8233 © 2008 Academic Journals.

Christopher, A.W., Adewumi, I.B., 2017. Users' satisfaction with public transport operations in Ibadan, Nigeria. J. Soc. Sci. Res. 3 (9), 88–96.

Dike, D. N., Ibe, C. C., Ejem, E. A., Erumaka, O., & Chukwu, O. E. (2018). Estimation of inter-city travel demand for public road transport in Nigeria. Journal of Sustainable Development of Transport and Logistics, 3(3), 88-98.

doi:10.14254/jsdtl.2018.3-3.7.

Eboli L. & Mazzulla G (2012). Structural Equation Modelling for Analysing Passengers' Perceptions about Railway Services. Available online at www.sciencedirect.com

Gana, A.J. & Emmanuel, J.A. (2014). Road Transportation and traffic law enforcement in Nigeria: A case study of the Federal Road Safety Corps (FRSC). West African Journal of Industrial and

Academic Research, 2(1):134 – 151

Hundal, B.S., (2015). Assessing the Service Quality of Northern Railway by using SERVQUAL Model

Kokku Randheer, Ahmed A. AL-Motawa, and Prince Vijay. J. (2017). Measuring Commuters' Perception on Service Quality Using SERVQUAL in Public Transportation, International Journal of Marketing Studies, 3(1), 2011, 21-34.

Lee, H.J. (2014). A study on purchase satisfaction and repurchase intention according to usage motivation when purchasing fashion products in social commerce. Fashion and Textile Research Journal, 16(4).

M. S. Pérez, J. C. G. Abad, G. M. M. Carrillo, and R. S. Fernández, Effects of service quality dimensions on behavioural purchase intentions: A study in public-sector transport, Managing Service Quality, 17(2), 2007, 134-151.

M.Gomatheeswaran, B.Sivakumar, "A study on passengers satisfaction towards railways services with special reference to (coimbatore junction)", International Journal of Multidisciplinary Research and Development, Volume 1, Issue 6, 2014, pp.17-20

Markus Fellesson and Margareta Friman, Perceived satisfaction with public transport services in nine European cities, The Journal of Transportation Research Forum, 47(3), 2008, 93-103.

Matthew, H. (2009). Transit Response to Congestion Pricing Opportunities. Journal of Public Transportation, Vol. 12, (3), pp. 61-77.

Nellore K & Hancke G.P (2016). A Survey on Urban Traffic Management Systems Using Wireless Sensor Networks. Advanced Sensor Networks Research Group, Department of Electrical, Electronic and Computer Engineering, University of Pretoria, Pretoria 0002, South Africa

Vilakazi A.M. Govender K.K. (2014). Exploring public bus service quality in South Africa: A

structural equation modelling approach. Journal of Transport and Supply Chain Management 8(1)

Vimal K.P and Jitin P. (2015). A Study on Passengers' Satisfaction towards Railway Service With Reference To Coimbatore Junction. International Journal of Management and Commerce Innovations ISSN 2348-7585 (Online) Vol. 2, Issue 2, pp: (578-582), www.researchpublish.com Page | 578Research Publish Journals

White, T (2002). Public transport: Its planning, management and operations, New York, New York Press.

Wojuade C.A and Badiora A.I (2017). Users' Satisfaction with Public Transport Operations in Ibadan, Nigeria The Journal of Social Sciences Research ISSN(e): 2411-9458, ISSN(p): 2413-6670 Vol. 3, No. 9, pp: 88-96, 2017 URL: http://arpgweb.com/?ic=journal&journal=7&info=aims

Yingjiu, P., Shuyan, C., Tiezhu, L., Shifeng, N., Kun, T., 2019. Exploring spatial variation of the bus stop influence zone with multi-source data: a case study in Zhenjiang, China. J. Transp. Geogr. 76, 166–177.

Zahari, W. Y. (2008). FM-SERVQUAL: a new approach of service quality measurement framework in local authorities. Journal of Corporate Real Estate, 10(2), 130- 144.

Zeithaml, V.A., 1988. Consumer perceptions of price, quality and value: a means and model and synthesis of evidence. Journal of Marketing 52.3, 2-22

EVALUATION OF THE EFFECT OF EACH FACTOR LIMITING IMPLEMENTATION OF PUBLIC SURFACE TRANSPORT POLICY.

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ABSTRACT
This research evaluated the effect of each factor Limiting Implementation of Public Surface Transport Policy in Nigeria. The collapse of inter-modal transportation and the increased pressure on roads highlights limitations in policy implementation. Using cross-sectional research design, data were collected from stakeholders (ministries) in charge of road and rail construction and maintenance. Structured questionnaires comprising 20 items to identify factors limiting implementation of Public surface Transport policy in Nigeria were quantitatively adopted..Using Statistical analyses; regression modeling, the impact of these limiting factors on the implementation of public surface transport policy were substantially established. Findings revealed significant challenges hindering policy implementation, including political influence (Coefficient: 0.301, $p < 0.05$), financial constraints (Coefficient: 0.216, $p < 0.05$), knowledge gaps and human capacity-building (Coefficient: 0.137, $p < 0.05$), technological barriers and R&D (Coefficient: 0.112, $p < 0.05$) and stakeholder expectations (Coefficient: 0.228, $p < 0.05$).Recommendations for policymakers and administrators include reforming existing policies, optimizing financial resource allocation, investing in human capital, fostering technological advancement, and promoting inclusive decision-making processes. These are actionable insights to inform policy reforms and enhance the effectiveness of transportation infrastructure development initiatives.

Keywords*: factors limiting, Implementation, Public, Surface, Transport Policy.*

Background Information

Transportation stands as a cornerstone of national infrastructure, exerting profound influences on the social/economic fabric of a nation. It serves not only as a facilitator of growth and development but also as a potential obstacle that can impede societal progress. Effective transport policies play a pivotal role in the allocation, management, and regulation of transportation resources, thus shaping the trajectory of a nation's development.(Williams,2016).

Governments enact regulations, infrastructure policies, pricing policies, and land-use policies to guide the transport sector for policy formulation and implementation (Williams, 2016).

Marume's (2016) definition characterizes Public Surface Transport Policies as comprehensive frameworks comprising principles, regulations, guidelines, rules and laws established by government to govern the planning, operation, management of Public Surface transportation systems so as to realize long-term goals for an efficient and accessible public surface transportation services. However, the challenge often lies in the proper implementation of these policies.

Babatunde (2020) highlights the central role of the government and its agencies in the process of policy formulation and implementation in Nigeria. Despite the potential involvement of civil society organizations in principle, their actual participation in policy processes remains limited in practice. Policy formulation, as an instrumental tool employed by both public and private organizations, addresses existing problems, and aims to prevent their recurrence through articulated goals and objectives. (Babatunde, 2020).

The history of transport policy in Nigeria reveals a series of policy documents and reforms aimed at addressing the malfunctioning of the nation's transport system. The emergence of the 1993 document, as the first National Transport Policy with its thrust on modal development led to the 2003, 2008, and 2010 reforms. These reforms sought to address issues of modal development, integrated intermodal development, deregulation, privatization, and public-private partnership. However, the gap between policy formulation and effective implementation persisted, resulting in the deterioration of facilities in the transport sector, especially in surface transportation. (Sumalia, 2013).

The latest reform in 2010 aimed at institutionalizing the transport system through the creation of central coordinating centers, but thirteen years post-reform, the lofty goals and objectives for the transport sector, particularly surface transportation, remain largely unattainable. This gap between policy formulation and implementation has resulted in a crisis in Nigeria's transport system, marked by a lack of integration among various transport modes, inefficiencies, accidents, and high maintenance costs (Oladipo, 2016).

Road transportation involves interrelationships between the physical environments, models of political and social activity, and economic development status. (Oroleye,2019).Unlike other modes, road transportation has improved most of the world's population mobility and accessibility tremendously(Oni,2011).
Road infrastructure is described as a set of roads arranged in the form of a network linking the inhabited parts. As the population of an area increases, the intensity of human activities becomes significant, and the road network is more congested. (Babatunde,2020).

The Nigerian Railway Corporation began in 1898, the first railroad in Nigeria was constructed by the British colonial government in October 3, 1912. (nrc.ng.org,2022). The rail network reached its maximum extent shortly after Nigerian independence, in 1964. Shortly after that, the NRC entered a long period of decline, inept management, and eventually a complete lack of maintenance of rail and locomotive assets.(https://all Africa.com/stories/2011).Lack of a specific policy statement on how the rail system/ railway should develop and the role to be performed within the economy constituted severe problem for the rail system in Nigeria. The allocation of funds to the transport system that favored the highways has left the rail mode in precarious conditions and there

is need to amend the status of the Corporation (Wikipedia,2023)

One of the major transportation problems in Nigeria is the inadequate integrated intermodal system like railroads. The absence of utilitarian railways interfacing the ports to significant urban areas has constrained merchant to transport their merchandise and product completely by road. The challenges faced by the transport sector are multifaceted, encompassing poor maintenance culture, underinvestment, and a decline in capital spending on transport development programs since the 1980s (Babatunde, 2020). The transformation of the transport sector is not only an economic imperative but also a crucial step toward alleviating poverty and promoting sustainable development in Nigeria. Identifying the policy issues that hinder the effective delivery of transport solutions is essential for devising strategies that ensure efficient and sustainable transport systems.

Problem Statement

The state of rail/road transport infrastructure in Nigeria, particularly the federal highways and railways, stands at a critical juncture. Despite the comprehensive policy reforms initiated through the National Transport Policy (NTP) in 1993, 2003, 2008, and 2010, the condition of rail tracks/federal highways remains deplorable, and the infrastructural deficit persists. As of 2010, the federal highway network, comprising 34,123 km of major roads and critical bridges, faced challenges such as overuse, lack of maintenance, and a staggering 50% in poor condition (Buhari, 2000; FGN, 2010). Additionally, State and Local Government roads, constituting most of the road network, were also in suboptimal conditions, highlighting a systemic issue in the overall transport infrastructure (Buhari, 2000).

The constitutional distribution of responsibilities for road planning, development, and maintenance among the three tiers of government—Federal, State, and Local—has not translated into effective management of the nation's road network.

The allocation of funds to the transport system that favored the highways has left the rail mode in precarious conditions. There is need to amend the status of the Corporation, giving the management the needed powers. Appointments to the executive level of the Rail Corporation should be based on merit jettisoning the practice of employing persons on political or ethnic ground. Despite the existence of agencies like the Federal Ministry of Transport, Federal Ministry of Works, and the Federal Road Maintenance Agency (FERMA), the impact on ground has been minimal, raising questions about the effectiveness of the institutional arrangements in place (Federal Republic of Nigeria's Constitution, 1999).

While successive Nigerian governments have introduced National Transport Policies to address the growing demand for transportation and promote sustainability, the policy reforms have fallen short of achieving significant improvements/implementations. The collapse of the railway system and the subsequent increased pressure on roads highlights the inadequacies of the existing transport policies. Notable studies by Buhari (2000), Sumaila (2013), Agbonkhese et al. (2013), and Igwe et al. (2013) have reviewed the national transport policy but failed to link the deteriorating state of Rail tracks/ federal highways to the limitations and weaknesses imposed by the national transport reform document.

This study aims to evaluate each factor limiting the effective implementation of public surface transport policy in Nigeria, Although several policies have been

beautifully crafted in the past as contained in the NTP, 2003, 2008, and 2010 documents, a lack of coordinated effort has hindered the effectiveness of implementing these policies.

Objective of Study

1. To Evaluate the effect of each factor limiting implementation of surface transport policy.

Research Question

1. How does each factor affect the implementation of surface transport policy?

Research Hypothesis

Ho1: Each limiting factor has no significant effect on implementation of surface transport policy.

Scope of Study

The scope of this study is defined by its focus on the surface transportation sub-sector, encompassing both road and rail infrastructure, within the geographic context of the six geo-political zones of Nigeria.

Conceptual Framework

In the post- colonial era, re-orientation of goals in transport sector became essential as transportation served as an instrument of unification of the country and an important tool for social and economic development. The identified major imbalance between the needs of Nigerians and economy for adequate transport facilities and the ability of the transport sector to meet such demands informed the introduction of National Transport Policy.(Oroleye,2019).

Oroleye, (2019) defined public policy as the proposed course of action of the government or one of its divisions. It is also defined as the authoritative allocation of values to the whole society. Policy formulation is an instrument that is used both by public and private organizations to address existing challenges or imbalances and safeguard the re-occurrence of such in the nearest future through articulated goals and objectives as contained therein. A draft of the National Transport Policy was prepared in 1965, it was not adopted. Observed extreme malfunctioning of the nation's transport system and the associated problems lead to the emergence of the 1993 document, as the first National Transport Policy with its thrust on modal development.

The realization of the fact that the aspiration contained in this document seemed inadequate to transform the dynamics and ever-changing transport sector environment nationally led to the 2003, 2008 and 2010 reforms which paid attention to integrated intermodal development, deregulation, privatization, and public-private partnership respectively. Policy reform is a condition that prevails on policymakers to effect changes on a policy after discovering some lapses. This in effect did not imply that during the period, efforts were not made to improve and maintain the system and make it functional, but the overall demand for transport services and use of roads in Nigeria seems to exceed the supply. This situation requires urgent remedies to effect needed changes and improvement in the transport sector and particular road transportation in Nigeria.(Sumalia,2013).

The 2008 reform was short-lived as the need for its re-engineering of policy goals and objectives in line with social, economic and technological reality informed the emergence of 2010 National Policy document which suffers the same faith and remains essentially as a draft with the previous policies, but its contents are being implemented.(Oni,2011).

The 2010 National Transport reform is aimed at institutionalizing the transport system through the creation of central coordinating

centers to administer its affairs. Despite the various policy document reforms, the transport sector and road transport mode witnessed deterioration in facilities nine years after the last reform, not much could be said to have been achieved in the transport sector in general and road sub-sector in particular. The lofty general policy goals and objectives for the transport sector and in particular the road transportation seem unattainable. As many of the Federal highways and bridges in Nigeria and expressways, are characterized with large potholes and failed portions which slow down movements and expose users to frequent accidents with the attendant loss of lives and properties. (Sumalia,2013).

According to the Federal Republic of Nigeria's Constitution (1999) the responsibility of the planning, developing and maintaining the nation's transport infrastructure is shared among the three tiers of Government. To this end, intra-state roads are the responsibility of State Governments; Local Governments are required to cater for intra-urban and rural feeder roads, while the Federal Government, through Federal Ministry of Transport, Federal Ministry of Work and Federal Road Maintenance Agency (FERMA), is responsible for the maintenance of national highways which constitute only 17% of the existing road network in Nigeria. Despite the lopsided institutional arrangement, the impact of the three tiers of government and the Federal Government, remained minimal as the condition of Nigerian roads has become deplorable and inadequate, notwithstanding the reform put in place. (UN.Habitat, 2015).

REVIEW OF IDENTIFIED FACTORS LIMITING IMPLEMENTATION OF PUBLIC SURFACE TRANSPORT POLICY IN NIGERIA

S/N	IDENTIFIED FACTORS	REVIEW OF EACH IDENTIFIED FACTOR
1.	POLITICAL FACTORS	Short-term political gains conflicting with long-term goals Excessive political influence on decision-making Hindrance due to transitioning political Governments Balancing political interests sustainably. (Ben,2018)
2.	STAKEHOLDERS DYNAMICS	Collaboration in policy implementation among stakeholders Hindrance due to non-involvement of key actors Influence of stakeholder expectations on implementation Uniform interpretation of policy by stakeholders (Oroleye, 2019)
3.	FINANCIAL CONSTRAINTS	Financial limits on infrastructure investments Hindrance due to financial challenges Satisfaction with allocated funds Exploration of alternative funding sources. (Rode, P., Heeckt, C., da Cruz, N.F. 2019).
4.	INSTITUTIONAL AND HUMAN CAPACITY	Knowledge gaps in transport ministries Need for capacity-building initiatives Effectiveness of institutional structures Unsatisfactory coordination among institutions. (Dahida&Maidoki, 2013)

5.	TECHNOLOGICAL CHALLENGES	Technological barriers hindering implementation. Over Reliance on imported technology Impact of insufficient research and development (R&D) Potential of technological innovations. (Rode, P., Heeckt, C., da Cruz, N.F. 2019).
6.	AGITATIONS/INSECURITY	The unrest, killings, protest and different demands of the various proscribed and non-proscribed groups at the six geo-political states in Nigeria are indeed one of the most current factors hindering and affecting the implementation of some good will policies, laws, regulations in the Nation. (Source: Author).
7.	EXTERNAL PRESSURE	The external pressures and actors, consisting of international and regional organizations, non – governmental organizations and significant others contribute to policy formulation through their own influences; the provision of information and data; the supply of technical assistance; and the spread of philosophies and success stories in other countries and areas. Amongst the main influential, external sources of government policies are the donors, through their expertise, aid, and technology. (Marume,2016)

SOURCE: AUTHOR (2024)

Theoretical Framework:

Institutional Theory: This theory suggests that the structure, norms, and regulations within institutions influence their behavior and decision-making processes. In the context of surface transport policy implementation, factors such as bureaucratic inefficiencies, lack of coordination among agencies, and institutional resistance to change could hinder effective implementation.

Stakeholder Theory: According to this theory, the interests and influence of various stakeholders, such as government agencies, private sector entities, communities, and advocacy groups, impact policy outcomes. Conflicting stakeholder interests, power struggles, and insufficient stakeholder engagement may contribute to challenges in implementing surface transport policies.

Research Design and Strategy

Cross-Sectional Research Design

This design involves collecting data from a sample of participants at a single point in time and gathering data across a specified time frame. In the context of this study, it means that data is collected from respondents representing different experience levels at a specific time frame. This approach allows for the examination of relationships between public policies implementation and surface transport at a snapshot in time.

Study Area

The study area involves ministries responsible for Road and Rail construction and maintenance. The ministries include Federal Ministry of Works and Housing (FMWH), Federal Roads Maintenance Agency (FERMA), Nigerian Railway Corporation (NRC).

Data Collection Tools and Methods

Data Collection Method and Data Analysis Tool for Objective:

To evaluate the effect of each factor on the implementation of surface transport policy.

Data Collection Method

Responses from the structured questionnaires were used to assess the perceived impact of each factor limiting the implementation of surface transport policy.

Data Analysis Tools - Multiple Regression Analysis

Data obtained from the survey questionnaires were analyzed using multiple regression analysis.

The multiple regression analysis model used in this study is represented by the following equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_p X_p$$

Where:

- Y is the dependent variable.
- β0 is the intercept.
- β1,β2,…,βp are the coefficients of the independent variables.
- X1,X2,…,Xp are the independent variables.
- ϵ is the error term.

Statistical software was used to estimate regression coefficients, assess the significance of relationships, and evaluate the overall fit of the regression model.

Table>Multiple Regression Analysis

Variable	Coefficient (β)	Standard Error	t-value	p-value
Intercept	0.182	0.062	2.935	0.004
Political Factors	0.301	0.082	3.902	0.001
Financial Constraints	0.216	0.076	3.245	0.002
Institutional and Human Capacity	0.137	0.064	2.923	0.004
Technological Challenges	0.112	0.058	2.327	0.021

Coefficients (β) were examined to determine the magnitude and direction of each factor's effect on policy implementation.

RESULTS AND DISCUSSION

Multiple Regression Model

Dependent Variable: Implementation of surface transport policy

Independent Variables: Political Factors, Financial Constraints, Institutional and Human Capacity Issues, Technological Challenges, and Differing Expectations from Stakeholders

The Multiple Regression Model follows as:

Y = β0 + β1X1 + β2X2 + β3X3 + β4X4 + β5X5 + ϵ

Implementation = β0 + β1 x Political Factors + β2 Financial Constraints + β3 x Institutional Issues + β4 x Technological Challenges + β5 x Stakeholder Expectations + ϵ

The model developed for estimating respondents' opinions uses the five composite factors derived from the factor analysis above as independent variables. Because there are multiple categories of the dependent variable it was necessary to choose a base category as a comparison group. The last level of acceptance category "strongly disagree" was selected as a base category. The results of the multiple regression analysis are presented in Tables 4.2 below.

Stakeholder Expectations	0.228	0.078	3.435	0.001

Interpretation

The multiple regression model used to analyze the data is given by:

$Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \beta5X5 + \epsilon$

Where Y represents the dependent variable of interest, X1,X2, X3, X4, and X5, denote the independent variables included in the model, β0,β1,β2, β3, β4, and β5 are the coefficients associated with each independent variable, and ϵ is the error term.

i. The intercept coefficient (0.182) represents the baseline level of implementation of surface transport policy when all other factors are zero.
ii. All independent variables (factors) have positive coefficients, indicating that higher scores on these factors are associated with increased implementation of surface transport policy.
iii. The coefficients for Political Factors, Financial Constraints, and Stakeholder Expectations are statistically significant at the 0.05 level, suggesting that these factors have higher impact on the implementation of surface transport policy.
iv. The coefficients for Institutional and Human Capacity and Technological Challenges are also significant at the 0.05 level, albeit with slightly lower t-values, indicating a somewhat weaker but still meaningful impact on policy implementation.

Overall Model Fit

R-squared: 0.649
Adjusted R-squared: 0.625
F-statistic: 26.89 ($p < 0.001$)

The regression model explains approximately 64.9% of the variance in the implementation of surface transport policy, suggesting that the included factors collectively provide a good fit to the data.

Findings `

The regression analysis indicates that Political Factors, Financial Constraints, Institutional and Human Capacity, Technological Challenges, and Stakeholder Expectations significantly influence the implementation of surface transport policy in Nigeria. Policymakers and stakeholders should focus on addressing these factors to enhance the effectiveness and success of surface transport policy implementation efforts.

TEST OF HYPOTHESIS

Ho1: Each limiting factor has no significant effect on the implementation of surface transport policy.

