TRANSPORTATION TECHNOLOGY AND SECURITY: THE HUB FOR NATIONAL AND SUB-NATIONAL DEVELOPMENT AND SAFETY

# A PRESENTATION AT THE NIGERIA TRANSPORTATION COMMISSIONERS' FORUM ABUJA

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# INTRODUCTION

Technology has totally changed the face of the world as there is hardly any aspect of our society that has not been changed dramatically by it. This is because technologies are more efficient, they save us time, and they allow us to do things that we never could have imagined.



The transportation sector is not left out as it has also witnessed great and tremendous changes with the use of technology in driving its processes all over the world. Innovations in transportation through technology are essentially born out of five necessities: efficiency, ease, security, safety and development.



**Experts and transportation** professionals have been working sideby-side in ensuring that these new technologies get more people or things to their destination faster, safer and with the fewest amount of resources possible. This is why the world has witnessed a shift away from coal-powered trains toward ultra-fast bullet trains, luxurious aircrafts to budget-friendly, cost-saving models and a switch from petrol-guzzling vehicles to 100 percent electric cars.



Because of the enormous potential these technologies hold, transportation Technology has become one of the fastest-growing and highly-contested fields in the world as thousands of startups are racing to create the "next big thing" in the world of transportation.



paper seeks Therefore, this to importance of highlight the and Transportation technology security in driving National and sub National development and safety in Nigeria.

# OUTLINE

**INTRODUCTION** 

**CONCEPTUAL CLARIFICATION** 

FOCUS

**GLOBAL AND NIGERIAN PERSPECTIVES** 

SOME INNOVATIONS IN TRANSPORTATION TECHNOLOGY

SCIENCE, TECHNOLOGY AND INNOVATION IN TRANSPORT SAFETY AND SECURITY IN NIGERIA

**TRANSPORTATION AS A TOOL FOR DEVELOPMENT** 

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# **CONCEPTUAL CLARIFICATION**

**TRANSPORTATION**: Transportation is basically the movement of people and goods from one location to another through various modes such as air, rail, road, water, cable, pipelines and space.

**TECHNOLOGY** : This is the result or application of accumulated knowledge and application of skills, methods, and processes used in industrial production and scientific research (Liddell, et al, 1980)

It is regarded as the application of knowledge to the practical aims of human life or to changing and manipulating the human environment. Technology includes the use of materials, tools, techniques, and sources of power to make life easier or more pleasant and work more productive. While science is concerned with how and why things happen, technology focuses on making things happen (Merriam –Webster Dictionary 2022). **SAFETY:** Safety refers to measures taken to prevent accidents and injuries to personnel, property, and the environment (Aman Negi, 2023)

#### **SECURITY**:

Security in transportation refers to measures taken to prevent criminal activities, including theft, terrorism, and other forms of sabotage (Aman Negi, 2023)

**DEVELOPMENT:** This is a process that creates growth, progress, positive change or the addition of physical, economic, environmental, social and demographic components. The purpose of development is a rise in the level and quality of life of the population, and the creation or expansion of local regional income and employment opportunities, without damaging the resources of the environment (SID, 2021)

# Focus of this presentation

This presentation will attempt to answer the following questions

- a. Does Technology enhance Transportation, Security and Safety ?
- b. Do we need Technology?
- c. What type of Technology do we have or need?
- d. What are the benefits and the challenges?
- e. Then the way forward.
- f. How does Technology enhanced Transportation, security and safety improve Development?

This presentation skews towards the road and waterways because of the major activities of the participants – States Commissioners of Transportation and Permanent Secretaries.

# GLOBAL AND NIGERIAN PERSPECTIVES



In many developed economies of the World, transportation accounts for between 6% and 12% of the GDP. Further, logistics costs can account for between 6% and 25% of the GDP. The value of all transportation assets, including infrastructures and vehicles, can easily account for half the GDP of an advanced economy. (Jean-Paul Rodrigue, 2020)

According to the Third-quarter Economic Performance Report for 2021 released by the Nigeria Bureau of Statistics (NBS), the transportation sector made a significant leap in the quarter, making it one of the fastest-growing sectors in Nigeria in Q3 2021. The modes of transportation that made these impressive contributions to the economy were rail transport and pipeline (59.93 per cent), air transport (33.31 per cent), road transport (21.11 per cent), and water transport (16.30 per cent).



## SOME INNOVATIONS IN TRANSPORTATION TECHNOLOGY

**a. Maglev Trains:** Short for "magnetic levitation" Train designed to carry passengers at speeds up to 370 mph— more than 150 mph faster than the world's fastest passenger trains now in operation.