The factor analysis results indicate that each of the limiting factors significantly contributes to the variation in the implementation of surface transport policy in Nigeria. The percentage contribution of each factor to the total variance can be calculated using the formula:

$$Percentage\ Contribution\ of\ Factor_i = \left(\frac{Variance\ Explained\ by\ Factor_i}{Total\ Variance\ Explained\ by\ All\ Factors}\right) \times 100$$

Where:

- Variance Explained by $Factor_i$ is the amount of variance explained by the individual factor i.
- Total Variance Explained by All Factors is the sum of the variances explained by all factors.

Upon application of the formula, the contribution of each factor is:

- Political Factors contribute 30.1%
- Financial Constraints contribute 21.6%
- Institutional and Human Capacity Issues contribute 13.7%
- Technological Challenges contribute 11.2%
- Stakeholder Expectations contribute 22.8%

This result contradicts Ho1, suggesting that each factor does indeed have a significant effect on policy implementation. Therefore, we reject Ho1 and accept the alternative hypothesis.

Conclusion:

The study examined each factor limiting implementation of public surface transport policy in Nigeria. Through regression analysis several key insights have emerged. Firstly, navigating political complexities, addressing funding limitations, and managing stakeholder expectations are crucial for effective policy implementation in the transport sector.

Furthermore, investments in human capital, institutional strengthening, and technological innovation are essential to overcoming implementation barriers. Capacity-building initiatives and the development of indigenous technological solutions play pivotal roles in enhancing policy implementation outcomes. The regression analysis revealed that Political Factors, Financial Constraints, Institutional and Human Capacity, Technological Challenges, and Stakeholder Expectations significantly influence the implementation of surface transport policy in Nigeria. Stakeholder Expectations emerged as the most influential factor, followed by Political Factors and Financial Constraints.

Overall, the findings underscore the complexity of policy implementation in the transport sector and emphasize the need for comprehensive strategies to address the identified limiting factors. Policymakers and stakeholders must prioritize collaborative decision-making processes,

Recommendations:

1. **Further Investigation into Political Dynamics:** Conduct in-depth research to explore the intricacies of political influence on surface transport policy implementation in Nigeria. This could involve qualitative studies, interviews with key stakeholders, and analysis of political decision-making processes to gain a comprehensive understanding of the challenges and opportunities presented by political factors.
2. **Policy Evaluation and Reform:** Evaluate existing transport policies in

Nigeria to identify areas for improvement and reform. This could involve comparative analyses with policies from other countries, stakeholder consultations, and expert assessments to develop evidence-based recommendations for policy adjustments.

3. **Financial Resource Allocation:** Investigate strategies for optimizing financial resource allocation to the transport sector in Nigeria. This may include assessing budgetary allocations and evaluating the effectiveness of financial management practices in ensuring sufficient funding for policy implementation.
4. **Technological Innovation and Adoption:** Explore opportunities for leveraging technological innovations to address implementation challenges in the transport sector..
5. **Stakeholder Engagement Strategies:** Investigate best practices for stakeholder engagement and communication in the context of surface transport policy implementation..

REFERENCE

Aderamo, A.J. (2012e). Transport infrastructure and the Nigerian Environment. International Review of Business and Social Sciences, 1(6), pp.49-66.

Adetola, A., Goulding, J., &Liyanage, C. (2013) Road Transport Infrastructure Management in Selected Countries.

Adetola,A.E(2014).A Conceptual Collaborative Engagement Framework for Road Infrastructure Management in Nigeria. PhD, Thesis is submitted to the University of Central Lancashire, United Kingdom.

Adetunji, M.A. (2014). Maintenances of Urban Roads Infrastructure in a Medium Sized City in North Central Nigeria.Romanian Review of Social Sciences, 7, pp.23-37.

Adeyeye,A.(2022).Understanding Public Policy and Good Governance in Nigeria.www.researchgate.net/publication.March,2022.

Akpogomeh, O.S. (2012). The Terror of Transport and the Transportation of Terror.Inaugural Lecture Series, No. 94, University of Port Harcourt, Nigeria. Available at Accessed 20th May 2013.

Anyanwu J.C. 2013.The correlates of poverty in Nigeria and policy implications. African Journal of Economic and Sustainable Development vol. 2 no. 1, pp. 23-52.

Ariyo .A. &Oyedepo, O. J. (2017).Public Transport Policy in Developing Countries: Nigeria as a case study.Futa Journal.

Babatunde, I. (2020) The Policy Institutional Approach to Transport Failure in Nigeria. Open Access Library Journal, **7**, 1-18. doi: 10.4236/oalib.1105996.

Ben. A. I. (2018). Policy Development and Implementation in Nigeria Federal System.www./researchgate.net/publication.

Blomberg.(2017). Philanthropies. "America Pledge; States, Cities, Businesses in the United States are stepping up on Climate Action".

Burns, N. H., & Grove, J. W. (2003).Experimental Assessment of Factors Affecting Transfer Length. Structural Journal, 100, 740-748. https://doi.org/10.14359/12840

Challenges and Sustainable Prospects.

Chetty, Priya&Datt, Shruti.(2015).Frequency analysis with SPSS.

Claudia, N. B,Uwe,D., Yishen, L. & Harris, S.(2017).Transport Policies and Development. The Journal of Development Studies.Vol.53, No.4.

Dahida, D.P &Maidoki, B.P, (2013).Public Policy Making and Implementation in Nigeria. Connecting the Nexus.www.iiste.org, Vol.3,No. 6,2013.

Danjuma Samuel (2013) "Spatial Planning Framework for Urban Development and Management in Jos Metropolis Nigeria" PhD Thesis submitted to School of the Built Environment, College of Science and Technology University of Salford, Greater Manchester, United Kingdom.

Edema J.E(2019), Poor Public Transport Infrastructure in Lagos Nigeria, How Sustainable Improvement could enhance well-being of the people and provide environmental benefits.thesis for Bachelor of Natural Resources Degree programme in Sustainable Coastal Management. Ekenäs, 2019.

Federal Capital Territory, Nigeria. Journal of Sustainable Development, 5(12), pp.117-128

Federal Government of Nigeria (2012) ''Nigeria's Path to Sustainable Development through Green Economy. Country Report to the Rio + 20 Summit June 2012

Federal Ministry of Works Gazette,2012 to 2023.

Federal Road Maintenance Agency Gazette.

Femi S.A.G. 2012. Characterization of current transportation challenges in the Federal Capital Territory, Nigeria. Journal of Sustainable Development vol.5 no.12, pp.117-128.

FGN (Federal Government of Nigeria) (2011). A brief on the national transportation sector: Report of the Federal Republic of Nigeria. Available at Accessed 30th March 2013.

Gugler (1997) Cities in the developing world: Issues, theory, and policy. Website: www.getcitied.org/pub/100139182

Gungul, T. (2012). Road traffic accidents in Nigeria: Causes and control. Journal of Applied Science and the Environment, 3, pp.25-29. ISSN: 2141-1360.

Gunn,L,A.,1978.Whyisimplementationsodifficult?ManagementServicesinGovernment 33, pp. 169-176.

I.M.Schoeman,(2018).'An Approach to Resilience in Transportation Planning.Sustainability Journal Publication.

Ison,S.,Rye,T.,2003.Lessonsfromtravelplanningandroaduserchargingforpolicy-making: through imperfection to implementation. Transport Policy, 10(3), pp. 223-233.

Marume, S. B. M.(2016),Public Policy and Factors Influencing Public Policy. International Journal of Engineering Invention.www.ijesi.org.Vol.5.Issue 6.

Momoh,. J. U, (2016). Sustainable urbanism and its assessment in developing countries: the nigerian case, PhD these submitted to nottinghamtrent university..

National Bureau of Statistics, Nigeria, 2012.Annual Abstract of Statistics, 2012.

NPC (National Population Commission). 2014. Gender in Nigeria: Data from the 2013 Nigeria Demographic and Health Survey. DHS Program. Rockville, United States of America.

NRC generated N3bn from train services in 2019 - MD". pulse.ng. 2020-08-07. Retrieved 2021-12-04.

Obamwonyi, S.E.& Aibieyi,S.(2014).Public Policy Failures in Nigeria: Pathway to Underdevelopment. Journal of Policy and Development Studies.Vol.9,No.1.November,2014.

Ogunbodede E. F. (2008). Urban Road Transportation in Nigeria From 1960 To 2006: Problems, Prospects And Challenges. Ethiopian Journal of Environmental Studies and Management, 1(1), pp.1-12

Onatere-Ubrurhe, J. O (2016), Developing a Benchmarking Methodology for the Nigerian Transport sector. A PhD thesis submitted to the university of Wolverhampton.

Oni S.I., Okanlawon K.R. 2011. Transport planning in Nigeria: A plea for incorporating the gender factor. Journal of Social Sciences vol. 29 vol. 2, pp. 177_182.

Onimisi,T.&S.H.Osasona, (2021), Factors affecting effective policy implementation in Nigeria: focus on federal character principle.www. researchgate.net/publication/June/2021.

Oresanya, O. (2015). The Lagos megacity project: the way forward: Lagos State Publishing.

Oroleye,A.K.(2019).Appraisal Of Road Transport Policy Reform In Nigeria: A Case Of Infrastructural Deficit. Journal of Governance and Public Policy.Vol.6.N0.3.October,2019.

Oyesiku, K. (2011). ‘‘Development before town planning, the cause of flooding in Nigeria’’. Retrieved from Oyeyemi B. 2017. Sharing the Nigerian experience: Case study of the World Bank safe corridor project.SSATP Annual Meeting and Associated Experience Sharing Events. Marrakech, Morocco.

Papacostas, C. S, &Prevedours, P. D.(2012). ‘Transportation Engineering & Planning (third edition).University of Hawail.

Paulina Muratone. (2018). “Planning for Low-Carbon Urban Transport Systems”.

Road runner mobility Tech.ltd,2023.

Rode,P.,Heeckt,C.,daCruz,N.F. (2019).NationalTransportPolicyandCities:Keypolicyinterventionstodrivecompactandconnectedurban

Rodrigue,Notteboom,Slack,(2020).The Geography of Transport Systems. Fifth

Solanke.M.O (2013).Challenges of urban transportation in Nigeria.International Journal of Development and Sustainability.

SSATP (2018),Africa Transport Policy Program. Policies for Sustainable Accessibility and Mobility in Urban Areas of Nigeria.

Sumaila, A. F.(2013).Building sustainable policy framework for development: A review of national transport policy initiatives in Nigeria.International Journal of Development Sutainability/Vol,2.No.2(2013).

The Norwegian National Transport Plan 2018-2029 (viewed 1 February 2019available at:https://www.ntp.dep.no/Forside/plangrunnlag-nasjonaltransportplan-2018-2029.

Ugwuanyi,B.1&Chukwuemeka, E.O.(2013).The Obstacles of Effective Policy Implementation by the the Public Bureaucracy in Developing Nations. The case of Nigeria.Singaporean Journal of Business Economics and Management Studies.Vol.1.No.8.2013.

United Nations, Department of Economic and Social Affairs, Population Division. 2015. World Urbanization Prospects: The 2014 Revision, Highlights. New York: United Nations.

Uzoho ,M.C&Okeudo, G.N.(2021).The Effect of Fleet Maintenance Activities on the Profitability of Transport Firms in Nigeria. Emerald International Journal Of Scientific and Contemporary Studies.www.emerald academics.com.Vol.1.No.1.February, 2021.

William, A. A.(2016).The Impact of Transportation Infrastructure in Nigeria's Economic Development. Walden University.

World population review.(United Nations data 2020,2021).

Yin, R. K. (2013). Case study research: Design and methods. Sage publications.

Patrick Mulyungi (2021-08- 14). "Port Harcourt-Maiduguri rail line reconstruction project flagged off". Thisday.Retrieved 2021-12-04.

Guardian, News of 3rd March,2022.

Nrc-ng.org".nrc-ng.org.Retrieved 2022-04-24.

RANKING THE EFFECT OF THE FACTORS LIMITING IMPLEMENTATION OF SURFACE TRANSPORT POLICY.

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ABSTRACT: *This research ranked the effect of the Factors Limiting Implementation of Public Surface Transport Policy in Nigeria. The collapse of inter-modal transportation and the increased pressure on roads highlights limitations in policy implementation. Using cross-sectional research design, data were collected from stakeholders (ministries) in charge of road and rail construction and maintenance. Structured questionnaires comprising 20 items to identify factors limiting implementation of Public surface Transport policy in Nigeria were quantitatively adopted. Using Statistical analyses; factor analysis and regression modeling, the impact of these limiting factors on the implementation of public surface transport policy were substantially established. Based on the coefficients obtained from the regression analysis result: findings ranked the effect of the factors limiting implementation of surface transport policy as follows: Political Factors (Coefficient: 0.301),Stakeholder Expectations (Coefficient: 0.228),Financial Constraints (Coefficient: 0.216), Institutional and Human Capacity (Coefficient: 0.137) and Technological Challenges (Coefficient: 0.112).Recommendations for policymakers and administrators include reforming existing policies, optimizing financial resource allocation, investing in human capital, fostering technological advancement, and promoting inclusive decision-making processes. These are actionable insights to inform policy reforms and enhance the effectiveness of transportation infrastructure development initiatives.*

Keywords*: factors limiting, Implementation, Public, Surface, Transport Policy.*

Background Information

Governments enact regulations, infrastructure policies, pricing policies, and land-use policies to guide the transport sector for policy formulation and implementation (Williams, 2016).

Marume's (2016) definition characterizes Public Surface Transport Policies as comprehensive frameworks comprising principles, regulations, guidelines, rules and laws established by government to govern the planning, operation, management of Public Surface transportation systems so as to realize long-term goals for an efficient and accessible public surface transportation services. However, the challenge often lies in the proper implementation of these policies.

Babatunde (2020) highlights the central role of the government and its agencies in the process of policy formulation and implementation in Nigeria. Despite the potential involvement of civil society organizations in principle, their actual participation in policy processes remains limited in practice. Policy formulation, as an instrumental tool employed by both public and private organizations, addresses existing problems, and aims to prevent their recurrence through articulated goals and objectives. (Babatunde, 2020).

The history of transport policy in Nigeria reveals a series of policy documents and reforms aimed at addressing the malfunctioning of the nation's transport system. The emergence of the 1993 document, as the first National Transport Policy with its thrust on modal development led to the 2003, 2008, and 2010 reforms. These reforms sought to address issues of modal development, integrated intermodal development, deregulation, privatization, and public-private partnership. However, the gap between policy formulation and effective implementation persisted, resulting in the deterioration of facilities in the transport sector, especially in surface transportation. (Sumalia, 2013).

The latest reform in 2010 aimed at institutionalizing the transport system through the creation of central coordinating centers, but thirteen years post-reform, the lofty goals and objectives for the transport sector, particularly surface transportation, remain largely unattainable. This gap between policy formulation and implementation has resulted in a crisis in Nigeria's transport system, marked by a lack of integration among various transport modes, inefficiencies, accidents, and high maintenance costs (Oladipo, 2016).

Road transportation involves interrelationships between the physical environments, models of political and social activity, and economic development status. (Oroleye,2019).Unlike other modes, road transportation has improved most of the world's population mobility and accessibility tremendously(Oni,2011).

Road infrastructure is described as a set of roads arranged in the form of a network linking the inhabited parts. As the population of an area increases, the intensity of human activities becomes significant, and the road network is more congested. (Babatunde,2020).

Lack of a specific policy statement on how the rail system/ railway should develop and the role to be performed within the economy constituted severe problem for the rail system in Nigeria. The allocation of funds to the transport system that favored the highways has left the rail mode in precarious conditions and there is need to amend the status of the Corporation (Wikipedia,2023)

One of the major transportation problems in Nigeria is the inadequate integrated intermodal system like railroads. The absence of utilitarian railways interfacing the ports to significant urban areas has constrained merchant to transport their merchandise and product completely by road. The challenges faced by the transport sector are multifaceted, encompassing poor maintenance culture, underinvestment, and a decline in capital spending on transport development programs since the 1980s (Babatunde, 2020). The transformation of the transport sector is not only an economic imperative but also a crucial step toward alleviating poverty and promoting sustainable development in Nigeria. Identifying the policy issues that hinder the effective delivery of transport solutions is essential for devising strategies that ensure efficient and sustainable transport systems.

Problem Statement

The state of rail/road transport infrastructure in Nigeria, particularly the federal highways and railways, stands at a critical juncture. Despite the comprehensive policy reforms initiated through the National Transport Policy (NTP) in 1993, 2003, 2008, and 2010, the condition of rail tracks/federal highways remains deplorable, and the infrastructural deficit persists. As of 2010, the federal highway network, comprising 34,123 km of major roads and critical bridges, faced challenges such as overuse, lack of

maintenance, and a staggering 50% in poor condition (Buhari, 2000; FGN, 2010). Additionally, State and Local Government roads, constituting most of the road network, were also in suboptimal conditions, highlighting a systemic issue in the overall transport infrastructure (Buhari, 2000).

The constitutional distribution of responsibilities for road planning, development, and maintenance among the three tiers of government—Federal, State, and Local—has not translated into effective management of the nation's road network.

The allocation of funds to the transport system that favored the highways has left the rail mode in precarious conditions. There is need to amend the status of the Corporation, giving the management the needed powers. Appointments to the executive level of the Rail Corporation should be based on merit jettisoning the practice of employing persons on political or ethnic ground. Despite the existence of agencies like the Federal Ministry of Transport, Federal Ministry of Works, and the Federal Road Maintenance Agency (FERMA), the impact on ground has been minimal, raising questions about the effectiveness of the institutional arrangements in place (Federal Republic of Nigeria's Constitution, 1999).

While successive Nigerian governments have introduced National Transport Policies to address the growing demand for transportation and promote sustainability, the policy reforms have fallen short of achieving significant improvements/implementations. The collapse of the railway system and the subsequent increased pressure on roads highlights the inadequacies of the existing transport policies. Notable studies by Buhari (2000), Sumaila (2013), Agbonkhese et al. (2013), and Igwe et al. (2013) have reviewed the national transport policy but failed to link the deteriorating state of Rail tracks/ federal highways to the limitations and weaknesses imposed by the national transport reform document.

This study aims to evaluate each factor limiting the effective implementation of public surface transport policy in Nigeria, Although several policies have been beautifully crafted in the past as contained in the NTP, 2003, 2008, and 2010 documents, a lack of coordinated effort has hindered the effectiveness of implementing these policies.

Objective of Study

1. To Rank the effect of the factors limiting implementation of surface transport policy.

Research Question

1. How can the factors be ranked with respect to their effect on implementation?

Scope of Study

The scope of this study is defined by its focus on the surface transportation sub-sector, encompassing both road and rail infrastructure, within the geographic context of the six geo-political zones of Nigeria.

Justification of study

The justification of this study lies in its potential to address critical issues within the surface transportation sector in Nigeria. By ranking the effects of the factors limiting the effective implementation of public surface transport policy, particularly focusing on federal highways and railways the study aims to provide valuable insights and contribute to several areas.

Conceptual Framework

Oroleye, (2019) defined public policy as the proposed course of action of the government or one of its divisions. It is also defined as the authoritative allocation of values to the whole society. Policy formulation is an instrument

that is used both by public and private organizations to address existing challenges or imbalances and safeguard the re-occurrence of such in the nearest future through articulated goals and objectives as contained therein. A draft of the National Transport Policy was prepared in 1965, it was not adopted. Observed extreme malfunctioning of the nation's transport system and the associated problems lead to the emergence of the 1993 document, as the first National Transport Policy with its thrust on modal development.

The realization of the fact that the aspiration contained in this document seemed inadequate to transform the dynamics and ever-changing transport sector environment nationally led to the 2003, 2008 and 2010 reforms which paid attention to integrated intermodal development, deregulation, privatization, and public-private partnership respectively. Policy reform is a condition that prevails on policymakers to effect changes on a policy after discovering some lapses. This in effect did not imply that during the period, efforts were not made to improve and maintain the system and make it functional, but the overall demand for transport services and use of roads in Nigeria seems to exceed the supply. This situation requires urgent remedies to effect needed changes and improvement in the transport sector and particular road transportation in Nigeria.(Sumalia,2013).

The 2008 reform was short-lived as the need for its re-engineering of policy goals and objectives in line with social, economic and technological reality informed the emergence of 2010 National Policy document which suffers the same faith and remains essentially as a draft with the previous policies, but its contents are being implemented.(Oni,2011).

The 2010 National Transport reform is aimed at institutionalizing transport system through the creation of central coordinating centers to administer its affairs. Despite the various policy document reforms, the transport sector and road transport mode witnessed deterioration in facilities nine years after the last reform, not much could be said to have been achieved in the transport sector in general and road sub-sector in particular. The lofty general policy goals and objectives for the transport sector and in particular the road transportation seem unattainable. As many of the Federal highways and bridges in Nigeria and expressways, are characterized with large potholes and failed portions which slow down movements and expose users to frequent accidents with the attendant loss of lives and properties. (Sumalia,2013).

According to the Federal Republic of Nigeria's Constitution (1999) the responsibility of the planning, developing and maintaining the nation's transport infrastructure is shared among the three tiers of Government. To this end, intra-state roads are the responsibility of State Governments; Local Governments are required to cater for intra-urban and rural feeder roads, while the Federal Government, through Federal Ministry of Transport, Federal Ministry of Work and Federal Road Maintenance Agency (FERMA), is responsible for the maintenance of national highways which constitute only 17% of the existing road network in Nigeria. Despite the lopsided institutional arrangement, the impact of the three tiers of government and the Federal Government, remained minimal as the condition of Nigerian roads has become deplorable and inadequate, notwithstanding the reform put in place. (UN.Habitat, 2015).

Table 1: BARRIERS TO IMPLEMENTATION OF TRANSPORT POLICY INTERVENTIONS

Barriers	Transport policy example
Political	Political cycles and timescales: Short-term gains twisted with long-term goals, e.g. dependence on urban periphery land sales to raise revenue works against long-term land holding and strategic compact growth / development restrictions Public acceptability: Negative response to introducing user charges to "free" goods (not showing real social and environmental costs), e.g. street parking charges Vested interests: Powerful lobbies that hinder change, e.g. car industry lobbying against sustainable transport regulation or motorist groups blocking allocation of road space for cycling lanes Consumer preferences: The extent that attitudes influence transport policy and funding options, e.g. user perceptions of mass transport as opposed to personal car use Risk aversion: Reluctance to change the status quo (worried about backlash) resulting in a narrowing of policy considerations, e.g. removing licence plate or registration caps/auctions/restrictions from consideration as a supply management measure Rigid rules: Lack of flexibility to address local context, e.g. minimum parking space standards prevent land owners and developers from limiting the parking they provide in walk able, transport-rich areas
Financial	Financial resources: Policy option restricted as a result of insufficient capital budgets, e.g. debt instruments for new mass transport infrastructure
Institutional and human capacity	Knowledge and skills: Insufficient experience or training in new approaches to urban design or service provision, e.g. unable to introduce flexible performance-based standards for road widths and layouts in place of conventional design engineering standards Institutional arrangements: Levels of centralized or decentralized decision-making and authority that affect policy choices, e.g. cities unable to implement central city congestion charging due to restrictions on local revenue-raising from national governments
Technical	Uncertainties: Lack of clarity on technology evolution and risk from picking early winners, e.g. reluctance of government to invest in alternative fuel refilling facilities such as for hydrogen vehicles (potentially slowing market transformation) Other technical barriers: Key technologies, e.g. cameras/scanners and collection systems for road pricing, are prohibitively expensive for lower-income countries

Source: (Rode, P., Heeckt, C., da Cruz, N.F. 2019).

Theoretical Framework:

Diffusion of Innovations Theory: This theory explores how new ideas, practices, and technologies spread within a society or organization. In the context of surface transport policy, resistance to change, lack of awareness or understanding of innovative solutions, and slow adoption of best practices may impede effective implementation.

Political Economy Theory: This theory examines the interactions between political and economic forces in shaping public policy decisions and outcomes. Factors such as vested interests, corruption, and rent-seeking behavior within the transport sector could influence policy implementation processes and outcomes.

Institutional Capacity Theory: This theory emphasizes the importance of organizational capacity, capabilities, and resources in achieving policy objectives. Factors such as weak regulatory enforcement, insufficient technical expertise, and inadequate monitoring and evaluation mechanisms may undermine the implementation of surface transport policies.

These theories provide different lenses through which to analyze the limiting factors of implementing surface transport policy, highlighting the multifaceted nature of the challenges involved.

Table 2: REVIEW OF IDENTIFIED FACTORS LIMITING IMPLEMENTATION OF PUBLIC SURFACE TRANSPORT POLICY IN NIGERIA

S/N	IDENTIFIED FACTORS	REVIEW OF EACH IDENTIFIED FACTOR
1.	POLITICAL FACTORS	Short-term political gains conflicting with long-term goals Excessive political influence on decision-making Hindrance due to transitioning political Governments Balancing political interests sustainably. (Ben,2018)
2.	STAKEHOLDERS DYNAMICS	Collaboration in policy implementation among stakeholders Hindrance due to non-involvement of key actors Influence of stakeholder expectations on implementation Uniform interpretation of policy by stakeholders (Oroleye, 2019)
3.	FINANCIAL CONSTRAINTS	Financial limits on infrastructure investments Hindrance due to financial challenges Satisfaction with allocated funds Exploration of alternative funding sources. (Rode, P., Heeckt, C., da Cruz, N.F. 2019).
4.	INSTITUTIONAL AND HUMAN CAPACITY	Knowledge gaps in transport ministries Need for capacity-building initiatives Effectiveness of institutional structures

		Unsatisfactory coordination among institutions. (Dahida&Maidoki, 2013)
5.	TECHNOLOGICAL CHALLENGES	Technological barriers hindering implementation. Overreliance on imported technology Impact of insufficient research and development (R&D) Potential of technological innovations. (Rode, P., Heeckt, C., da Cruz, N.F. 2019).
6.	AGITATIONS/INSERCURITY	The unrest, killings, protest and different demands of the various proscribed and non-proscribed groups at the six geo-political states in Nigeria are indeed one of the most current factors hindering and affecting the implementation of some good will policies, laws, regulations in the Nation. (Source: Author).
7.	EXTERNAL PRESSURE	The external pressures and actors, consisting of international and regional organizations, non – governmental organizations and significant others contribute to policy formulation through their own influences; the provision of information and data; the supply of technical assistance; and the spread of philosophies and success stories in other countries and areas. Amongst the main influential, external sources of government policies are the donors, through their expertise, aid, and technology. (Marume,2016)

SOURCE: AUTHOR (2024)

Research Design and Strategy
Cross-Sectional Research Design
This design involves collecting data from a sample of participants at a single point in time and gathering data across a specified time frame. In the context of this study, it means that data is collected from respondents representing different experience levels at a specific time frame. This approach allows for the examination of relationships between public policies implementation and surface transport at a snapshot in time.

Study Area
The study area involves ministries responsible for Road and Rail construction and maintenance. The ministries include Federal Ministry of Works and Housing (FMWH), Federal Roads Maintenance Agency (FERMA), Nigerian Railway Corporation (NRC).

Data Collection Method and Data Analysis Tool for Objective:
To rank the effect of the factors limiting implementation of surface transport policy.

Data Collection Method

Coefficients obtained from the regression analysis will be used to rank the factors based on their effect on policy implementation.

Data Analysis Tools - Coefficient Examination

Coefficients obtained from factor analysis will be examined to rank the effect of factors on policy implementation. The Coefficient

Examination model used in this study is represented by the following equation:

$$t = \frac{\hat{\beta}_j}{SE(\hat{\beta}_j)}$$

Where:

- t is the test statistic for the coefficient.
- β^j is the estimated coefficient for predictor j.
- SE(β^j) is the standard error of the coefficient.

Factors will be ranked based on the magnitude of their coefficients, with higher coefficients indicating a greater effect on policy implementation.

RESULTS AND DISCUSSION

Table 3: Coefficients Result from Multiple Regression Analysis.

Variable	Coefficient (β)
Intercept	0.182
Political Factors	0.301
Financial Constraints	0.216
Institutional and Human Capacity	0.137
Technological Challenges	0.112
Stakeholder Expectations	0.228

Coefficient Ranking:

Y = β0 + 0.301 (Political Factors) + 0.216 (Financial Constraints) + 0.137 (Institutional and Human Capacity) + 0.112 (Technological Challenges) + 0.228 (Stakeholders Expectations)+ϵ

Based on the coefficients obtained from the regression analysis result in Table 2 and above, we can rank the effect of the factors on the implementation of surface transport policy as follows:

1. Political Factors (Coefficient: 0.301)
2. Stakeholder Expectations (Coefficient: 0.228)
3. Financial Constraints (Coefficient: 0.216)
4. Institutional and Human Capacity (Coefficient: 0.137)
5. Technological Challenges (Coefficient: 0.112)

These rankings are based on the magnitudes of the coefficients obtained from the regression analysis. Factors with larger coefficients have a greater effect on the implementation of surface transport policy compared to factors with smaller coefficients. Therefore, Political Factors is ranked highest as it has the largest coefficient, followed by Stakeholder Expectations, Financial Constraints, Institutional and Human Capacity, and finally Technological Challenges.

Conclusion:

The study ranked the effect of the factors limiting implementation of public surface transport policy in Nigeria. Through regression analysis several key insights have emerged. Firstly, navigating political complexities, addressing funding limitations, and managing stakeholder expectations are crucial for effective policy implementation in the transport sector.

Furthermore, investments in human capital, institutional strengthening, and technological

innovation are essential to overcoming implementation barriers. Capacity-building initiatives and the development of indigenous technological solutions play pivotal roles in enhancing policy implementation outcomes. The regression analysis revealed that Political Factors, Financial Constraints, Institutional and Human Capacity, Technological Challenges, and Stakeholder Expectations significantly influence the implementation of surface transport policy in Nigeria. Political Factors emerged as the most ranked factor, followed by Stakeholder Expectations, Financial Constraints, Institutional and Human Capacity and Technological Challenges.

Overall, the findings underscore the complexity of policy implementation in the transport sector and emphasize the need for comprehensive strategies to address the identified limiting factors. Policymakers and stakeholders must prioritize collaborative decision-making processes.

Recommendations:

1. **Further Investigation into Political Dynamics:** Conduct in-depth research to explore the intricacies of political influence on surface transport policy implementation in Nigeria. This could involve qualitative studies, interviews with key stakeholders, and analysis of political decision-making processes to gain a comprehensive understanding of the challenges and opportunities presented by political factors.
2. **Stakeholder Engagement Strategies:** Investigate best practices for stakeholder engagement and communication in the context of surface transport policy implementation. This could involve surveys, focus groups, and interviews to gather stakeholder perspectives and identify strategies for fostering collaboration and consensus-building among diverse stakeholders.
3. **Financial Resource Allocation:** Investigate strategies for optimizing financial resource allocation to the transport sector in Nigeria. This may include assessing budgetary allocations, exploring alternative funding sources, and evaluating the effectiveness of financial management practices in ensuring sufficient funding for policy implementation.
4. **Capacity-building Initiatives:** Research the effectiveness of capacity-building initiatives in enhancing the implementation of surface transport policies. This could involve case studies of capacity-building programs, evaluations of training methods, and assessments of the impact of capacity-building on policy outcomes.
5. **Technological Innovation and Adoption:** Explore opportunities for leveraging technological innovations to address implementation challenges in the transport sector. This may include studies on the adoption of emerging technologies, assessments of technological barriers, and analyses of the potential impact of innovation on policy implementation effectiveness.

REFERENCE

Aderamo, A.J. (2012e). Transport infrastructure and the Nigerian Environment. International Review of Business and Social Sciences, 1(6), pp.49-66.

Adetola, A., Goulding, J., &Liyanage, C. (2013) Road Transport Infrastructure Management in Selected Countries.

Adetola,A.E(2014).A Conceptual Collaborative Engagement Framework for Road Infrastructure Management in Nigeria. PhD, Thesis is submitted to the University of Central Lancashire, United Kingdom.

Adetunji, M.A. (2014). Maintenances of Urban Roads Infrastructure in a Medium Sized City in North Central Nigeria.Romanian Review of Social Sciences, 7, pp.23-37.

Adeyeye,A.(2022).Understanding Public Policy and Good Governance in Nigeria.www.researchgate.net/publication.March,2022.

Akpogomeh, O.S. (2012). The Terror of Transport and the Transportation of Terror.Inaugural Lecture Series, No. 94, University of Port Harcourt, Nigeria. Available at Accessed 20th May 2013.

Anyanwu J.C. 2013.The correlates of poverty in Nigeria and policy implications. African Journal of Economic and Sustainable Development vol. 2 no. 1, pp. 23-52.

Ariyo .A. &Oyedepo, O. J. (2017).Public Transport Policy in Developing Countries: Nigeria as a case study.Futa Journal.

Babatunde, I. (2020) The Policy Institutional Approach to Transport Failure in Nigeria. Open Access Library Journal, **7**, 1-18. doi: 10.4236/oalib.1105996.

Ben. A. I. (2018). Policy Development and Implementation in Nigeria Federal System.www./researchgate.net/publication.

Blomberg.(2017). Philanthropies. "America Pledge; States, Cities, Businesses in the United States are stepping up on Climate Action".

Burns, N. H., & Grove, J. W. (2003).Experimental Assessment of Factors Affecting Transfer Length. Structural Journal, 100, 740-748. https://doi.org/10.14359/12840

Challenges and Sustainable Prospects.

Chetty, Priya&Datt, Shruti.(2015).Frequency analysis with SPSS.

Claudia, N. B,Uwe,D., Yishen, L. & Harris, S.(2017).Transport Policies and Development. The Journal of Development Studies.Vol.53, No.4.

Dahida, D.P &Maidoki, B.P, (2013).Public Policy Making and Implementation in Nigeria. Connecting the Nexus.www.iiste.org, Vol.3,No. 6,2013.

Danjuma Samuel (2013) "Spatial Planning Framework for Urban Development and Management in Jos Metropolis Nigeria" PhD Thesis submitted to School of the Built Environment, College of Science and Technology University of Salford, Greater Manchester, United Kingdom.

Edema J.E(2019), Poor Public Transport Infrastructure in Lagos Nigeria, How Sustainable Improvement could enhance well-being of the people and provide environmental benefits.thesis for Bachelor of Natural Resources Degree programme in Sustainable Coastal Management. Ekenäs, 2019.

Federal Capital Territory, Nigeria. Journal of Sustainable Development, 5(12), pp.117-128

Federal Government of Nigeria (2012) ''Nigeria's Path to Sustainable Development through Green Economy. Country Report to the Rio + 20 Summit June 2012

Federal Ministry of Works Gazette,2012 to 2023.

Federal Road Maintenance Agency Gazette.

Femi S.A.G. 2012. Characterization of current transportation challenges in the Federal Capital Territory, Nigeria. Journal of Sustainable Development vol.5 no.12, pp.117-128.

FGN (Federal Government of Nigeria) (2011). A brief on the national transportation sector: Report of the Federal Republic of Nigeria. Available at Accessed 30th March 2013.

Gugler (1997) Cities in the developing world: Issues, theory, and policy. Website: www.getcitied.org/pub/100139182

Gungul, T. (2012). Road traffic accidents in Nigeria: Causes and control. Journal of Applied Science and the Environment, 3, pp.25-29. ISSN: 2141-1360.

Gunn,L,A.,1978.Whyisimplementationsodifficult?ManagementServicesinGovernment 33, pp. 169-176.

I.M.Schoeman,(2018).'An Approach to Resilience in Transportation Planning.Sustainability Journal Publication.

Ison,S.,Rye,T.,2003.Lessonsfromtravelplanningandroaduserchargingforpolicy-making: through imperfection to implementation. Transport Policy, 10(3), pp. 223-233.

Marume, S. B. M.(2016),Public Policy and Factors Influencing Public Policy. International Journal of Engineering Invention.www.ijesi.org.Vol.5.Issue 6.

Momoh,. J. U, (2016). Sustainable urbanism and its assessment in developing countries: the nigerian case, PhD these submitted to nottinghamtrent university..

National Bureau of Statistics, Nigeria, 2012.Annual Abstract of Statistics, 2012.

NPC (National Population Commission). 2014. Gender in Nigeria: Data from the 2013 Nigeria Demographic and Health Survey. DHS Program. Rockville, United States of America.

NRC generated N3bn from train services in 2019 - MD". pulse.ng. 2020-08-07. Retrieved 2021-12-04.

Obamwonyi, S.E.& Aibieyi,S.(2014).Public Policy Failures in Nigeria: Pathway to Underdevelopment. Journal of Policy and Development Studies.Vol.9,No.1.November,2014.

Ogunbodede E. F. (2008). Urban Road Transportation in Nigeria From 1960 To 2006: Problems, Prospects And Challenges. Ethiopian Journal of Environmental Studies and Management, 1(1), pp.1-12

Onatere-Ubrurhe, J. O (2016), Developing a Benchmarking Methodology for the Nigerian Transport sector. A PhD thesis submitted to the university of Wolverhampton.

Oni S.I., Okanlawon K.R. 2011. Transport planning in Nigeria: A plea for incorporating the gender factor. Journal of Social Sciences vol. 29 vol. 2, pp. 177_182.

Onimisi,T.&S.H.Osasona, (2021), Factors affecting effective policy implementation in Nigeria: focus on federal character principle.www. researchgate.net/publication/June/2021.

Oresanya, O. (2015). The Lagos megacity project: the way forward: Lagos State Publishing.

Oroleye,A.K.(2019).Appraisal Of Road Transport Policy Reform In Nigeria: A Case Of Infrastructural Deficit. Journal of Governance and Public Policy.Vol.6.N0.3.October,2019.

Oyesiku, K. (2011). ‘‘Development before town planning, the cause of flooding in Nigeria’’. Retrieved from Oyeyemi B. 2017. Sharing the Nigerian experience: Case study of the World Bank safe corridor project.SSATP Annual Meeting and Associated Experience Sharing Events. Marrakech, Morocco.

Papacostas, C. S, &Prevedours, P. D.(2012). ‘Transportation Engineering & Planning (third edition).University of Hawail.

Paulina Muratone. (2018). “Planning for Low-Carbon Urban Transport Systems”.

Road runner mobility Tech.ltd,2023.

Rode,P.,Heeckt,C.,daCruz,N.F. (2019).NationalTransportPolicyandCities:Keypolicyinterventionstodrivecompactandconnectedurban

Rodrigue,Notteboom,Slack,(2020).The Geography of Transport Systems. Fifth

Solanke.M.O (2013).Challenges of urban transportation in Nigeria.International Journal of Development and Sustainability.

SSATP (2018),Africa Transport Policy Program. Policies for Sustainable Accessibility and Mobility in Urban Areas of Nigeria.

Sumaila, A. F.(2013).Building sustainable policy framework for development: A review of national transport policy initiatives in Nigeria.International Journal of Development Sutainability/Vol,2.No.2(2013).

The Norwegian National Transport Plan 2018-2029 (viewed 1 February 2019available at:https://www.ntp.dep.no/Forside/plangrunnlag-nasjonaltransportplan-2018-2029.

Ugwuanyi,B.1&Chukwuemeka, E.O.(2013).The Obstacles of Effective Policy Implementation by the the Public Bureaucracy in Developing Nations. The case of Nigeria.Singaporean Journal of Business Economics and Management Studies.Vol.1.No.8.2013.

United Nations, Department of Economic and Social Affairs, Population Division. 2015. World Urbanization Prospects: The 2014 Revision, Highlights. New York: United Nations.

Uzoho ,M.C&Okeudo, G.N.(2021).The Effect of Fleet Maintenance Activities on the Profitability of Transport Firms in Nigeria. Emerald International Journal Of Scientific and Contemporary Studies.www.emeraldacademics.com.Vol.1.No.1.February, 2021.

William, A. A.(2016).The Impact of Transportation Infrastructure in Nigeria’s Economic Development. Walden University.

World population review.(United Nations data 2020,2021).

Yin, R. K. (2013). Case study research: Design and methods. Sage publications.

Patrick Mulyungi (2021-08- 14). "Port Harcourt-Maiduguri rail line reconstruction project flagged off". Thisday.Retrieved 2021-12-04.

Guardian, News of 3rd March,2022.

Nrc-ng.org".nrc-ng.org.Retrieved 2022-04-24.

MILITARY CHECKPOINTS IMPACT ON TRANSPORT AND LOGISTICS DEVELOPMENT IN BIU, BORNO STATE

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Abstract: *The study analysed the impact of checkpoints on transport and logistics development in Biu, Borno State Nigeria. Purposive sampling technique was adopted to select 30 respondents from motor parks within Biu. Respondents were inter-state commercial drivers who have the idea of military checkpoints along their respective routes. Primary source of data which is interview was used and collected data was analysed quantitatively using tables and percentages. Seven variables were analysed which include delay, additional costs, accessibility constraints due to presence of checkpoints, damage of goods as a result of roughly handling of soldiers at the checkpoints, reduction of investment in transport and logistics, and night journey restriction. The results showed that all the variables have negative impact on the growth transport and logistics in the study area courtesy of military checkpoints. The study therefore recommended that Federal Government of Nigeria through Nigerian Army should establish clear guidelines for checkpoints, training and retraining of military personnels on transport and logistics procedures. Army should introduce technologically based procedures as a replacement for manual passengers searching and goods vetting, establish complaint centres for transport users. Lastly, Federal Government of Nigeria should be permanently resolved insurgency issue in the state and the zone.*

Keywords: Checkpoints, Development, Military, Logistics, Transport

1. Introduction

Insecurity poses a threat to wellbeing and economic growth of troubled society. There is no society that can survive in the face of insecurity. Boko Haram insurgency has been terrorising the northeast of Nigeria for more than a decade, with Borno State serving as the centre of their operations. The sect has committed heinous crimes such as premeditated murders, suicide attacks against innocent people, extensive kidnappings, infrastructure destruction, town and village burning and looting. Numerous academics have documented the incidents of these attacks and homicides (Dauda, 2021; Abiodun et al, 2020; Brechenmacher, 2019; Bintube, 2015). Attacks by Boko Haram have not been confined to one sector. These attacks occur in almost every sector. Among the sectors affected by these attacks is transportation and logistics, particularly road.

Since the formation of Boko Haram, which has killed innocent Nigerian citizens and attacked infrastructure, road transport networks and overall systems has been the soft target of attacks which has not only caused commuters fatalities and damage

commodities, right of freedom to move among others but has also successfully impeded the flow of goods and people, having an overall negative effect on the economy of Borno State and the zone generally. In Borno State alone, terrorists have been involved for daily road attacks and mines planting, turning road travel into a death trap.

The terrorist group has heightened hostilities between passengers and transportation providers and severely disrupted the free flow of goods and services, particularly agricultural commodities. Their activities in the state have resulted in the deaths of commuters (Familusi and Oshomoh, 2018), abandonment of particular routes for transit, reduced level of activites related to road transportation, spoilage and waste, reduced inaccessibility of certain places, market volatility, disruption of the food supply chain, and degree of road transport activities, increase in transport costs (Ikpe, 2017), as well as attack on the interstate highways that enter and exit the cities (Higazi, 2015) and the interruption of services.

In the fragile state of Borno, the military has employed approach of establishing military checkpoints on major highways, which is believed to be of interest to Boko Haram, in order to contain attacks. The military monitor vehicular movements and stop and search drivers and other road users by using security checkpoints on roads as part of internal security operations. Security checkpoints are thus used to capture suspicious or wanted individuals as a proactive and reactive security measure. It helps to curb illegal activities, particularly when it comes to the movement of light and small weaponry on highways according to Musa (2018).

The use of this strategy is one of the counterterrorism tactics that has been effective in reducing Boko Haram attacks. But given how important these military checkpoints are to counterterrorism activities, its effect on transport and logistics development cannot be overlooked. Despite the fact that checkpoints have been the subject of several studies, their effects on the development of transportation and logistics in Biu, Borno State Nigeria is lacking in the literature.

The paper was organised such that part two of the paper was devoted to methodology, which covered the study location, sample size and technique, study design, and data analysis method, was logically followed. The results and discussions were reported in part three, which covered delay, additional costs, accessibility constraints due to presence of checkpoints, damage of goods as a result of roughly handling of soldiers at the checkpoints, reduction of investment in transport and logistics, and night journey restriction and their overall implication ontransport and logistics development in the study area while the conclusion and recommendations were presented in section four.