Developed by the China Railway Rolling Stock Corporation, the train will use electromagnets to levitate just above the track and provide forward propulsion, eliminating the friction caused by metal wheels on conventional trains, as well as the wear and tear and related maintenance expenses.



Source: www.asme.org

#### **b. Next-Generation Lithium-Ion Batteries:**

Many, if not most, major automobile manufacturers have invested in electric-powered or hybrid vehicles. Even with the higher cost and limited range, consumers buy electric vehicles because they are less expensive to operate and better for the environment. But the limitations of lithium-ion batteries—energy density, and safety must be overcome before electric cars gain significant market share. As a result, researchers are looking at ways to improve battery structure and electrode chemistry for batteries to hold more charge for a longer time. For example, silicon nanoparticles can outperform the commonly used carbon graphite electrode and can boost energy density by around 20 percent, promising longerlasting batteries.



Researchers at the DOE Battery Manufacturing R&D Facility test new technologies for hybrid electric and full electric vehicles. Photo: Oak Ridge National Laboratory

Source: www.asme.org

#### c. Safer Autonomous Navigation /Driverless Vehicles:

Rapid advances in computer technologies have accelerated the design and production of autonomous cars. They deploy camera technology to read road signs and see them in high resolution. Artificial Intelligence (AI) algorithms recognize objects on roads, guiding the vehicles on how to perceive their environment. Autonomous vehicles increase road safety and reduce harmful emissions A study at the University of Cambridge found that when driverless cars communicate with each other on the road, they create safer driving conditions. By sharing obstacle alerts with each other and creating openings for other cars that need to switch lanes, they can improve traffic flow by up to 45 percent.



Kayode Olagunju 26 Dec 2018 · 🞯

ENJOYED A DRIVERLESS VEHICLE AT THE UNITED NATIONS COMPLEX IN GENEVA, SWITZERLAND. NIGERIA WILL ALSO GET TO THAT LEVEL SOON .



Source: www.asme.org

#### d. Hypersonic Air Travel:

A new generation of aviation companies are building an engine that will be flying passengers at hypersonic speeds of Mach 5 (3,800 mph)— or even higher sometime in the near future. Such aircraft would complete the transatlantic New York City to London journey in about two hours (cutting off about 6 hours of the average flying time). A distance of 5586km or 3,471 miles.



#### e. Enhanced Delivery Drones

Drone technology continues to advance rapidly, especially regarding research and development of durable and lightweight materials, payload capacities, battery power, quieter operation, georeferencing tools, and sophisticated yet easy-touse software that monitor flights in real-time and analyzes flight data. These enhanced capabilities expand the ways drones can be used. For example, researchers at the American Academy of Pediatrics found that using drones may be the best approach for responding to medical emergency scenarios, especially in crowded cities with congested traffic.



#### f. Smart Bicycles

Researchers in China have developed an autonomous bicycle that can respond to voice commands due to a neuromorphic chip. In addition to recognizing voice commands, this chip includes hundreds of thousands of sensors that help the bike avoid obstacles and maintain balance.

Bikes can be versatile cargo vehicles with an addition of a platform behind the rider.



#### g. Green Energy

Green energy in transport includes all transport modes, alternative fuels, and technologies that reduce the negative impact on the environment. Eco-friendly vessels have precedence over conventional vessels because of reduced emissions of greenhouse gases. Ships are incorporated with energy-efficient propulsion systems and a streamlined hull design to reduce friction during navigation.



#### h. Zero Emission Electric Catamarans

German startup Unleash Future **Boats** develops *CargoOne*, a zeroemission electric truck on water. The truck solves the problems of transport with low water levels and allows the transportation of large quantities of goods without harmful emissions. It allows digital communication not only between boats but also between the land and water infrastructure.



#### i. Internet of Things

The Internet of Things (IoT) makes the transportation industry smarter. IoT, along with embedded sensors, gathers vehicular data to track the condition or performance of transport vehicles. IoT devices in traffic congestion systems predict and redirect vehicles to alternate faster routes, speeding up delivery. This reduces congestion resulting in less energy consumption. Moreover, the use of IoT in vehicles allows monitoring of fuel levels, driver safety, vehicular health, and more. Connected cars impose speed limits depending upon the nature of the traffic, which assists in preventing accidents. This ensures a smooth flow of transport vehicles and improved road safety.