2. Methodology

This study was carried out in Biu, Borno State Nigeria. Biu is one of the largest communities in Borno State and was chosen based on the activities of Boko Haram. It is one of the populous communities in Borno State and it has direct links with other state including Adamawa, Gombe and Yobe State.

The community housed over 257,500 according to citypopulation.de (2024) and other notable Government Institution including Nigerian Army University, College of Education, Waka and Abogo Lagema Military Cantonment. The troops deployed in the town and on the roads within Biu environment for safety had several times foiled Boko Haram attempt to attack the community especially after sited University in the community and its neigbouring communities. It was reported that on January 10, 2022, suspected members of the terrorist group Boko Haram attacked Tukur Yusufu Buratai Institute for War and Peace, Nigerian Army University Biu for killing atleast two employees and burning vehicles and offices on the campus in Buratai (Scholars at Risk, 2022), a 35.5km to Biu according to www.distancesfrom.com. Also, Miringa, a community of 8.7km to Biu was attacked by Boko Haram in 2024 but was not captured in the news.

Purposive sampling technique was adopted for this study to select respondents from the selected inter-state motor parks within Biu. The parks were those ones plying Biu to Gombe city, Biu to Guyuk, Adamawa State and Biu to Damaturu, Yobe State. The inclusion criteria for the respondents were inter-state commercial drivers, being in commercial transport business for at least five years, and have the idea of military checkpoints along their respective routes. Those drivers volunteered to participate in the study since it is something that concerns their business. The major language of the respondents communication is Hausa and the information gathered was in Hausa before translated to English. Data were gathered through the primary source. Because of their level of education and the nature of their work, data was gathered through in-depth interviews with Yes/No answer before further explanations from them. These were conducted on 30 purposively selected drivers who have demonstrated mastery of the subject matter in the quantitative survey across the three main motor parks in Biu for five days and with the help of Nigerian Army students who serve as research assistants and they are from Hausa speaking States. The interviews were done face-to-face and descriptive statistics which tables and percentages were used to analyse the collected data.

3. Results and Discussions

3.1 Delay at the checkpoints

Table 3.1: Delay at the checkpoints

No	Variables	Yes	No
i	Have you ever experienced delay at the checkpoint before	100%	00%%
Ii	I experience delay at the checkpoint often	73.4%	26.6%
iii	Do you spend upto 5 to 10 minutes at each checkpoint	66.1%	33.9%
Iv	Delay affects your business and hampers work productivity	78.1%	21.9%
V	Sometimes they ask me to offload both passengers and loads carried for vetting	54.8%	45.2%

vi	It reduced frequency of delivery of certain products to the owners.	79%	21%
vii	Delay experienced at the checkpoints sometime damage goods with short life span	60.3%	39.7%

Source: Researcher's Analysis (2024)

Findings showed that all the commercial drivers in the study area have experienced delay at the checkpoints before. 73.34% of them showed that the delay at the checkpoints is often, 66.1% agreed that they spent upto 5 to 10 minute at each of the checkpoint before they could be allowed to pass, the yes answer of 78.1% showed that it affected their business and hampered their work productivity, 54.8% of them revealed that searching and vetting of passengers and loads take longer period than waiting for directive to pass. They also agreed that checkpoints reduced the frequency of delivery of certain goods and 60.3% of drivers showed that delay experienced at the checkpoints sometimes caused damage to goods carried.

From the commercial transport drivers in Table 3.1, the analysis showed their daily encounter with soldiers at the checkpoints. Although their experiences differed, they all agreed that the delays they encountered at the checkpoints hampered their business and ultimately decreased the work productivity. Respondents who drive along Biu to Gombe contended that, before reaching Gombe, they may have to pass through 4 or 5 checkpoints along the way, and that they may spend at least 5 to 10 minutes at each checkpoint only if there are no vehicles in queue.

This could take them more than 30 to 40 minutes in the event that drivers or commutters argue with soldiers. Occasionally, they purposefully delay to see their reactions. This lengthens the amount of time spent traveling for a specific journey in the study area. Biu to Gombe can sometimes be reached in 2 to 3 hour, although occasionally it might take up to 4 hour due to issues at the checkpoints. Drivers may be requested to park under a specific tree in situations where soldiers want to examine passengers or inspect goods. For instance, in Kwaya Kusa, there is constant searches and vettings of both passengers and loads. Drivers are require to offload the entire loads for vetting, unless they can show the soldiers at the checkpoints that they are not carrying any harmful loads.

Reloading takes longer than an hour, and occasionally, passengers' loads get misplaced or spoilt.
Also, it reduces frequency of delivery of certain products to the owners. Some necessary goods, like medications, maybe require quick transportation of these products to sick or distant relatives. However, delays at checkpoints can often prevent deliveries of these goods on time or even damage goods with short life span. This delay occasionally worsened the patients' illnesses, sometimes leading to complications or death. Added to this, is the questioning of other passengers and drivers, or needless attention to female passengers in an attempt to obtain information for an affair.

3.2 Additional costs

Table 3.2: Additional costs incurred by drivers at the checkpoints

No.	Variables	Yes	No
I	The presence of checkpoints have increased my costs as commercial driver	84.5%	15.5%
Ii	Goods carried dictate the amount to be paid at the checkpoints	74.6%	25.4%
iii	Sometimes soldiers at the checkpoints picked goods from my vehicle without paying	61.4%	38.6%
Iv	Sometimes I carry some of their officers without paying me	59.9%	40.1%
v	Checkpoints increase fuel consumption	91.3%	8.7%

Source: Researcher's Analysis (2024)

Table 3.2 showed the additional costs incurred at the checkpoints and its implication of the development of transport and logistics in the study area. It showed that 84.5% of the respondents agreed that the presence of checkpoints have increased their costs as commercial driver, 74.6% revealed that goods carried by them dictate the amount to be paid at the checkpoints, 61.4% revealed that sometimes soldiers picked goods from their vehicles without paying while 59.9% agreed that sometimes they carried many soldiers free of charge and 91.3% agreed that the delay experienced at the checkpoints increased their fuel consumption.

The interviewees' comments indicate that the presence of checkpoints on Borno highways has resulted in increased expenses for commercial drivers who use the identified routes and leading to a significant lack of development in the logistics and transportation sectors. These costs entail paying a bribe of N100 at each checkpoint in order to bypass delays and be granted passage. Depending on what the driver transported, this fee varies. The amount to be paid at these checkpoints will depend on the drivers' loads. For example, in Miringa**,** if driver loads food items, they pay those soldiers N500 at each checkpoint.

Occasionally, they pick goods like biscuits, snacks passengers' loads from the vehicles, and the drivers are liable for paying the owner back. Some soldiers rely on transportation assistance at checkpoints for travel. They depend on commercial drivers to carry them free of charge. This costs also includes the cost of burning fuel while waiting for instructions from the soldiers at the checkpoints and the cost of damage incurred due to delays encountered at the checkpoints. This undermines the development of transport and logistics in the identified state and north east zone in particular. Due to these costs, a large number of commercial drivers have chosen to forgo these routes in favour of others where military operations are less obvious.

3.3 Accessibility

Table 3.3: Lack of Accessibility

No	Variables	Yes	No
I	The presence of checkpoints has made some areas less accessible.	79.8%	20.2%
Ii	Checkpoints reduced my access to some market places in the area	81.6%	18.4%
iii	Certain roads has been closed down	87.1%	12.9%
Iv	Inaccessible of some rural areas through checkpoints policy has made vehicles unavailable to transport farm produces to market locations.	72.3%	27.7%
V	Some drivers have diverted their routes to other places due to their inaccessible to certain areas as a result of checkpoints	69.7%	30.3%

Source: Researcher's Analysis (2024)

Data in Table 3.3 showed inaccessibility of commercial drivers to some areas as a result of checkpoints and its implication on the growth of transport and logistics in the study area. 79.8% of them agreed that presence of checkpoints has made some areas less accessible, 81.6% revealed that it reduced their access to some market places in the area, 87.1% agreed that some roads has been closed down, 72.3% agreed that checkpoint has made vehicles unavailable to transport farm produce to market locations while 69.7% agreed that some drivers have diverted their routes to other places as a result of checkpoints..

Participants' feedback indicated that checkpoints made some areas less accessible. This restriction is attributed to security reason and reduced their access to market thereby affecting their economic activities. The access restriction affects business especially those ones at the rural areas. Certain roads may closed indefinitely, and in certain situations, commercial drivers need military directive before traveling that particular routes. This process may take longer than a week and soldiers at the checkpoints are used to ensure that drivers follow the directive. Example of this is Biu-Damaturu road. The majority of agricultural products in crisis-prone areas spoilt because there aren't available vehicles to transport them to market locations.

Delivering goods to rural dwellers for business purpose become problematic for the drivers. Meanwhile, the findings of this study showed that drivers earn more on transporting goods or farm produces than moving passengers but erection of checkpoints make it impossible to access their farmers customers. Most drivers have been forced to alter their routes to destinations outside of Borno State as a result of this circumstance. This has resulted in ineffective supply chain management, restricted access to services like health and education, longer travel times, decreased mobility, and a decline in societal sustainability, all of which have an impact on the growth of the transportation system in the identified study area.

3.4 Damage of Goods

Table 3.4: Damage of goods

No	Variables	Yes	No
I	The way soldiers at the checkpoints handled passengers' loads contributed to the damages of those goods	69.9%	30.1%
iii	Uncare handling of passengers' goods at the checkpoints sometimes caused additional cost to me and has implication on my reputation and business	81.3%	18.7%
Iv	It affected customers' satisfaction levels	74.2%	25.8%

Source: Researcher's Analysis (2024)

Data in Table 3.4 showed the impact of checkpoints on damage of goods and its implication on the growth of transport and logistics in the study area. 69.9% agreed that the way soldiers at the checkpoints handled passengers loads contributed to the its damage such as medications, 81.3% agreed that roughly handling of passengers' goods at the checkpoints caused additional cost and affect their reputation while 74.2% agreed that it affect customers' satisfaction levels.

The participants have demonstrated that the manner in which troops handled passengers' belongings at checkpoints contributed to the destruction of certain items, and that the coarse examination of products resulted in harm to necessities like medications and this in turn had caused additional cost on drivers. Damages include cracking merchandise cartoons and exposing certain goods to unrequired temperature. This behaviour at the checkpoints has affected the reputation of the drivers, costing the transport operators additional costs, driving away business, and compromising supply chain management effectiveness. It has also impacted customer satisfaction levels, which in turn has impacted the growth of transportation and logistics in the study area.

3.5 Reduction of investment in transport and logistics

Table 4.5: Reduction of investment in transport and logistics

No	Variables	Yes	No
I	The presence of checkpoints makes it difficult for me to predict the future of this my profession.	87.6%	12.4%
Ii	The presence of checkpoints scared me to invest on this my job.	76%	24%
Iii	The present multiple checkpoints had made many of my colleagues to invest in other business aside from transport and logistics.	76.3%	23.7%

Source: Researcher's Analysis (2024)

Data in Table 3.5 showed the impact of checkpoints on damage of goods and its implication on the growth of transport and logistics in the study area. 87.6% agreed that presence of checkpoints makes it difficult for me to predict the future of this my profession, 76% agreed that the presence of checkpoints among other factors scared them to invest much in their businesses while 76.3% agreed that checkpoints has made their colleagues to leave transport business for other businesses.

They affirmed that the frequency stops and searches occasioned by soldiers at the checkpoints created uncertainty and difficult for them to predict the future of the profession. Majority of them

argued that the presence situation in the identified study area did not allow them to investment on their job due to the checkpoints situation in the zone generally. The present of multiple checkpoints scary those of their colleagues that are rich from investing in road transportation. Some of them have diverted the fund to other businesses rather than investing where they will not get returns. Multiple checkpoints are indication of instability and investing huge resources in such environment is not visible and impacted farm produces supply chain management.

3.6 Restriction of Night Journey

Table 3.6: Restriction of Night journey

No	Variables	Yes	No
I	Checkpoints are used as tool for night movement restriction	94.6%	5.4%
Ii	Use of checkpoint to control night journey movement reduced driver's working hours, caused delay and lowered productivity	85.1%	14.9%
iii	Use of checkpoint to control night journey movement isolated some areas from been accessible during the night	87.5%	12.5%
Iv	Use of checkpoint to control night journey movement diminished the efficiency of overall logistics and transportation	90.4%	9.6%

Source: Researcher's Analysis (2024)

Data in Table 3.6 showed the impact of checkpoints on damage of goods and its implication on the growth of transport and logistics in the study area. 94.6% agreed that checkpoints restricted them from night journey, 85.1% agreed that it reduced their working hours and lowered their productivity, 87.5% agreed that it disallowed them to access some areas during the night while 90.4% agreed that it diminished the efficiency of overall logistics and transportation

From the data gathered, it was revealed that restriction of night movement significantly has impacted transport and logistics development in the study area. In the identified area, night movement restriction starts by 8pm in the evening and ends by 6am in the morning. Although, it is part of security measure to safe the area from attacks but the policy has impacted drivers' working hours, caused delays in the delivery of essential commodities such as relief supplies such as relief materials, leading to economic losses by incurred additional costs on the drivers, isolate the identified area to only be accessible during the day, lowering drivers' productivity, transportation timetables and diminishing the efficiency of overall logistics and transportation.

IV Conclusion and Recommendations

Based on the data collected, the study concluded that military checkpoints negatively affected the majority of commercial drivers in the study area and had an overall negative influence on the development of transportation and logistics in the area. This has resulted in a delay in the deliveries of goods or products, increased costs for drivers in the form of fuel, bribes, and extortion, as well as a cost of damages incurred on drivers as a result of handling of

goods by soldiers during a checkpoint's screening process. Other factors include inaccessibility to some locations within the state, items damaged by rough handling, or problems with offloading and reloading at a specific checkpoint, which may adversely affect drivers' reputation and cost them additional costs. Checkpoints have also reduced investors from investing in transport and logistics in the study area due to multiple erection of checkpoints which denotes instability. Lastly, the closing of communities' borders in the study area by 8pm in the evening and opening by 6am in the morning by soldiers at the checkpoints in the study area has impacted overall transport and logistics efficiency thereby impacting the development of the sector in the study area.

In light of the findings of the study, the following recommendations are made:

i. Federal Government of Nigeria through Nigerian Army should establish clear guidelines for checkpoints, training and retraining of military personnel on transport and logistics procedures. This will increase their professionalism, expertise, and understanding when dealing with commercial drivers, particularly in crisis prone areas like Biu and North east zone of Nigeria.
ii. Introduction of technologically based procedures by Army as a replacement for manual passengers searching and goods vetting, such as surveillance systems. This will lower the amount of commodities.
iii. Boost cooperation between the public and commercial sectors.
iv. Nigerian Army should establish complaint centres for transport users. This will help Army in their decision-making.
v. Lastly, Federal Government of Nigeria should be permanently resolved insurgency issue in the state and zone. This will deter strong regulations like those limiting nighttime travel, encourage investment in transport and infrastructure development, and bring growth to the road transport and logistics in the zone.

References

Abiodun, T. F., Omolayo, O. O., Tomisin, A. D., & Chinedu, O. C. (2020). Assessment of boko haram insurgents' threats to educational development in the northeast Nigeria: The way forward. *African Journal of Social Sciences and Humanities Research*, *3*(1), 31-43.

Brechenmacher, S. (2019). *Stabilizing northeast Nigeria after Boko haram* (Vol. 3). Washington, DC: Carnegie endowment for international peace.

Bintube, M. (2015). Boko Haram phenomenon: genesis and development in north eastern region Nigeria. *International Journal of Sociology and Anthropology Research*, *1*(1), 1-22.

Dauda, R. S. (2021). Conflict and development in North-east, Nigeria: The case

of Boko haram insurgency. *Mondopoli Journal 2 (2)*.

Familusi, O. O., & Oshomoh, T. O. (2018). Socio-economic implications of Boko haram insurgency in northern Nigeria. *KIU Journal of Social Sciences*, *4*(2), 213-223.

https://www.distancesfrom.com/ng/directions-from-Biu-Rd-to-625HH25-Buni-621002-via- Buratai-603109/DirectionHistory/46207809.aspx#:~:text=Directions%20from%20Biu%20Rd%20to%20625H+H25%20via%20Buratai%20603109.%20Direction

Higazi, A. (2015). Mobilisation into and against Boko Haram in North-East Nigeria. In *Collective Mobilisations in Africa/Mobilisations collectives en Afrique* (pp. 305-358). Brill.

Ikpe, E. (2017). Counting the development costs of the conflict in North-Eastern Nigeria: the economic impact of the Boko Haram-led insurgency. *Conflict, Security & Development*, *17*(5), 381-409.

Musa, S. Y. (2018). Hawking at Highway Security Checkpoints in Northern Nigeria: A Critical Analysis. Jos journal of social issues Vol.11, 47-60

Scholars at Risk (2022). 2022-01-10 Nigerian Army University Biu | Scholars at Risk

REGIONAL TRANSPORT INTEGRATION: CROSS-BORDER LINKS

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Abstract: *Regional Transport Integration (RTI) plays a crucial role in enhancing economic development, trade facilitation, and social cohesion across neighboring countries. In West Africa, however, intra-regional trade remains low despite geographical proximity and shared historical and cultural ties. This is largely due to fragmented transport networks, inefficient border processes, regulatory inconsistencies, and high logistics costs, all of which hinder seamless connectivity across the sub-region. This paper adopts a conceptual review approach, analyzing existing literature, case studies, and regional policy frameworks to identify the key barriers to effective regional transport integration in West Africa. It also draws lessons from successful regional transport integration initiatives in Europe and Southeast Asia, offering insights into adaptable strategies for the West African context. The findings highlight that poor infrastructure, lack of harmonized policies, security concerns, and cumbersome border procedures are major impediments to cross-border trade and transport. Additionally, weak coordination among member states and limited investment in cross-border infrastructure projects continue to slow progress towards deeper regional integration. To address these challenges, the paper recommends strengthening regional cooperation within ECOWAS, harmonizing transport and customs regulations, investing in multi-modal transport infrastructure, and promoting public-private partnerships to finance key projects. Enhanced border management, digital trade facilitation tools, and a coordinated regional transport master plan are also proposed to improve cross-border mobility, foster economic integration, and support the development of regional value chains. This paper underscores that effective regional transport integration is essential for unlocking West Africa's economic potential, strengthening its competitiveness in global trade, and fostering deeper social and cultural ties among its people.*

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1. Introduction

Regional Transport Integration (RTI) creates cross-border links, an essential impetus stimulating national and regional economic growth and development. The RTI concept has gained prominence in politics and interdisciplinary academic discourse, straddling management, geography, sociology, international relations, and political and international economy (Meddeiros 2015). A **Cross-Border Link** is a territorial unit comprising various adjoining units between two or more countries; it is a more or less institutionalized collaboration between contiguous sub-national authorities across national borders. Cross-border regions share connections, history, and cultural elements because of globalization. Irrespective of their size, level of organization, development, and financial capacity, these regions are emerging to cope with social and economic problems by attracting investments, large-scale infrastructure projects, and exchanges for political stability

(Nave & Franco, 2021). Now, more than ever, countries are working together across borders. This promotes economic and social growth and unity in cross-border areas and regions. Regional transport integration and strengthening cross-border links are critical components in facilitating economic growth and regional development and enhancing the overall competitiveness of regions. Effective regional transport integration reduces barriers to trade, logistics, and mobility and promotes social and cultural ties between countries.

Regional transport integration is a topical issue worldwide. This is because development in the aftermath of global financial crises requires that engines of growth be rebalanced in favor of regional resources. However, in Africa, the inability to exploit the potential of regional economic integration and value chains seriously limits the growth prospects of sub-regions. In West Africa, for example, while the potential of intra-regional trade remains substantial, the costs of trading prevent regional economic integration and value chain redistribution. This is problematic, especially because these costs are often higher than trading with distant regions like the EU and North America, effectively denying countries the benefits of geographical proximity and contiguity to intra-regional trade. Logistics cost of trade within West African countries is about $1,000 - $2,500 per container (depending on distance) while with a long distance of EU, North America and far Asia ranges from $1,500 - $4,500 per container, below is the typical inter and intra cross border trade in West Africa.

Region	**Tariffs**	**Logistics Costs (Shipping)**	**Other Costs (Regulations, Delays, etc**
Intra-West Africa	5-15% (Some NTBs remain)	$1,000 - $2,500 per container (depending on distance)	10-20% added costs due to delays, checkpoints, and Bribes
Africa to Europe	Mostly duty-free under EPAs for many products	$1,500 - $3,500 per container	Compliance with EU regulations (e.g., SPS) adds significant costs
Africa to U.S. (under AGOA)	Duty-free for many products, 5-20% for others	$2,500 - $5,000 per container	Stringent U.S. standards for compliance and testing

International Trade Centre -Trade in West Africa, 2022

Poor surface transport networks and mutual trade border facilitation in the sub-region exacerbate this challenge.

An interdisciplinary approach is needed to solve the challenges; however, this presentation will focus on transportation, specifically, the intersection of transportation and regional transport integration. The presentation will explore key aspects of regional transport integration, its significance and challenges, and case studies from different regions to highlight gaps and opportunities for effective regional transport

integration in the West African region. Additionally, the presentation will offer policy recommendations to enhance cross-border transport connectivity.

2.0 Aim

2.1 This study is aim to create a better understanding of Regional Transport Integration (RTI) in facilitating economic growth, trade, and regional cooperation.

3.0 Objectives:

a. Understand the concepts and benefits of regional transport integration.
b. Analyze successful case studies and best practices.
c. Identify challenges and obstacles to integration.
d. Recommend strategies for overcoming integration challenges.

4.0 Conceptual Clarifications

a. Regional : This refers to a geographic area that is smaller than a country or continent, but larger than a city or local community. It encompasses a group of neighboring countries, states, provinces, or territories that share common characteristics, cultural ties, economic interests, or historical bonds.The e focus however is on a group of countries within a region.

b. Transport: This also known as transportation refers to the movement of people, goods, and services from one place to another using various modes, infrastructure, and systems.

c. Integration: This is the process of combining multiple components, systems, or entities to form a unified whole, promoting coordination, cooperation, and interdependence.

d. Regional Transport Integration (RTI): This is the process of connecting and coordinating transportation systems, infrastructure, and services across regional boundaries to enhance economic, social, and cultural exchanges between neighboring countries.

e. **Cross Boarder Links:** These refer to connections, relationships, or interactions between individuals, organizations, or entities across international borders, facilitating the exchange of goods, services, ideas, and culture.

5.0. Key Aspects and Significance of RTIs.

5.1 Economic Growth and Trade Facilitation

Regional Transport integration reduces logistics costs and transit times, key elements for improving trade competitiveness. By harmonizing transport policies, regions can eliminate bottlenecks that impede trade and increase the flow of goods. **Intra-EU Trade** has grown consistently, with trade between EU member states reaching approximately **€3.1 trillion in 2022**, according to Eurostat. The Single Market, which promotes the free movement of goods, services, people, and

capital, accounts for around **69%** of the total goods trade of EU member states. Cross-border road freight transport increased by 8% between 2010 and 2020, driven by the expansion of pan-European transport corridors like the Trans-European Transport Network (TEN-T).The European Union (EU) provides a prominent example of how transport integration facilitates regional economic growth. The Trans-European Transport Network (TEN-T) provides seamless connections between EU member states, contributing to a more competitive single market (European Commission, 2021).

Achieving effective RTI in West Africa, with Nigeria as a central player, could significantly boost trade volumes, reduce transport costs, and enhance regional value chains. For example, reducing trade barriers and improving transport infrastructure could increase **intra-African trade by up to 52%** by 2022, according to the AfDB.

5.2 Social and Cultural Integration

Improved cross-border transport links enhance the movement of people, facilitating cross-border education, tourism, and labor migration, among other benefits. This movement fosters a greater sense of regional identity and collaboration. In Southeast Asia, the ASEAN Economic Community (AEC) has promoted cross-border travel through improved transport corridors, thereby strengthening cultural and social ties (ASEAN Secretariat, 2015). **Increased Cross-Border Mobility:** According to a 2022 report by the European Commission, the number of people traveling within the EU for work, tourism, or study has steadily increased since the implementation of the **Schengen Agreement** and the development of the **Trans-European Transport Network (TEN-T)**. For example, in 2021, **over 390 million people** crossed European borders by rail, road, or air for leisure and work-related purposes- **EU Passenger Transport Growth:** The **European Union Transport Scoreboard (2020)** reported that passenger transport, especially cross-border road and rail travel, grew by **6.5% annually** over the last decade. This has significantly enhanced European identity, reduce of regional disparities and strengthened solidarity

As in other regions, better transport links could foster greater social and cultural ties between West African countries. Improved road and rail connectivity would allow for more cultural exchange, labor mobility, and educational opportunities across borders.

5.3 Job Creation and Poverty Reduction: Better transport connectivity would create jobs, not just in infrastructure development but also in logistics, tourism, and manufacturing, contributing to poverty reduction across the region.

6.0 Case study

6.1 The European Union: Trans-European Transport Network (TEN-T)

The EU has developed one of the world's most comprehensive regional transport networks through the TEN-T program. This initiative seeks to connect all EU member states through an integrated system of roads, railways, ports, and airports. The network reduces travel time, promotes trade, and improves the overall competitiveness of the EU's economy. Additionally, the program places a strong emphasis on sustainability, with significant investments in green and digital transport infrastructure (European Commission, 2021).

6.2 ASEAN: The ASEAN Highway Network and Singapore-Kunming Rail Link

In Southeast Asia, the ASEAN Highway Network (AHN) and the Singapore-Kunming Rail Link (SKRL) are key projects aimed at improving regional connectivity. These projects help bridge the infrastructure gaps between ASEAN member states and create smoother transport corridors for goods and people. The AHN, in particular, is vital in facilitating trade and tourism between ASEAN countries (ASEAN Secretariat, 2015).

6.3 Africa: The Programme for Infrastructure Development in Africa (PIDA)

Africa has launched the Programme for Infrastructure Development in Africa (PIDA). The initiative aims to address the continent's infrastructure deficits and enhance regional transport integration. The PIDA aims to build high-quality roads, railways, and ports, focusing on major transport corridors such as the Trans-African Highway network. PIDA also promotes

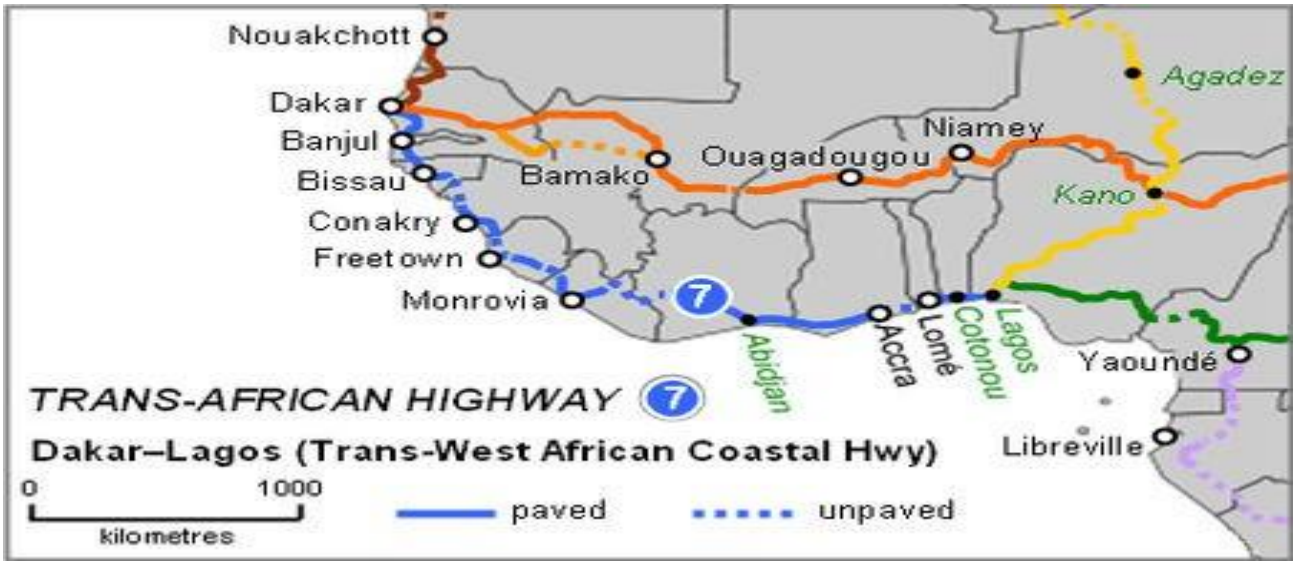
6.4.1 Economic Growth and Trade Facilitation

harmonizing transport regulations and standards to facilitate cross-border movement (AfDB, 2019).

6.4 Regional Transport Integration in West Africa

West Africa, a region comprising 15 countries under the Economic Community of West African States (ECOWAS), with Mali, Niger and Burkina Faso still included because of the ongoing integrated programmes, has long recognized the importance of regional transport integration as a key driver of economic growth, trade facilitation, and socio-cultural connectivity. However, despite numerous policy frameworks and projects aimed at improving cross-border infrastructure, the region continues to face challenges in creating seamless transport networks. This paper explores the current state of regional transport integration in West Africa, its significance for economic and social development, the key challenges, and ongoing efforts to improve cross-border transport links.

Intra-regional trade in West Africa remains low compared to other regions of the world, with ECOWAS accounting for only about



15% of total trade among its member states (ECOWAS, 2020). Poor transport infrastructure, lengthy border processes, and high transportation costs are among the main obstacles. Regional transport integration can significantly enhance trade within the region by improving road, rail, and maritime connectivity. For instance, efficient transport links between coastal and landlocked countries, such as Burkina Faso, Mali, and Niger, are critical for accessing markets and reducing the costs associated with imports and exports.

6.4.2 Free Movement of People and Goods

The ECOWAS Free Movement Protocol, adopted in 1979, aims to ensure the free movement of people, goods, and services across member states, a goal that is heavily dependent on integrated transport systems. The improvement of regional transport links facilitates migration for labor, education, and tourism purposes, further strengthening the region's social and cultural ties. Improved transport infrastructure also supports access to essential services like healthcare and education for populations in remote areas.

6.4.3 Regional Competitiveness

Improving transport infrastructure across borders can help West Africa become more competitive in the global economy. By creating efficient trade routes, particularly along the coast and into the interior, the region can reduce the costs of exporting goods and improve access to international markets. Moreover, reducing transport costs and improving efficiency would enhance the region's attractiveness to foreign investors looking to tap into the regional market.

7.0 Current State of Transport Integration in West Africa

7.1 Road Networks

West Africa's road network remains the most widely used mode of transport for intra-regional trade, with more than 90% of trade being conducted via roads. ECOWAS has developed several regional road corridors under its Transport Facilitation Program to connect major economic centers across the region. Key corridors include the Trans-West African Coastal Highway, which stretches from Dakar (Senegal) to Lagos (Nigeria), covering 4,560 kilometers. Despite these efforts, many of the roads remain in poor condition, with maintenance and funding challenges causing frequent disruptions.

7.2 Rail Infrastructure

Rail transport in West Africa is underdeveloped, with limited cross-border connections. Most rail systems are isolated within individual countries and are often in need of modernization. ECOWAS has identified rail transport as a priority for regional integration, with plans to link major cities across the region through the West African Railway Master Plan. However, financing and political will remain significant barriers to realizing this ambitious goal.

7.3 Maritime and Port Infrastructure

West Africa's coastal countries are home to several major ports, including those in Abidjan (Côte d'Ivoire), Lagos (Nigeria), and Tema (Ghana), which serve as important gateways for both regional and international trade. Improving port infrastructure and enhancing the connectivity between ports and inland transport routes is critical to boosting intra-regional trade. The Abidjan-Lagos Corridor, a flagship project under the ECOWAS Infrastructure Master Plan, aims

to improve both maritime and road connectivity along the coast.

8.0 **Transport Integration in Nigeria**

Nigeria, being the largest economy and most populous country in Africa, plays a crucial role in regional transport integration efforts in West Africa. Achieving regional transport integration (RTI) in West Africa involves developing interconnected transport infrastructure across countries, harmonizing policies, and promoting easier movement of goods, services, and people. Nigeria's central position in the Economic Community of West African States (ECOWAS) makes its contribution to RTI highly significant. However, the country faces several challenges while also making notable progress. Here's an overview of Nigeria's situation in achieving RTI in West Africa:

8.1 Nigeria's Role in ECOWAS and Regional Initiatives:

Nigeria is a key member of ECOWAS, which aims to promote economic integration and development, including transportation infrastructure. ECOWAS has identified regional transport as a priority, with projects such as the Trans-West African Coastal Highway, the West African Power Pool, and regional railway initiatives designed to boost trade and movement between West African countries. Nigeria has committed to ECOWAS protocols, which promote the free movement of people and goods, but implementation remains uneven due to border control issues and security challenges.

8.2 **Nigeria's Infrastructure Development:**

Nigeria's road and rail infrastructure are critical for regional connectivity. The country has invested in several key projects to enhance transportation within and across borders. These include:

- The Lagos-Abidjan Corridor, part of the Trans-West African Coastal Highway project, is a major regional route that connects Nigeria with Benin, Togo, Ghana, and Côte d'Ivoire. This corridor is vital for trade and the movement of people, but road quality and maintenance remain challenges.
- Nigeria is also improving its railway network to link with neighboring countries. The Lagos-Kano Standard Gauge Railway is part of a broader initiative to connect Nigeria's northern regions with Niger and beyond. However, delays and funding challenges have hindered rapid progress.

8.3 Some other key Cross-border Efforts

6.3.1 Port and Maritime Connectivity:

Nigeria's ports, particularly the Lagos Port, play a significant role in regional trade. Lagos is a major entry point for goods into West Africa, but congestion, poor infrastructure, and inefficient customs procedures have long been barriers to smoother regional integration.

The ongoing development of the Lekki Deep Sea Port is expected to relieve pressure on Lagos and enhance Nigeria's position as a regional trade hub, facilitating smoother import and export operations for both Nigeria and neighboring countries.

8.3.2 Air Transport Integration:

Nigeria's air transport sector also plays a key role in regional integration. Murtala Muhammed International Airport in Lagos is one of the busiest in West Africa, serving as a key hub for air traffic between West African nations. Efforts to enhance regional air connectivity include Nigeria's participation in the Single African Air Transport Market (SAATM), which seeks to liberalize the African aviation market, increase competition, and reduce air travel costs across the continent. However, full implementation has been slow.

8.3.3 Trans-West African Railway Projects:

Nigeria is actively involved in efforts to develop regional rail connectivity. The Trans-West African Railway Project, which is intended to link West African countries from Dakar (Senegal) to Lagos (Nigeria), remains in the planning stages, with financial, technical, and logistical challenges delaying its realization.

Nigeria's internal rail expansion projects, like the Lagos-Ibadan and Abuja-Kaduna rail lines, are seen as stepping stones toward creating a fully integrated regional rail network.

8.3.4. Impact on Trade and Regional Growth:

Nigeria's integration with regional transport systems is critical for trade within ECOWAS, as the country accounts for nearly 70% of West Africa's GDP. However, despite its economic size, intra-regional trade in West Africa is only about 15% of total trade, according to the African Development Bank (AfDB), compared to much higher rates in other regions (e.g., 58% in the EU). The lack of seamless transport infrastructure is a key factor in this low level of regional trade. Nigeria's exports to neighboring countries have been affected by transport inefficiencies, with informal cross-border trade often being larger than formal trade due to bureaucratic hurdles.

9.0 Challenges of RTIs

9.1 Infrastructure Gaps and Financing Issues

One of the major challenges of RTIs is the disparity in transport infrastructure development across countries within a region. Some countries may have advanced transport networks, while others lag behind due to insufficient investment or lack of financing options. In Africa, for instance, countries face significant infrastructure gaps that hinder regional trade. The African Development Bank (AfDB) has identified infrastructure financing as a key challenge in achieving transport integration across the continent (AfDB, 2019).

9.2 Regulatory and Institutional Barriers

Harmonizing transport regulations, standards, and policies across borders is another challenge. Different countries may have varying standards for road safety, rail systems, and aviation, which complicates efforts to streamline cross-border transport. In Latin America, despite progress in developing integrated transport networks, regulatory inconsistencies between countries pose obstacles to seamless transport integration (Inter-American Development Bank, 2017).

9.3 Geopolitical Tensions and Border Conflicts

Geopolitical tensions and territorial disputes can significantly impede the progress of

transport integration. For instance, despite efforts to improve cross-border transport links in South Asia, tensions between countries such as India and Pakistan limit the full realization of transport connectivity (ESCAP, 2018).

9.4 Security concerns and border delays

Despite the ECOWAS Free Movement Protocol, cumbersome border and customs procedures continue to pose significant barriers to regional trade. Traders often face long delays at borders due to inconsistent application of customs regulations, corruption, and inadequate infrastructure at border posts. The lack of harmonized customs procedures across member states is a major impediment to creating seamless cross-border transport networks.

9.5 Political and Institutional Barriers

Political instability in certain West African countries poses a challenge to transport integration efforts. For example, conflicts in Mali and Burkina Faso have disrupted transport corridors and delayed the implementation of key infrastructure projects. Additionally, differences in national priorities and a lack of coordinated regional planning have slowed progress on transport integration initiatives.

9.6 Inadequate funding and investment:

Inadequate funding and investment hinder the development and maintenance of regional transportation infrastructure, constraining economic growth and integration. Insufficient government allocations, high borrowing costs, and limited private sector investment result in delayed or abandoned projects, inadequate maintenance, and reduced capacity expansion. This funding gap affects infrastructure development, maintenance, and operations, leading to increased transportation costs, reduced connectivity, and decreased regional competitiveness. Consequently, regional trade and economic growth are stifled, undermining the potential benefits of Regional Transport Integration. Addressing this challenge requires innovative funding solutions, public-private partnerships, and increased government commitment to transportation infrastructure development.

10.0. Policy Recommendations for Strengthening Cross-Border Links

10.1 Investment in Infrastructure

Regional organizations and governments, especially in Africa, should prioritize investments in transport infrastructure to close existing gaps. Public-private partnerships (PPPs) can be leveraged to secure financing for large-scale projects. Multilateral development banks such as the World Bank and the African Development Bank can be key in funding regional transport projects. Nigeria needs to strengthen partnerships with the private sector to fund large infrastructure projects, as government resources alone are insufficient to meet the country's transport needs. Leveraging **AfDB** and other international funding opportunities could help accelerate progress.

10.2 Regulatory Harmonization

To address regulatory and institutional barriers, countries within a region should work toward harmonizing transport policies, safety standards, and customs procedures. Regional organizations such as ASEAN, the African Union (AU), and the European Union (EU) can provide platforms for cooperation on these issues. Nigeria must

work closely with ECOWAS to ensure better policy alignment, particularly around customs procedures, tariffs, and security protocols to enable smoother cross-border transport and trade.

10.3 Strengthening Regional Cooperation and Diplomacy

Countries should engage in diplomatic efforts to resolve geopolitical tensions that hinder transport integration. Regional organizations and international mediators can facilitate dialogue between countries with border disputes or geopolitical issues that affect transport corridors.

10.4 Emphasis on Sustainability

As regions expand their transport networks, sustainability should be a central consideration. Governments should focus on green infrastructure projects that reduce carbon emissions, promote electric mobility, and prioritize public transport over private vehicles. Enhancing security at borders and along transport corridors is essential for Nigeria to fully participate in regional transport integration without frequent border closures

10.5 Improve border management and customs procedures

Modernizing border infrastructure, implementing efficient clearance processes, and harmonizing customs regulations will reduce transit times, costs, and bureaucratic hurdles. Key initiatives include introducing one-stop border posts, automated customs systems, and risk-based inspection procedures. Additionally, simplifying documentation, enhancing transparency, and promoting mutual recognition of compliance standards facilitate trade facilitation. By improving border management and customs procedures, countries can increase trade volumes, reduce congestion, and enhance security, ultimately fostering economic growth, regional integration, and cooperation, while minimizing delays and costs associated with cross-border transactions.

10.6 Promote private sector investment and participation

Promoting private sector investment and participation is another strategic approach to strengthening cross-border links, leveraging private expertise and resources to develop and operate regional transportation infrastructure. This involves creating conducive business environments, offering incentives, and implementing public-private partnerships (PPPs) to attract investment in transportation networks, logistics, and border facilities. Private sector involvement brings efficiency, innovation, and financial resources, enhancing the quality, capacity, and reliability of cross-border transportation services. By encouraging private sector participation, governments can unlock new funding sources, share risks, and tap into expertise, ultimately driving regional economic growth, job creation, and integration, while increasing competitiveness and improving the overall business climate.

11.0 Conclusion

Regional transport integration is essential for promoting economic growth, enhancing trade, and fostering social and cultural ties between neighboring countries. While challenges such as infrastructure deficits, regulatory barriers, and geopolitical tensions exist, effective policy interventions can significantly enhance regional connectivity.

The EU, ASEAN, and Africa case studies demonstrate the importance of a coordinated, multi-stakeholder approach to transport integration. As the global economy becomes increasingly interconnected, further efforts to strengthen cross-border links will play a critical role in driving sustainable development and regional cooperation. Nigeria is crucial to the success of regional transport integration in West Africa, given its economic weight and strategic location. While Nigeria has made strides in developing infrastructure and participating in regional initiatives, significant challenges remain. These include infrastructure deficits, security concerns, and inefficient customs processes. To fully unlock the benefits of RTI, Nigeria must continue to invest in its transport systems, strengthen regional cooperation, and address cross-border trade barriers. Achieving this will enhance not only economic integration but also social and cultural ties across West Africa.

References

- African Development Bank (AfDB). (2019). *Financing Infrastructure for Sustainable Development in Africa*. AfDB.
- ASEAN Secretariat. (2015). *Master Plan on ASEAN Connectivity 2025*. ASEAN.
- European Commission. (2021). *Trans-European Transport Network (TEN-T)*. European Commission.
- Inter-American Development Bank. (2017). *Regional Infrastructure Integration in Latin America*. IDB.
- United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). (2018). *South Asia Subregional Economic Cooperation (SASEC) Program Report*. UNESCAP.
- SSATP (2024): Changing the story of Regional Integration of Africa
- World Bank (2001): Regional Transport Integration

STRATEGIES FOR CLIMATE RESILIENT AND TRANSFORMATION OF TRANSPORTATION INFRASTRUCTURE IN THE NIGERIAN CASE[1].

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Abstract: *The increasing frequency of extreme weather events caused by climate change poses serious risks to Nigeria's transportation infrastructure, threatening economic growth, mobility, and environmental sustainability. Despite this, Nigeria's transport policies and infrastructure planning largely neglect climate resilience, leaving critical transport assets vulnerable to flooding, erosion, and rising temperatures. This paper examines strategies for transforming Nigeria's transportation infrastructure into a climate-resilient system capable of withstanding future climate impacts. The study adopts a qualitative research approach, relying on secondary data from government reports, climate studies, and transport sector analyses, with thematic analysis applied to identify vulnerabilities, best practices, and actionable strategies for Nigeria. Findings reveal that most Nigerian transport infrastructure lacks climate-adaptive design, contributing to frequent service disruptions, infrastructure degradation, and escalating maintenance costs. International case studies demonstrate that climate resilience strategies, such as green infrastructure, climate-adaptive materials, and integrated land-use planning, can reduce vulnerability and enhance long-term sustainability. The paper recommends mainstreaming climate resilience into Nigeria's national transport policies, increasing investments in resilient infrastructure technologies, and fostering public-private partnerships to drive innovation and financing for sustainable transport solutions.*

Keywords: Climate Resilience, Transportation Infrastructure, Climate Change Adaptation, Sustainable Transport, Nigeria

INTRODUCTION

Economic growth, industrial development and urbanization are unstoppable phenomena. Our contemporary world is rapidly developing and population of people living in cities and urban centres has risen steadily over the years. For instance, since 2010 the urban population that was about 53% will rise to 60% by 2030 and rapidly to 66% by 2050. In terms of absolute figures, between 2010 and 2050, 2,5 billion to 3billion people will be added to the urban population worldwide. The population increase is accompanied by steady economic growth and development as cities contribute 80% to global GDP, 70% of global energy consumption and equally 70% carbon emission (Oyesiku, 2024b). Associated with these trends are increasing

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motorization and dynamic transportation and logistics systems development.

Global development and related socio-economic growth are equally accompanied by the climate change phenomenon. Global temperature has been on the increase in recent decades, a trend that has significantly contributed to increase in the number of disasters related to extreme weather. For instance, in 50years, 1970 and 2019, the number of weather-related disasters has increased five-fold of a magnitude of more than 11,000 disaster of the likes of deadly storms and flooding, heat waves, extreme rainfall droughts and so forth (see Figures 1 and 2).

Figure 1: Flooding in Cities affecting normal living activities is becoming a recurrent phenomenon.

Figure 2: Flooding in Cities affecting normal living activities is becoming a recurrent phenomenon.

Within the said period over two (2) million people died as a result of the disasters resulting in associated economic losses amounting to $3,64 billion as summarised in Figures 3 1 and 4. What is more troubling and of relevance to this paper is the concern of World Habitat, ascertaining that, more than 90% of these huge number of deaths related to extreme weather disasters have occurred in developing countries. Rather unfortunately, these are the same set of countries with little or no investment in comprehensive disaster risk-management and complete absence of climate change adaptation strategies well integrated in the national and local disaster risk-reduction strategies. It is against these observed trends in the global socio-economic development and climate change that this paper is important towards sustainable development of the nations and constituents' states.

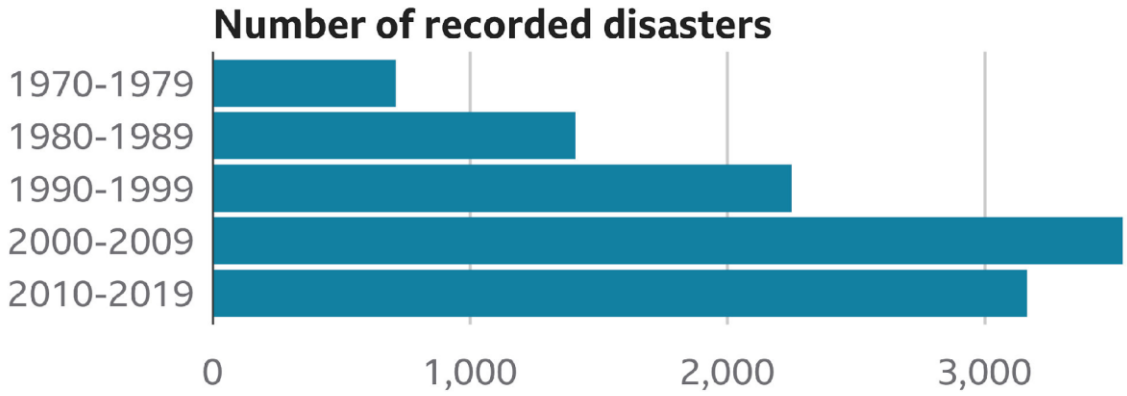

Figure 3: Distribution of Disasters by Decades in 50 years.
Source: United Nations World Meteorological Organization 2021 Report.

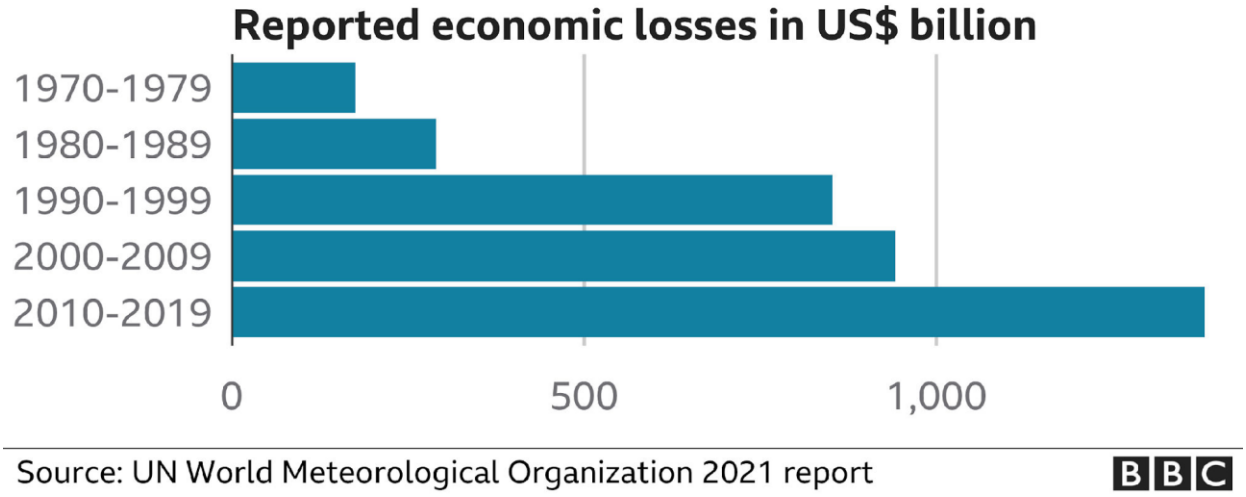

Figure 4: Distribution of Disasters by Decades in 50 years.
Source: United Nations World Meteorological Organization 2021 Report.

During the last two centuries, the world has experienced an accelerating expansion of socio-economic and the human development population. The population was around 1 billion in 1800, doubled by around 1930, and increased to 6.1 billion by 2000. These developments have had many environmental consequences, among which has been an increase in the quantities of the greenhouse gases carbon dioxide, methane (CH_4) and nitrous oxide (N_2O), being emitted to the atmosphere from land-use activities. The environmental deterioration, arising from the need for transportation and logistics development has reached alarming levels and has raised concerns about global warming and climate change. As a result, understanding of the reasons for greenhouse gases emission and its relationship with transportation infrastructure development and other land-use has become increasingly important in recent years.

CLIMATE AND CLIMATE CHANGE: CONCEPTUAL ISSUES

Climate has been described as the average weather conditions of a place or region over a period. It includes all conditions such as winter, spring, summer, harmattan, rainfall, and entails special events like tornadoes, floods and droughts. Stemmed on this premise, climate change is viewed as a prolonged change in the weather conditions of the globe as one entity (Satterwaite, 2007, cited in Oyesiku, 2010). Climate change is a notable element that shape and re-shape various activities of human beings. It is imperative to note that, the extent of is impact is determined by existing or prevailing social, economic, ecological, institutional, technological and processes of governance in the society. It however goes beyond doubt that climate change can exacerbate inequalities, and vulnerability to it varies and complex. For several decades, the impacts of climatic change on livelihoods have been a disturbing issue for governments in developed and developing world. Over the course of the past half-century, the world in which most people lived in rural areas has been transformed into a predominantly urban world. This trend has influenced not just the physical location of population but also the organization and conduct of economic and social life of most people on the planet-both urban and rural dwellers (Pacione, 2001, cited in Oyesiku, 22010**)**. The rapid growth of the world's population has been accompanied in most countries by the multiplication and growth of urban places. The United Nations estimates that between 1950 and 2025 the number of urban dwellers would have increased nearly by seven-fold, from 738 million to 5.1 billion (Oyesiku, 2010). The effects of urbanization and climate change are converging in dangerous ways that seriously threaten the world's environmental, economic and social stability (UN-Habitat 2011). Climate change is unequivocally taking place and some of the poorest people in the world are already suffering from its effects. Higher global surface temperatures and sea level rises are contributing to increasing frequency and intensity of extreme weather events, with disastrous effects on individuals and governments in developing countries. It has been projected that despite of the effort to lessen greenhouse gas emissions, climate change will continue to take place over the next century. This will even exacerbate existing environmental problems in many counties, mostly in the least developed countries which do not have the capacity to shield their cities. There is a global inequality between those cities who are causing climate change and those who are at high risk from its effects. These cities under high risk, which hardly contributes to the overall greenhouse gas emissions, still must undertake adaptive measures. These countries are mostly the developing countries which have an enormous backlog in the

basic infrastructure services to protect their cities (Haque, Grafakos and Huijsman, 2010)

The argument that increasing emissions of carbon dioxide from transport-related activities accelerate climate change scenarios seems tenable according to the United Nations Intergovernmental Panel on Climate Change (IPCC) models (IPCC, 2007). The assessment report revealed that 50percent of the observed increase in global temperature during the last five decades can be attributed to anthropogenic greenhouse emissions part of which transport play a key role (IPCC, 2007, 2019). The transport system has mutual interactions and multidimensional effects on environment (i.e. in terms of urban air pollution, climate change and land use), economic development (i.e. in terms of GDP) and social equity (i.e. in terms of accessibility, human health, life quality of cities and metropolitan areas). Amongst the industries, transport is the sector with the fastest growth of greenhouse gases emissions, both in developed and in developing countries. In developed countries this problem is intensified with substantial growth in transport volumes.

It is consequent upon the role of transport in global carbon monoxide (CO), various hydrocarbons (HC), oxides of nitrogen and particulate lead (MCPB) emissions that opinion has been unanimous on the need for the development of non-motorised transport as a way of reducing global CO2 emissions (Hickman, Saxena, Banister and Ashiru, 2012; Hull, 2010; Kenworthy, 2008 see Guneralp et al 2017). For instance, in the South Korean government developed a 'low carbon green growth' as a national vision, thus promoting the use of bicycle as a mitigating factor against traffic congestion and carbon emission (KMOCT, 2001 cited in Odufuwa et al, 2012). This is in view of Korean's 1.2% bicycling population compared to 14% and 21% of Japan and Netherlands respectively. Accordingly, the plan was aimed at expanding bicycle lanes from 9,170km to 17,600km in 2012. Okon, (2014) reported that in the Netherlands, there are more bicycles that residents, noting that that up to 70% of intra-urban commuters' journeys in Amsterdam and Hague are undertaken by bicycles (BBC News Magazine, 2013 cited in Oyesiku, 2024b). Based on such parameters as daily cycling levels, bike sales, safety, cycle tourism and advocacy activity', the European Cyclists' Federation Barometer identified ten (10) most bike-friendly countries in Europe. These include Denmark, Netherlands, Sweden, Finland, Germany, Belgium, Austria, Slovakia and United Kingdom (ECF, 2013 cited in Okon, 2014).

Literature affirmed that since personal transportation is a significant contributor to environmental problems, there is an ongoing effort at political level to strive for a more sustainable development, that is, a "development that meets the present needs without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, cited in Oyesiku, 2021). Even though the concept of sustainability has been criticized for being vague and ambiguous (Lélé, 1991 cited in Oyesiku, 2010), it is commonly used in policy documents as well as in the public debate. Moreover, there are several definitions of sustainability in relation to transportation (Janic, 2006; VTPI, 2008 cited in USEPA, 2014). Issues that should be addressed when striving for a sustainable transport are, for example, economic aspects, such as, affordability, resource efficiency, employment, and productivity; social aspects, such as, equity, human health, and quality of life, and environmental issues, such as, pollution prevention, biodiversity, precautionary actions, and aesthetics (VTPI, 2008).

Sustainable transportation is touched upon in various political documents at global, regional, and national levels. They vary in the extent to which they specify measurable targets as well as when and how the goals should be achieved. One agreement at a global level with important implications for the transportation sector is the Kyoto protocol from 1997. In this agreement, the participating countries decided to reduce greenhouse gas emissions by at least 5 % from the emission level in 1990 until 2008-2012 (UN, 1997 cited in Oyesiku, 2010). At the European level, the European Commission has developed a Common Transport Policy. In 1992, the European Commission proposed the first White Paper, and the most recent White Paper appeared in the year 2001 suggesting 60 different measures to be implemented at the community level by 2010 (EU, 2001 cited in Croci, et al, 2019). A mid-term review was performed in 2006 stressing the need for a wide variety of policy tools to achieve a shift to more environmentally friendly transport modes as well as a striving for optimizing each transport mode (i.e., more environmentally friendly, more energy efficient, and safer) (EU, 2006). In Sweden, the overall goals for an ecologically sustainable development are expressed in 16 environmental objectives (e.g., reduced climate impact, clean air, and natural acidification only).

Orindi (2009) noted that, historically the earth has experienced periods of cooling and warming, with mean temperatures remaining relatively stable. It was further ascertained that, these changes were due to the energy balance between land, sea and atmosphere. Meanwhile, human activities such as burning fossil fuels and deforestation have contributed to the increase in greenhouse gases (GHG) in the atmosphere. These trap much of the heat that would otherwise escape from the earth, leading to a generally warmer world. This according to Orindi (2009) will have serious impacts on: (i) increase in average temperatures estimated to be between 1.8 and 4.0^0 C by 2100. (ii) snow melt in the polar regions, resulting in sea level rise that may displace populations and destroy the infrastructure in low lying coastal areas. (iii) changes in rainfall amounts and distribution, leading to an increased frequency and intensity of extreme climatic events, such as floods and drought; (iv) dry areas are expected to get drier.

Similarly, the impacts of climate change are predicted to affect the livelihoods of Africans in many ways:

(i) By 2020, between 75 and 250 million people are predicted to be exposed to increased water stress due to climate change.

(ii) By 2020, yields from rain-fed agriculture in some countries could be reduced by up to 50%, increasing food insecurity and hunger.

(iii) By 2080, an increase of 5 to 8 percent of arid and semi-arid land in Africa is projected.

(iv) Climate change is likely to affect the distribution patterns of infectious diseases.

(v) Sea levels are projected to rise by around 25cm by 2050; Africa's coastal areas are already experiencing environmental problems including coastal erosion, flooding and subsidence (Hounkponou and O'Neil, 2014).

Transportation system is the foundation of development of any city or country especially developing countries. It should be noted that, the issue of development cannot be discussed devoid of the sustainability in terms of physical (environment), social and economic. Sustainability of every development is necessary for long term benefit of that infrastructure or plan; therefore, transport and sustainability has been studied in context of each other towards having a

long-term development and environmental protection. The contributing effect of transportation and economic growth and development is not in doubt. The effect of increasing level of motorization and the consequent need for the expansion of transport infrastructure is becoming overwhelming. The importance of the transportation dynamics along with economic growth and development of the cities is the draw back on the effect of the former, that is, transportation and infrastructural growth on sustainable growth and the development not only of the cities buy also the regions and the world at large. One of the consequences of the rapid growth in transportation is the greenhouse gases emissions, which is becoming unavoidable in most developing countries including Nigeria. Transport is responsible for 22% of global energy-related carbon dioxide (CO2) emissions (OECD, 2012), which are projected to increase by 35% until 2035 under a New Policies Scenario (OECD 2012). At the same time the transport sector is playing an important role in economic and social development (UNESCAP, 2011), as it provides accessibility to services and facilities that society considers vital. However, conventional transport pathways and policies also contribute to local, national, regional and global problems, such as air pollution, climate-related impacts on transport infrastructure and services, transport-related social exclusion, road safety and congestion. Bakker; Zuidgeest; Coninck, and Huizenga (2014) posit that transport and infrastructure development enables economic and social development but is often detrimental to sustainable development due to congestion, accidents, air pollution, as well as greenhouse gas emissions. It was further advanced that various policy frameworks have been created to connect transport with development, development with climate change and climate change mitigation with the transport sector.

To promote the overall sustainable development of transport systems, including the reduction of greenhouse gas (GHG) emissions from the transport sector, different types of policy instruments have been developed, tested and implemented. These range from land use, transport and infrastructure planning instruments to economic, regulatory and behavioural instruments focussing on fuel pricing, driving behaviour and vehicle technology (Banister, 2008; Grazi and Van den Bergh, 2008). Although the benefits of such actions are widely recognized (OECD 2012), to date the policies have had only limited success. This is testified by fast-rising GHG emission trends in virtually all countries and worsening congestion and air quality in most cities, but especially in the developing world (IPCC, 2007; Zusman et al., 2012). However, so far, no consistent framework exists that addresses these three areas in an integrated manner. Generally, the following observations are worthy of note as highlighted by Sperling and Salon (2000 cited in Oyesiku, 2010):

i. Rapid motorization and rapid growth in transportation related greenhouse gas emissions are prevalent in most developing countries because few people have access to public transportation, and therefore, higher level per capital of transportation emission.
ii. There is no correlation between car ownership and income as the growths in vehicle ownership have cut across all income groups while it is correct to say that income is the primary force of motorization, slight increase in the income level of the people in the cities first target personal provision of mobility of any type, the type of mobility which is usually below standards of the level of minimal tolerance of emission level. Thus, all kinds of

mobility are on the road as long as it takes the owner from one place to another.

iii. There are limited alternative transportation modes available to the people and therefore once they have personal vehicle transition to alternative transportation mode is often difficult.

iv. The policies and strategies that can slow the growth of rapid traffic congestion are either not in place or not effectively enforced. The fact that kills strategies of slowing draws the growth of transportation such as the provision of choices of alternative transportation mode, for example, public transportation by rail, tram, and ferry are usually not well incorporated into the transportation plan. The absence of many sensible polices and strategies has contributed to increasing use of private cars and increasing greenhouse gas emission.

v. Many cities have not embraced innovative and effective strategies for slowing and reducing greenhouse gas emission from transportation at local and national levels.

Literature revealed that transport sector appears to adopt innovations such as multi-modal integration, ICT, behaviour-oriented demand management, battery electric vehicles and socio-spatial innovations such as complete streets are generally not (yet) strong enough to challenge the internal combustion-based motorization paradigm and its socio-technical system, which is stable with only a few cracks due to developments such as awareness on climate change, rising oil prices, the rise of the 'information society' (Geels, 2012 cited Dariani, 2019), health and congestion concerns, which can be considered landscape developments. In some urban environments in the developed world, car ownership especially among younger people is dropping as public transport, walking and cycling become feasible alternatives (Kuhnimhof et al., 2013). Bakerr, et al (2014) posit that views differ on what changes in the transport sector are required to achieve sustainable development, including long-term climate targets. Some scholars and influential organizations have predominantly focused on changes in vehicle efficiency, engine technology and alternative fuels in their emission scenarios, a vision sometimes referred to as the 'technology-fix' (IEA, 2012). Others argue that new mobility concepts, demand management and behavioural change are required for sustainable development including sharp GHG reduction in the transport sector (Anable, Brand, Tran, & Eyre, 2012; Banister, Anderton, Bonilla, Givoni, Schwanen, 2011; McCollum & Yang, 2009). This would, however, imply that multiple elements of the socio-technical regime need to change simultaneously.

Berrittella et al (2008) explained that development of intelligent transport systems (ITS) and information technologies are now emerging as a set of key tools for improvement in the management of the transportation network. These must be considered in the context of travel demand management, because the new and emerging technologies allow to improve the modal split of travel. There are several possible ways to affect peoples' choices as to which mode of travel to select in space and in time, in broad terms. These are the following: (i) reduce the reliance or attractiveness of private transport through measure, such as private vehicle access control; (ii) increase the attractiveness of more environmental and sustainable forms of transport (such as public transport, carpooling); (iii) use of new telematics means to reduce the reliance on travel to congested business areas and city centres by trip substitution in the form of teleworking/telecommuting.

SOURCES OF GREENHOUSE GASES EMISSION

Almost all GHG emissions come from the consumption of material goods and energy and the production of waste, which depend on living standards and behaviours. As cities concentrate population, high living standards, and economic activities, they are responsible for consuming large amounts of goods, services, and, indirectly, energy. To assess – and thereby reduce – the overall greenhouse gas emissions from these cities, it is necessary to identify the main sources of these emissions. Variations in the proportion of greenhouse gas emissions that can be attributed to different sectors reflect the economic base of different cities (whether this is primarily industrial or service oriented), the urban morphology (the density and distribution of settlement) and the level of wealth (with, for example, its influence on private car ownership rates).

From year to year, emissions can rise and fall due to changes in the economy, the price of fuel, and other factors. Human activities are responsible for almost all the increase in greenhouse gases in the atmosphere over the last 150 years.

The primary sources of greenhouse gas emissions are:

- **Transportation –** The Transportation sector includes the movement of people and goods by cars, trucks, trains, ships, airplanes, and other vehicles. Most greenhouse gas emissions from transportation are carbon dioxide (CO_2) emissions resulting from the combustion of petroleum-based products, like gasoline, in internal combustion engines. The largest sources of transportation-related greenhouse gas emissions include passenger cars, medium- and heavy-duty trucks, and light-duty trucks, including sport utility vehicles, pickup trucks, and minivans. The remaining greenhouse gas emissions from the transportation sector come from other modes of transportation, including commercial aircraft, ships, boats, and trains, as well as pipelines and lubricants.
- **Electricity production –** The Electricity sector involves the generation, transmission, and distribution of electricity. Carbon dioxide (CO_2) makes up most greenhouse gas emissions from the sector, but smaller amounts of methane (CH_4) and nitrous oxide (N_2O) are also emitted. These gases are released during the combustion of fossil fuels, such as coal, oil, and natural gas, to produce electricity.
- **Industry –** The Industry sector produces the goods and raw materials use every day. Greenhouse gas emissions from industry primarily come from burning fossil fuels for energy, as well as greenhouse gas emissions from certain chemical reactions necessary to produce goods from raw materials. Differences in environmental legislation have also transformed the geography of industrial location. "…when [cities] are able, they will get rid of polluting industries, pushing them away from city centres to suburbs or to other cities" (Oyesiku, 2021) These patterns can be seen in the large variations in the proportion of a city's greenhouse gas emissions that can be attributed to the industrial sector, particularly between China and the rest of the world. As Walker and King describe the situation: "Many of the countries in the western world have dodged their own carbon dioxide emissions by exporting their manufacturing to other countries. Next

time you buy something with 'Made in China' stamped on it, ask yourself who was responsible for the emissions that created it" (see Oyesiku, 2021),

- **Commercial and Residential –** Greenhouse gas emissions from businesses and homes arise primarily from fossil fuels burned for heat, the use of certain products that contain greenhouse gases, and the handling of waste.
- **Agriculture, Forestry, and Other Land Use-** GHG emissions and removals in the agriculture, forestry, and other land use (AFOLU) categories are typically small, often negligible, for most urban regions. These emissions become significant only if the regional boundary is large, including substantial rural area in addition to the urban core, or where agricultural activities are particularly intense. Greenhouse gas emissions from agriculture come from livestock such as cows, agricultural soils, and rice production.
- **Waste generation-** At a global level, the Intergovernmental Panel on Climate Change (IPCC) records waste and wastewater as being responsible for 3 per cent of greenhouse gas emissions. However, this figure varies widely between cities: These variations are likely to be due not only to different patterns of consumption and waste generation but also to differences in the management of waste and differences in accounting mechanisms.

CONTEMPORARY TRANSPORT POLICY ISSUES IN RELATION TO CLIMATE CHANGE

Transportation infrastructure development causes both local and large-scale environmental problems. In urban areas, emissions of particulate matter (PM), nitrogen dioxide (NO_2), volatile organic compound (VOC), and carbon monoxide (CO) are particularly important from a health perspective, while emissions of nitrogen oxides (NO_x) and sulphur dioxide (SO_2) contribute to the acidification of buildings (Van Wee, 2007 cited in Oyesiku, 2021). Large scale environmental problems caused by traffic include climate change because of carbon dioxide (CO_2) emissions, acidification of nature, agriculture, and the landscape, as well as large scale air pollution (Van Wee, 2007). One of the greatest challenges of transportation development in Nigerian cities is the incessant traffic congestion. The congestion is not only occurring in virtually every part of the city, but also almost throughout the day. The consequences of this are persistent greenhouse gas emissions that affect not only the environment but also the people.

There are several policies and strategies in place to address these challenges as well as making provisions for choices of alternative transportation modes. With respect to road traffic administration ,recent regulations provide for the following:

i. Prohibits or restricts the use of some specified highways by vehicles of specified class and description.

There is prohibition of vehicles parking or waiting on specified highways.

ii. Restriction of trailers, petrol tankers and long vehicles from conveying passengers and such categories of vehicles shall not enter or travel within the metropolis between the hours of 6am and 9pm.

iii. Restriction of certain vehicles exceeding certain breath or height from making use of certain bridges, in addition all vehicles may not exceed a specified speed limit when crossing the bridge.

iv. Removal of abandoned vehicles from highways and site of private premises by police officers or member of the taskforce is now mandatory.
v. Suitable parks and facilities are to be provided by the state for safe custody of removed vehicles.
vi. Instant arrest of careless and inconsiderate driving persons and payment of heavy fines of such person convicted similar heavy fines are also included for any person who drives a motor vehicle on the highway recklessly or negligently or at a speed above the stipulated limit or in the manner which is dangerous to the public.
vii. The bus rapid transit lanes are adequately protected as any person who drives or causes his vehicle to be driven along the lane or parks a vehicle within 15 meters nearer to intersection or drives his vehicle on unauthorized route is guilty of punishable offense.

The overall goal of these provisions of road traffic administration is for effective and efficient flow of traffic. More importantly, they are to assist in reducing congestion which is a primary contributing factor to the increasing greenhouse gas emissions. Therefore, the motorist compliance with the substance of these regulation will on the long run minimize congestion and consequently reduce the emission.

The other aspects of transportation plans of some cities are the introduction of alternative transportation modes particularly through the following: establishment of BRT and the huge success of large number of private owners making use of the service; encouragement and support of rapid development and use of ferries along the internal water ways in the city; and the development of light rail public transport system, that is at advance stage.

Transportation related greenhouse gas emission is growing faster than emissions from all other sectors. It is therefore important to advance strategies to slow the growth in greenhouse gas emissions, through restrain vehicle demand and use, employ new technologies, particularly those currently available in the developed counties, and develop internal technology that can expedite the use of fuel cells, smart transit services, and other cutting-edge technologies. These cutting-edge technologies as leapfrog technologies. They are so called because such technologies have skipped over those available in the developed world and have considerable merit. Such technologies include ITS technology used to control road congestion and for the collection of tolls. Fuel sell vehicle are known to be more energy efficient and less polluting. The summary of strategies and policies to reduce pollution and show greenhouse gas emission is as shown in Table 3.

Table 3: Illustrative Strategies and Policies to Reduce Pollution and GHG Emissions.

	Regulation	Market-based Instruments	Direct Investment
Vehicle Efficiency	Performance standards such as the U.S. CAFE standards	Feebate system, fuel tax, accelerated vehicle scrappage program, "gas-guzzler" tax	Investment in R&D to improve vehicle design for efficiency

Fuel Choice	Mandates such as the decision requiring all Delhi buses to run on compressed natural gas	Subsidies for alternative fuel vehicles: fuel tax differentials for alternative fuels	Investment in R&D and marketing of alternative fuel vehicles
Mode Choice	Bans on private vehicle use in the city centres	Subsidies for transit riders; roadway tolls and parking fees in areas that are accessible by transit	Investments to increase and improve the quality of transit service, such as car sharing and other private car alternatives
Travel Activity	Mixed-use zoning, no-drive day	Market incentives for high density development	Investment in optimizing logistics for goods delivery
Vehicle Occupancy	Laws prescribing the number of passengers per vehicle entering city centres	Incentives for carpooling such as HOV lanes	Investment in intermodal freight transportation centres; investment in more comfortable public transit vehicle.

STRATEGIES FOR CLIMATE RESILIENT AND TRANSPORTATION INFRASTRUCTURE TRANSFORMATION

Transforming transportation infrastructure to be climate-resilient is dire for developing countries. This more so that transportation infrastructure in these countries is vulnerable to climate change impacts, comprising extreme weather events and gradual changes in temperature and precipitation patterns. From the ongoing, climate change poses significant risks to transportation infrastructure, threatening economic growth, social development, and environmental sustainability through: Extreme Weather Events (rising Temperatures and increased heat stress on infrastructure, vehicles, and passengers; floods, landslides, and storms damage infrastructure, disrupt operations, and impact safety); Sea-Level Rise (coastal erosion, flooding, and saltwater intrusion affect coastal roads, ports, and airports); Changes in Precipitation Patterns (altered rainfall and snowfall patterns impact road maintenance, drainage, and avalanche risks); and Increased Frequency of Natural Disasters (that is more frequent and intense disasters like hurricanes, wildfires, and earthquakes damage infrastructure and disrupt transportation services). The implications of these adverse effects are infrastructure damage and degradation, disrupted transportation services and supply chains, increased maintenance and repair costs and overall negative economic and social impacts (The summary of the challenges and opportunities of transportation and climate change mitigation scenario by different modes of transportation, even to the extent of urban infrastructure are well discussed in Okeudo (2024) and need not be repeated here.

It is therefore imperative to adopt the strategies to reduce risks, enhance economic growth, and promote sustainable development. Climate

resilience in relation to transportation refers to the ability of transportation systems to withstand, adapt to, and recover from climate-related disruptions. Strategies for enhancing climate resilience include: adaptive planning involving the incorporation of climate projections into transportation planning and design, flexible infrastructure with limited redundancy; infrastructure design, that is the green infrastructure - design and construction of building infrastructure that can withstand extreme weather events and changing climate conditions; material selection involving the use of climate-resilient materials and technologies that are durable and low-maintenance materials that can resist climate-related stresses; ecosystem-based adaptation, that is building natural barriers and restoration of decaying infrastructure as well as preserving and restoring natural ecosystems that provide climate-related benefits, for example, flood protection, coastal stabilization; and inclusive environmental planning and community engagement that involves educating the communities in climate resilience efforts and planning. These strategies must be accompanied by clear policy and regulatory frameworks backed by international cooperation and supported by reasonable funding mechanisms. The involvement of private sector participation in form of public-private partnerships and innovative financing models is inescapable for the success of transportation strategies.

By enhancing climate resilience, transportation and logistics reformation through these strategies can reduce the risks associated with climate change, ensure continued economic and social development, and contribute to a more sustainable transportation system. Furthermore, these adoptions will be of benefit to the citizens through reduced disruptions and service cancellations, minimized infrastructure damage and maintenance costs, enhanced passenger safety and comfort, improved freight reliability and efficiency, and reduced greenhouse gas emissions through efficient operations.

CONCLUSIONS

There have been certain general strategic options suggested as response to the urban greenhouse emission. These include Land-use zoning policies (urban master plans and land-use zoning policies); Transportation regulations rather policies ; Natural resources and environmental management; General Building guidelines; Waste policies; and Water policies. These strategic options are perfunctory rather that actively implemented and utilized, despite noticeable growth in socio-economic activities and increasing demand for mobility and transportation infrastructure (Oyesiku, 2021; 2024a). With socio-economic growth and urbanization on the rise and nearly 70 per cent of the global population projected to reside in cities by 2050, the development of critical infrastructure, affordable housing, efficient transport systems and essential social services is imperative to create resilient and sustainable cities that meet the needs of all. The transport sector is a significant and growing contributor to GHG gas emissions. Transport activity is responsible for 23% of world CO2 emissions from fossil fuel combustion. The urban transportation sector presents key opportunities for governments to reduce GHG emissions and adapt to expected climate change impacts. Key transportation policies to reduce GHG emissions or adapt to climate change impacts must ensure that the governments deploy policy tools by regulatory mandate, funding or incentives by discouraging personal vehicle use and increasing mass transit use, while land-use policies to increase proximity to urban amenities and a mixture of commercial and residential land uses can improve accessibility. There must be in place measures to discourage personal vehicle use include restrictions on personal vehicle use in designated zones or during

certain times of day, increased parking fees or reduced parking spaces, and reduced speed limits in certain zones. These restrictions are most likely to be applied in central business districts. Restrictive policies should target zones that strongly attract employees or consumers and therefore can compete with areas that are more easily accessible by personal vehicles. Policies to discourage personal vehicles should be combined with policies to increase mass transit service, quality and multi-modal linkages to maximise both policies 'effectiveness. Government at various levels can use their authority over the design and management of a city's road system to increase the share of non-motorised means of travel, particularly biking and walking.

References

Anable, J., Brand, C., Tran, M., and Eyre, N. (2012). Modelling transport energy demand: A socio-technical approach. *Energy Policy*, 41, 125–138.

Bakker, S; Zuidgeest, M.; Coninck, H. D. and Huizenga, C. (2014). Transport, Development and Climate Change Mitigation: Towards an Integrated Approach. Transport Reviews, Vol. 34, No. 3, 335–355.

Banister, D. (2008). The sustainable mobility paradigm. *Transport Policy*, 15, 73–80.

Banister, D., Anderton, K., Bonilla, D., Givoni, M., & Schwanen, T. (2011). Transportation and the Environment. *Annual Review of Environment and Resources,* 36, 247–270.

Berrittella, M; Certa, A; Enea, M and Zito, P. (2008). Transport policy and climate change: How to decide when experts disagree. *Environmental Science and Policy* 11; 307 – 31 4.

Croci, E., Melandri, S., & Molteni, T. (2019). CITIES AND CLIMATE CHANGE: Responding to an Urgent Agenda. Urban Development Series: Comparing Mitigation Policies in Five Large Cities: London, New
York City, Milan, Mexico City, and Bangkok.

Dariani, A.G, & Yazdi, S.K. (2019). CO_2 Emissions, Urbanisation and Economic Growth: Evidence from Asian Countries. Journal of the Environment, Pp 510-530.

Grazi, F. and van den Bergh, J. (2008). Spatial organization, transport, and climate change: Comparing instruments of spatial planning and policy. *Ecological Economics,* 67, 630–639.

Güneralp B, Lwasa S, Masundire H, Parnell S, Seto KC (2017) Urbanization in Africa: challenges and opportunities for conservation. Environ Res Lett 13:015002

Haque, A; Grafakos, S and Huijsman, M (2010). Assessment of adaptation measures against flooding in the city of Dhaka, Bangladesh. Institute for Housing and Urban Development Studies, Rotterdam; Working Paper 25.

Hounkponou, S and O'Neil, M. (2014). What causes climate change? *Jotoafrica: Adapting to climate change in Africa. Issue 1; 2-3.*

IEA. (2012). CO2 Emissions from Fuel Combustion. Paris; IEA

IPCC (2019). IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial

Ecosystems: Summary for Policymakers Approved Draft

.

IPCC. (2007). Climate change 2007: Mitigation. In B. Metz, O. R. Davidson, P. R. Bosch, R. Dave, L. A. Meyer (Eds.), Contribution of working group III to the fourth assessment report of the Intergovernmental Panel on Climate Change (p. 852). Cambridge University Press, Cambridge United Kingdom and New York, NY, USA.

Janic, M. (2006). Sustainable transport in the European Union: A review of the past research and future ideas. *Transport Reviews*, 26, 81-104.

Kuhnimhof, T., Zumkeller, D. and Chlond, B. (2013). Who made peak car, and how? A breakdown of trends over four decades in four countries. *Transport Reviews,* 33(3), 325–342.

Lélé, S. (1991). Sustainable development: A critical review. *World Development, 19*, 607-621.

McCollum, D. and Yang, C. (2009). Achieving deep reductions in US transport greenhouse gas emissions: Scenario analysis and policy implications. *Energy Policy*, 37, 5580–5596.

Odufuwa, B.O; Odufuwa, B. A. and Fasina, S. O. (2012). Climate Change and Livelihood: The Two Sides of a Coin. *Indonesian Journal of Geography,* IJG 44(1): 53-66.

OECD. (2012). World energy outlook 2012. Paris.

Okeudo, G. (2024). The Role of the Transportation Sector in Climate Change Mitigation. Paper presented at the Webinar organized by the Chartered Institute of Logistics and Transport, Nigeria with the theme: Laying the Foundation for a Transformed Nigerian Transportation and Logistics Sector, held 12th September 2024.

Okon, I. (2014). Evaluation of Bicycle Infrastructure in Bogota, Colombia. An M.Sc. Thesis submitted to the Faculty of Geo-Information Science and Earth Observation of the University of Twente.

Orindi, V. (2014). Climate change and the threat to African food security. *Jotoafrica: Adapting to climate change in Africa. Issue 1; 1.*

Oyesiku, O. K. (2010) New Cities in Urban and Regional Development Planning. Lagos: Longman.

Oyesiku, O. K., (2021) Transport and Logistics in Nigeria. Ibadan: HEBN Publishers.

Oyesiku, O. K. (2024a): Pioneering by Grace: An Autobiography. Austin: Pan-African University Press.

Oyesiku, O. K. (2024b): From Spatial Analysis to Sustainable Mobility Planning: Pioneering the Advancement of University Development in Globa Arena. Ago-Iwoye: Olabisi Onabanjo University House.

UN HABITAT (n. d.). The Economics of Urban Form: A Literature Review. UN HABITAT (2009). Executive Summary of Structure Plans for Awka, Onitsha and Nnewi and environs 2009-2027.

UNESCAP. (2011). Transport and the millennium development goals. Note by the Secretariat, E/ESCAP/ MCT.2/9. Retrieved from http://e.unescap.org/ttdw/MCT2011/MCT/MCT2-9E.pdf

United Nations (2014) World Urbanization Prospects: The 2014 Revision, Department for Economic and Social Affairs. New York: United Nation

United Nations Human Settlements Programme (UN-Habitat), 2011. *Cities and Climate Change: Global Report on Human Settlements.* Earthscan, London.

United Nations. 2001. World Population Prospects. The 2000 Revision. New York: UN Population. Div.

USEPA (2014). Greenhouse Gas Emissions: How Cities Can Save Trillions, Curb Climate Change, and Improve Public Health. World Resources Institute.

Zusman, E., Srinivasan, A., and Dhakal, S. (2012). Low carbon transport in Asia: Strategies for optimizing co-benefits. Routledge.

THE ECONOMIC IMPACT OF PUBLIC TRANSPORTATION ON URBAN DEVELOPMENT: A CASE STUDY OF EMERGING CITIES

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Abstract: *Urbanization is a global trend, with emerging cities in developing nations experiencing rapid population growth and infrastructure challenges. Public transportation systems are critical components of urban planning that can significantly impact economic development, social inclusion, and environmental sustainability. This article examines the economic impact of public transportation on urban development in emerging cities, focusing on the benefits and challenges posed by public transport infrastructure investments. Using a case study approach, it explores the relationships between public transport, job creation, real estate values, and overall urban growth. The paper also provides policy recommendations for improving public transportation to foster inclusive urban development.*

Keywords: Public transportation, urban development, economic growth, emerging cities, infrastructure, urbanization

1. Introduction

1.1 Background to the study

Urbanization is one of the most significant megatrends of the 21st century, with over 55% of the world's population living in urban areas as of 2018, projected to rise to 68% by 2050 (UN DESA, 2018). Emerging cities, particularly in developing countries, are facing increasing pressure to manage rapid population growth, with limited infrastructure and public services. Among these challenges, public transportation plays a pivotal role in determining the economic trajectory and social inclusivity of urban spaces.

Public transportation serves as the backbone of urban economies, enabling the efficient movement of people and goods. The construction and operation of public transport infrastructure can drive economic growth by creating jobs, stimulating real estate markets, and facilitating greater access to employment, education, and healthcare. However, these benefits come with challenges such as high initial investment costs, inadequate management, and insufficient integration with other sectors of the urban economy (Litman, 2019).

This paper aims to assess the economic impact of public transportation on urban development in emerging cities. It examines how the development of transportation infrastructure affects employment, income levels, real estate values, and the overall economy of urban areas. Through a case study analysis of selected emerging cities, the paper highlights the importance of public transportation in promoting sustainable and inclusive urban development.

2. Literature Review

The relationship between public transportation and economic development has been widely discussed in the academic literature. Transport infrastructure investment is considered a major driver of economic activity due to its effects on reducing transport costs, increasing labor mobility, and improving access to services (Banister & Berechman, 2001). Economic theory suggests that investments in transportation infrastructure can lead to positive externalities by creating agglomeration economies, where firms and workers benefit from being located near one another (Graham, 2007).

2.1 Public Transportation and Employment

Public transportation systems are often labor-intensive, requiring a workforce for operations, maintenance, and infrastructure development. The employment effects of public transport can be direct, through the creation of jobs related to the transport system, or indirect, by improving access to jobs and enabling greater labor force participation (Pereira et al., 2017). The multiplier effect of these investments can significantly increase employment opportunities in the local economy, especially in emerging cities where formal employment is scarce.

2.2 Public Transportation and Real Estate Development

Transportation networks play a crucial role in shaping land use patterns and influencing real estate values. Properties located near public transport nodes such as train stations and bus stops tend to experience higher demand, leading to increased land values and real estate development (Cervero & Duncan, 2002). This phenomenon is known as "transit-oriented development" (TOD), where public transport accessibility encourages mixed-use, high-density development in urban areas.

2.3 Public Transportation and Income Distribution

Public transportation systems can also help reduce income inequality by providing affordable mobility options for low-income populations. Efficient public transport allows individuals in marginalized communities to access better employment opportunities, education, and healthcare, thereby promoting social mobility and reducing poverty (Glaeser et al., 2008). However, the cost of public transport services and the geographic distribution of transport infrastructure can either mitigate or exacerbate inequalities depending on how they are managed (Sanchez, 2008).

2.4 Challenges of Public Transport Development in Emerging Cities

Developing public transportation systems in emerging cities presents unique challenges, including inadequate funding, poor planning, and lack of coordination between transportation and land use policies (Sohail et al., 2006). Additionally, the informal transport sector, which dominates many emerging cities, competes with formal public transport systems and often lacks regulation,

leading to safety and efficiency concerns (Cervero & Golub, 2007).

3. Research Methodology

This study employs a case study approach to assess the economic impact of public transportation on urban development in emerging cities. The case studies focus on cities in developing countries that have invested in public transport infrastructure over the past two decades. Data was collected through a combination of secondary sources, including government reports, academic publications, and transportation authorities' databases. Economic indicators such as employment growth, real estate prices, and income levels were analyzed to determine the relationship between public transportation investments and urban development.

4. Analysis and Findings

4.1 Economic Impact of Public Transportation: Case Study of Lagos, Nigeria

Lagos, the largest city in Nigeria and one of the fastest-growing urban areas in Africa, has made significant strides in developing its public transport system. The Lagos Bus Rapid Transit (BRT) system, launched in 2008, was designed to alleviate the severe traffic congestion in the city and improve mobility for its residents.

According to a World Bank report (2019), the BRT system has reduced travel times by 30% and decreased transport costs for commuters by 20%. These savings translate into increased productivity and disposable income for Lagos residents. Moreover, the construction of the BRT system created over 5,000 direct jobs, with additional employment opportunities generated in the informal sector, such as street vendors and small businesses operating around the BRT stations.

The real estate market in Lagos has also benefited from the introduction of the BRT. Property values along the BRT corridor have appreciated by an average of 15% since the system's inception (World Bank, 2019). The increased demand for properties near BRT stations has stimulated further urban development, with mixed-use buildings and commercial centers springing up in proximity to the transport hubs.

4.2 Employment Generation and Income Growth

Public transportation has had a significant impact on employment in cities that have invested in infrastructure projects. In Bogotá, Colombia, the TransMilenio BRT system created thousands of jobs during its construction phase and continues to employ a substantial workforce for its operation and maintenance. According to a study by Hidalgo and Graftieaux (2008), the system has directly generated over 40,000 jobs since its launch, with indirect employment opportunities created in related sectors such as retail and real estate.

In addition to direct employment, public transportation improves access to employment opportunities by reducing travel times and increasing mobility. A study by Ahmed et al. (2019) found that access to public transport increased labor force participation by 12% in cities with well-functioning transit systems. This increase in

mobility allows workers to access a broader range of job opportunities, contributing to higher income levels and poverty reduction.

4.3 Real Estate Development and Transit-Oriented Growth

Transit-Oriented Development (TOD) is a key driver of urban growth in cities with public transportation systems. In Curitiba, Brazil, the development of the BRT system has transformed the city's urban landscape, encouraging high-density development along the transport corridors. According to research by Cervero (1998), properties located near the BRT stations in Curitiba experienced a 25% increase in value compared to those further away.

Similar trends have been observed in other cities such as Mexico City and Cape Town, where investments in public transportation have led to higher real estate values and stimulated urban development. Table 1 below illustrates the changes in property values in selected emerging cities after the introduction of public transportation systems.

Table 1: Increase in Property Values After Public Transport System Introduction

City	Year of Transport System Introduction	Average Increase in Property Values (%)
Lagos, Nigeria	2008	15%
Bogotá, Colombia	2000	20%
Curitiba, Brazil	1974	25%
Cape Town, S. Africa	2007	18%
Mexico City, Mexico	2005	22%

Sources: WDI

4.4 Social Inclusion and Poverty Reduction

Public transportation plays a crucial role in promoting social inclusion by providing affordable and accessible mobility options for low-income populations. In Johannesburg, South Africa, the introduction of the Rea Vaya BRT system in 2009 has provided low-cost transport options for marginalized communities, particularly those living in the townships. A study by the South African National Department of Transport (2015) found that 75% of Rea Vaya users earned less than the national average wage, highlighting the system's importance in improving access to employment and reducing income inequality.

The Rea Vaya system has also contributed to poverty reduction by increasing access to education and healthcare. By providing reliable and affordable transportation, public transport systems enable low-income individuals to access essential services, thereby improving their overall quality of life (Venter, 2019).

4.5 Discussion

The findings from the case studies demonstrate that public transportation has a significant economic impact on urban development in emerging cities. Investments in transport infrastructure create jobs, increase real estate values, and promote social inclusion by providing affordable

mobility options for low-income populations. However, these benefits are contingent upon effective planning, adequate funding, and coordination with broader urban development policies.

Public transportation can serve as a catalyst for economic growth by facilitating labor mobility and reducing transportation costs. The increase in property values along transport corridors further demonstrates the importance of public transport in shaping urban development patterns. However, the potential for displacement and gentrification in areas experiencing rising property values must be addressed through policies that promote affordable housing and inclusive urban development.

Moreover, public transportation systems must be designed with social inclusion in mind. Ensuring that transport services are affordable and accessible to low-income populations is essential for reducing poverty and promoting equitable urban development. Governments must also address the challenges posed by informal transport systems, which often operate in parallel to formal public transport services in emerging cities. Integrating informal transport into the broader public transport network can help improve safety, efficiency, and affordability.

5.0 Conclusion

Public transportation plays a crucial role in driving economic development and shaping urban growth in emerging cities. Investments in transport infrastructure generate direct and indirect employment, stimulate real estate markets, and promote social inclusion by improving access to jobs and services. However, the success of public transportation systems depends on effective planning, governance, and integration with broader urban development policies.

Emerging cities must prioritize public transportation as part of their urban development strategies to foster sustainable and inclusive economic growth. By addressing the challenges associated with funding, planning, and social inclusion, cities can maximize the economic benefits of public transportation and create more livable, equitable urban environments.

References

Ahmed, S., Hoque, M. M., & Rahman, M. M. (2019). The role of public transport in employment generation and income growth in urban areas: A case study of Dhaka. *Journal of Urban Economics, 23(4)*, 54-68.

Banister, D., & Berechman, Y. (2001). Transport investment and economic development. *Journal of Transport Geography, 9(3)*, 209-218.

Cervero, R. (1998). The transit metropolis: A global inquiry. Washington, D.C.: Island Press.

Cervero, R., & Duncan, M. (2002). Benefits of transit-oriented development: Literature review. *Journal of Public Transportation, 5(4),* 11-31.

Cervero, R., & Golub, A. (2007). Informal transport: A global perspective. *Transport Policy, 14(6),* 445-457.

Glaeser, E. L., Kahn, M. E., & Rappaport, J. (2008). Why do the poor live in cities? The role of public transportation. *Journal of Urban Economics, 63(1),* 1-24.

Graham, D. J. (2007). Agglomeration economies and transport investment. *Journal of Transport Economics and Policy, 41(3),* 317-343.

Hidalgo, D., & Graftieaux, P. (2008). Bus rapid transit systems in Latin America and Asia: Results and

difficulties in 11 cities. *Transportation Research Record, 2072(1),* 77-88.

Litman, T. (2019). Evaluating public transportation benefits and costs. *Journal of Public Transportation, 22(1)*, 1-18.

Pereira, R. H. M., Schwanen, T., & Banister, D. (2017). Distributive justice and equity in transportation. *Transport Reviews, 37(1),* 139-157.

Sanchez, T. W. (2008). Poverty, policy, and public transportation. Transportation Research Part A: *Policy and Practice, 42(5),* 833-841.

Sohail, M., Maunder, D. A., & Cavill,
S. (2006). Effective regulation for sustainable public transport in developing countries. *Transport Policy, 13(3),* 177-190.

UN DESA. (2018). World
urbanization prospects: The 2018 revision. United Nations, Department of Economic and Social Affairs, Population Division.

Venter, C. (2019). Transport expenditure and affordability: The cost of being mobile. *Development Southern Africa, 36(3)*, 379-398.

World Bank. (2019). Urban transport and economic development in Lagos. World Bank Group.

COMMUNIOQUE ON THE 2024 CHARTERED INSTITUTE OF LOGISTICS AND TRANSPORT (CILT) ANNUAL CONFERENCE

Theme: *Transforming Nigeria's Transportation and Logistics Systems for Development*
Date: October 8-9, 2024
Venue: Nicon Luxury Hotel, Abuja

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1. Introduction

The 2024 Annual Conference of the Chartered Institute of Logistics and Transport (CILT) Nigeria was held in Abuja, bringing together transportation professionals, government representatives, industry leaders, and key stakeholders. The conference aimed to address critical issues affecting Nigeria's transportation and logistics systems, with a focus on how these systems can be transformed to drive national development and enhance African trade.

The opening session of the 2024 Chartered Institute of Logistics and Transport (CILT) Annual Conference witnessed a significant turnout, with diverse representation from across various sectors. Based on reports from the session:

Approximately 350 participants attended the opening session, which included government officials (FRSC, NPA, NIMASA et.c) 20%, industry experts (acidemias, consultants, CEOs, et.c) 30%, private sector 40% and stakeholders (CILT members globally) 10%.

Attendees came from all over Nigeria, with significant participation from Lagos, Abuja, Port Harcourt, and Kano (according to the report gathered by the rapporteur). Additionally, a few international delegates from neighboring African countries including, Chief Teete Owusu-Nortey, FCILT (CILT International President), Sharon Kindlesides (CILT Secretary General) and partners in the global logistics industry also participated.

General C.G. Musa, OFR, Chief of Defense Staff was the Special Guest of Honor for this year's conference.

2. Objectives of the Conference

The conference sought to:

- Provide a platform for discussing the challenges and opportunities within Nigeria's transportation and logistics sectors.
- Explore strategies for improving Nigeria's transportation infrastructure, with a focus on roads, railways, inland waterways, and ports.
- Highlight the role of logistics in boosting trade and industrial development in Nigeria and across Africa.

- Encourage policy reforms and increased private sector participation in the transportation and logistics industries.

President Speech Extracts

The President and Chairman of Council, Chartered Institute of Logistics and Transport (CILT) Nigeria Barr. Mfon Usoro, highlighted the critical role of transportation and logistics in driving national development. Her speech touched on several key areas:

The President emphasized the role of CILT Nigeria in professionalizing the logistics and transportation sectors through training, certification, and capacity building. He encouraged industry professionals to take advantage of CILT's programs to enhance their skills and contribute to the development of the sector.

She reiterated CILT Nigeria's commitment to working with all stakeholders to transform the country's transportation and logistics systems. She thanked the attendees, organizers, and partners for their contributions to the success of the conference and called for continued collaboration to implement the conference's resolutions.

3. Key Sessions and Presentations

The conference featured several technical sessions, panel discussions, and keynote addresses from industry experts. Notable presentations included:

Highlights from the Keynote Speaker:

Presentation titled *Strategies for Perfecting Nigerian Transportation and Logistics System as Catalyst for African Trade and Industrial Development* by Dr. George A. Banjo discusses key strategies for improving Nigeria's transportation and logistics systems to promote trade and industrial growth.

Key points include:

- The presentation highlights the importance of transport and logistics in national development, addressing how these systems foster social well-being, enhance market access, and support industrialization.
- It provides a comprehensive roadmap for improving Nigeria's transport and logistics sectors as critical drivers of economic growth.
- Nigeria's transport infrastructure, especially roads, is in poor condition due to lack of

investment and maintenance. The rail and maritime sectors face similar challenges.

- The imbalance between transport demand and the sector's ability to meet this demand is a critical issue, resulting in unreliable, costly, and unsafe services.
- The presentation emphasizes the need for policy reforms, increased private sector participation, and improved governance to address the sector's inefficiencies.
- It recommends a focus on improving intermodal transport, leveraging technology, and ensuring compliance with safety regulations to enhance operational efficiency.
- The document calls for completing Nigeria's unfinished transport reform agenda, including the establishment of a transport sector commission, professionalizing transport ministries, and fostering research.
- It also highlights Nigeria's declining logistics performance compared to other African nations, urging the adoption of international best practices to boost competitiveness.

Presentation 1 titled: *Modernizing Transportation Infrastructure: Paving the Way for a Sustainable Future* by Prof. Peter Siyan from the University of Abuja highlights the critical need for Nigeria to modernize its transportation systems to support economic growth and sustainability.

Key points from the presentation include:

- Transportation is vital to economic development, but Nigeria's infrastructure lags behind, with transportation contributing only 1-2% of GDP compared to 11-16% in developed nations.
- The presentation emphasizes the need for modernizing roads, railways, airports, and waterways to boost economic activities and improve quality of life.
- Nigeria's transportation infrastructure is underdeveloped, with roads being poorly maintained and congested. The railway network is insufficient, and ports are plagued with inefficiencies.
- The lack of investment, funding, and modernization results in high transportation costs, delays, and accidents.
- Roads: Expand and modernize the road network, attract private investment, and introduce sustainable mobility solutions.
- Railways: Invest in high-speed rail systems, improve connectivity, and integrate the rail network with other transport modes.
- Airports: Upgrade infrastructure to meet international standards and improve safety.
- Waterways: Modernize ports and develop inland waterways to ease road congestion and promote economic growth.
- Modernizing transport systems is essential for boosting trade, fostering economic growth, reducing carbon footprints, and improving public access to essential services.:

- The presentation concludes by acknowledging the hurdles, including insecurity, corruption, and poor maintenance, which must be addressed to achieve modernization.

This presentation underlines the importance of infrastructure development for Nigeria's future and the need for a comprehensive, sustainable, and technology-driven approach to modernization.

Presentation 2, titled: *Operational Excellence in Transportation Systems* by H.E. Amb. (Gen) Godwin George Umo emphasizes the importance of achieving operational excellence in transportation systems across various modes: air, surface, and maritime transport. Key points include:

- Operational excellence is vital for building robust, efficient, and reliable transportation systems. It focuses on improving service quality and system reliability, ensuring minimal downtime, and optimizing processes for greater productivity.
- The paper stresses the importance of integrating air, maritime, and surface operations for seamless intermodal transportation. This can enhance supply chain efficiency and minimize bottlenecks.
- Key strategies for optimization include leveraging advanced technologies like automation and AI for cargo handling, improving the resilience of transport systems, and adopting green technologies to reduce emissions
- Emphasis is placed on the critical role of safety and security in transportation systems. Compliance with international standards, such as ISO 27001, is essential to mitigate risks
- The paper stresses adopting green technologies to reduce carbon emissions, optimize fuel consumption, and improve waste management. This is crucial for achieving both operational excellence and environmental sustainability
- The document outlines strategies such as training employees, investing in modern infrastructure, conducting risk assessments, and integrating smart technologies for tracking and monitoring.

Presentation 3 titled: "Climate-Resilient Transport Infrastructure" moderated by Dr. Kayode Olagunju FCILT, mni, Deputy Corps Marshal Rtd, featured prominent speakers addressing critical aspects of integrating climate resilience into transportation planning and operations.

Prof. Ibrahim Choji from Nasarawa State University emphasized the need for incorporating climate adaptation measures into transport infrastructure planning. He highlighted strategies to enhance the resilience of urban transport systems against climate-related challenges. Engr. Emeka Agbasi, Managing Director of the Federal Roads Maintenance Agency, discussed practical approaches for embedding climate adaptation into road maintenance and infrastructure projects.

His presentation focused on policies and frameworks that can ensure roads remain functional during extreme weather events.

Engr. John Emmanuel Oche, a World Bank Senior Transport Consultant, addressed the broader challenges of climate change within the transportation and logistics industry. He explored innovative solutions and best practices for mitigating the impacts of climate change on transport systems and supply chains. Engr. Munza Ambima, Founder and CEO of Embedded Fan Limited, presented an assessment of the vulnerability of existing transport networks to climate change impacts. His analysis provided insights into identifying critical weak points in infrastructure and suggested ways to fortify them against future climate scenarios. Overall, the session underscored the importance of proactive measures in transport infrastructure planning to ensure sustainability and resilience in the face of climate change.

Presentation 4 titled: "Collaboration and Capacity Building," moderated by Dr. Ukadike from the Nigerian Ports Authority, featured key insights on enhancing the transport sector through collaboration and strategic partnerships.

Dr. Alban Igwe emphasized the diverse career paths available within the transport sector, highlighting the growing demand for skilled professionals. He discussed the importance of education and training in equipping individuals to meet industry challenges, urging participants to explore various roles from logistics management to policy development.

Dr. Kayode Olagunju focused on the need for regional transport integration, advocating for policies that foster collaboration among neighboring countries. He highlighted how improved cross-border connectivity can facilitate trade, enhance economic growth, and reduce transit times. Public-Private Partnerships in Transport Infrastructure. Chibuzo Ekwekwuo addressed the critical role of PPPs in developing and maintaining transport infrastructure. He outlined how these partnerships can provide innovative solutions, secure funding, and enhance operational efficiency, ultimately leading to better service delivery in the transport sector. Overall, the session underscored the importance of collaboration and capacity building to advance the transport sector, enhance career opportunities, and improve infrastructure through strategic partnerships.

Presentation 5 titled: “Climate-Resilient Transport Infrastructure” by Prof. Geraldine N. Okeudo focused on the importance of developing transport infrastructure that can withstand the impacts of climate change. Key points included:

- Vulnerability Assessment: Identifying critical transport networks susceptible to climate-related hazards such as flooding, erosion, and extreme weather.
- Design Principles: Advocating for the integration of climate resilience in the planning and design

phases of transport infrastructure projects.

- Policy Framework: Emphasizing the need for policies that promote sustainable practices and investment in resilient technologies.

The presentation titled “Strategies for Climate-Resilient Transformation of Transportation Infrastructure in Nigeria” by Oyesiku, K.O. provided a case study focused on Nigeria, outlining strategies to enhance the resilience of its transportation systems:

- Infrastructure Upgrade: Recommendations for upgrading existing infrastructure to better cope with climatic changes.
- Community Engagement: Highlighting the role of local communities in the planning process to ensure that solutions meet their needs and contexts.
- Public-Private Partnerships: Encouraging collaboration between government and private sectors to finance and implement resilient infrastructure projects.

Mr. Yusuf Adeniyi Jamiu in his paper titled “Economic Evaluation of Smart Traffic Management Systems in Reducing Carbon Emissions” examined the economic viability of implementing smart traffic management systems:

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- Cost-Benefit Analysis: Evaluating the economic impacts of smart systems on traffic flow and carbon emissions reduction.
- Technology Adoption: Discussing the potential for technologies such as adaptive traffic signals and real-time data analytics to enhance efficiency.
- Long-Term Benefits: Stressing the importance of these systems in reducing environmental impacts while improving urban mobility.

Presentation 6 titled: "Collaboration and Capacity Building," chaired by Major Gen. Bolaji Salami Rtd., featured two significant presentations.

The first presentation by Dr. Kayode Olagunju, titled "Regional Transport Integration: Cross-Border Links," explored the importance of transport infrastructure in fostering regional cooperation and economic integration among neighboring countries. Dr. Olagunju highlighted how effective cross-border transport systems can enhance trade, improve access to markets, and facilitate the movement of people, ultimately contributing to regional development.

The second presentation, delivered by Olusogo Adelowokan, focused on "Geographical Distance of Students' Hostels to Lecture Halls and Facility Ratio as Determinant to Academic Performance in Federal Universities in Nigeria." Adelowokan analyzed how the physical distance between student accommodations and lecture venues affects academic outcomes. He argued that closer proximity can lead to better attendance and engagement, thereby improving overall academic performance. The presentation also examined the adequacy of facilities and their role in supporting students' educational experiences.

The session emphasized the need for collaboration in transport integration and the importance of physical infrastructure in enhancing educational outcomes.

3.1. Transforming Nigeria's Transportation Infrastructure

The opening session highlighted Nigeria's need to modernize its aging and poorly maintained transport infrastructure. Key recommendations included:

- Comprehensive upgrades of roads, railways, and inland waterway networks.
- The urgent need for routine maintenance and the implementation of smart traffic management systems to address congestion and safety issues in urban areas.

3.2. Role of Logistics in African Trade

Experts discussed the critical role logistics plays in connecting Nigerian goods to regional and global markets. Presentations noted that:

- Nigeria's logistics sector suffers from inefficiencies that increase the cost of doing business.
- To remain competitive in the African Continental Free Trade Area (AfCFTA), Nigeria must improve its logistics performance through investment in infrastructure and the adoption of international best practices.

3.3. Case Study on Road Infrastructure in Asaba

A detailed case study on the state of road infrastructure in Asaba was presented, showing stark disparities in road maintenance and provision across key routes. Findings revealed that while some roads were adequately maintained, others—such as the Asaba-Benin Road—suffered from neglect, leading to safety risks and congestion.

3.4. Multi-Modal Transportation and Urban Planning

One session focused on the interrelationship between land use and transportation in Lagos. The presentation emphasized the potential of inland waterways to alleviate road congestion and

enhance the city's urban growth. It recommended an integrated transport system that incorporates road, rail, and water transport.

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4. Key Issues Discussed

Several critical issues affecting the transportation and logistics sectors were discussed, including:

4.1. Infrastructure Deficiencies

Speakers identified infrastructure gaps as one of the major challenges hindering Nigeria's development. Poor road conditions, outdated railways, and underutilized waterways were highlighted as significant obstacles. There were calls for:

- Immediate infrastructure upgrades, particularly on major transport routes.
- Strategic investment in transport systems that facilitate intermodal connectivity.

4.2. Maintenance Challenges

Inconsistent road maintenance practices were identified as a major cause of road deterioration. The conference stressed the need for routine, periodic, and urgent road maintenance programs, particularly in high-traffic areas like Asaba and Lagos.

4.3. Urbanization and Transport Demand

The rapid urbanization in Nigerian cities has created overwhelming demand for transportation services. However, the current infrastructure is unable to keep pace with the growing population, leading to increased traffic congestion, pollution, and accidents. The session on Lagos emphasized that a multi-modal transportation strategy is critical to managing the city's growth.

4.4. Policy Reforms and Private Sector Engagement

The need for comprehensive policy reforms in the transport and logistics sectors was a recurring theme. Key recommendations included:

- Revisiting Nigeria's transportation laws and policies to facilitate private sector participation.
- Establishing a regulatory framework to ensure that reforms are effectively implemented and monitored.

4.5. Logistics as a Catalyst for Trade

The logistics industry was recognized as a key driver of trade and industrial development in Nigeria and the wider African continent. It was noted that inefficient logistics systems increase the cost of goods and hinder Nigeria's competitiveness in regional trade. Solutions presented included the development of inland dry ports and logistics hubs to ease pressure on seaports and facilitate the efficient movement of goods.

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5. Resolutions and Recommendations

At the conclusion of the conference, participants adopted several key resolutions:

1. **Transport Infrastructure Upgrades**: Government and private sector actors should prioritize the modernization of Nigeria's transport systems, with a focus on integrating roads, railways, and waterways.

2. **Sustainable Road Maintenance**: Regular and structured road maintenance programs should be implemented, focusing on drainage, street lighting, and road markings to ensure safer transport networks.

3. **Multi-Modal Transport Systems**: To ease urban congestion, especially in cities like Lagos, inland waterways should be fully developed and integrated into Nigeria's broader transportation network.

4. **Logistics Sector Reforms**: Policies to improve the logistics sector should be fast-tracked to boost Nigeria's competitiveness in the African Continental Free Trade Area (AfCFTA). The establishment of dry ports and inland logistics hubs is vital to support trade growth.

5. **Policy and Legislative Reforms**: A transport sector commission should be established to oversee the implementation of reforms, and enabling legislation should be passed to encourage private sector participation in transport development. The National Transport Policy Document should be represented for the Federal Executive Council approval and immediate Implementation.
6. **Community Engagement**: Public awareness campaigns and community involvement should be promoted to ensure the sustainable management of road infrastructure.

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6. Conclusion

The 2024 CILT Annual Conference successfully highlighted the critical issues affecting Nigeria's transportation and logistics systems. The conference provided a platform for meaningful discussions on how these sectors can be transformed to support national development, boost trade, and enhance Nigeria's standing in the African market. It is expected that the resolutions and recommendations from the conference will guide future policy actions and investments in Nigeria's transport and logistics infrastructure.

Names of major papers presenters include:

1. Dr. George A. Banjo – MD/CEO of Transport and Development Consultants Partners Limited, who delivered a keynote address on strategies for perfecting Nigeria's transportation and logistics

systems.

2. Prof. Peter Siyan – University of Abuja, who presented on modernizing Nigeria's transportation infrastructure.
3. Prof. Ibrahim Dinju Choji – Presenter of a session on climate-resilient transport infrastructure.
4. Amb. (Gen.) Godwin George Umo – Presenter of a paper on operational excellence in transportation systems.

Signed:
Conference Chairman
Chartered Institute of Logistics and Transport (CILT) Nigeria