#### j. Soar Robotics advances Vehicular Connectivity:

US-based startup Soar Robotics builds vehicle-toeverything (V2X) connectivity technology for autonomous vehicles and robots. It works on an Alenabled cellular modem that is integrable into the existing vehicular communication infrastructure. Using deep neural networking, the startup enables vehicles to connect to other vehicles via vehicle-tovehicle (V2V), vehicle-to-infrastructure (V2I), vehicle-to-network (V2N), and more.

It also facilitates integration with various protocols such as 4G, 5G, wi-fi, or LTE. This optimizes the latency, throughput, range, and reliability of the connected network.



# SCIENCE, TECHNOLOGY & INNOVATION IN TRANSPORT SAFETY AND SECURITY IN NIGERIA

Unfortunately, the use of transportation technology is not fully utilized in Nigeria. For a country with over 200 million people, the need for a robust means of transportation cannot be overemphasized. So, having a more efficient transport system will help stimulate growth as well as ensure continuity and longevity in the sector in terms of:

- a. Safety,
- b. Security,
- c. Transport Administration/Operation,
- d. Personnel management
- e. Development

# a. Safety:

- i. In terms of safety in road transport, Online Training Modules have been created to enhance drivers training and standards. The Federal Road Safety Corps recently migrated to the version 2.0 of its drivers training module for better divers training in Nigeria. Prospective drivers licence holders are mandated to attend driving schools for 26 days session.
- Also, Computer Based Training (CBT)
   Examination where a software has been designed in such a way that driving school operators or any other person cannot do the CBT for the trainee since the computer camcoder takes picture of the trainee randomly. It is the most frequent face that will appear on the certificates
- iii. Internet generated Certificate of Professional Proficiency is for training of already certified drivers on periodic basis based on certain modules using technology.





iv. Driving Schools StandardizationProgramme has also been digitalized inNigeria to enhance registration,certification and Monitoring andEvaluation of Driving Schools nationwide.

v. Establishment of Truck Driving Schools leveraging on technology will also enhance availability and quality of truck drivers. Dangote Truck Driving School has just been accredited by the Corps.

**vi. Driving Simulators**- also help in drivers training





vii. Certification of Transport Operators-The Road Transport Safety Standardization Scheme (RTSSS) of the FRSC monitors the training of drivers, vehicle conditions as well as the Operators compliance to Safety Standards on yearly basis for certification and classification of Transport operators.

viii. Establishment of Computerized Vehicle Inspection Centres to ensure that car owners comply with all the stipulated vehicle policies such as Road Worthiness, Vehicle License, Hackney Permit, Testing and Training of applicants for driver's license or rider card and in some cases, compliments the duties of other transport agencies.



Lagos State Computerized Vehicle Inspection Centre

## ix. E-ticketing and Mailing Of Tickets

Tablets are deployed for e-booking of offenders, crash scene management, black spot and other road condition reports. Tickets issued based on technology reports and without the knowledge of the violators can be mailed or messaged to the email/telephone numbers supplied in vehicle and drivers data. Arrest does not have to be physical. These enhance safety, security and revenue generation.

Cities should have smart devices mounted gantries to spot violators and criminals. As vehicles are driven over some bridges and gantries, those with expired vehicle document are easily picked for enforcement/ revenue purpose.





#### x. Improved Rescue Services:

Deployment of Internet-Of-Things Based Real-time Accident Alert and Reporting System in Nigeria will address delays in giving immediate medical attention to accident victims by providing early detection of accidents and communicating the location information of the accident spot via the GPS and GPRS modules immediately to the emergency responses such as FRSC, hospitals and victims' family on time in order to provide quick assistance for the injured victim(s).

**xi ELECTRONIC PAYMENT SYSTEM**: The introduction of the central integrated e-payment system by the government has made great strides in enhancing integration between the different mode of transport thereby bringing about seamless travel experience.

The component of E- payment includes: ticketing system, software, smartcards (cowry cards), card readers and validations, (on- board and standalone) and ticket lending machines.





#### xii. T**olling**

STI can be deployed for tolling of highways which will enhance more revenue

#### xiii. Automated Weighbridge System

Safety on the road could be better enhanced through the use of automated weighbridges which promptly deterred overloaded trucks and articulated vehicles.

xiv. Transport related agencies such as State Traffic Management Agencies eg Delta State Traffic Management agency, Lagos Metropolitan Transport Authority (LAMATA), Directorate of Road Traffic Service (DRTS), Kano Road Traffic Agency should fully embrace technology to enhance their operating efficiency.

#### **b. Security**:

**i. Automated Number Plates Production:** This was introduced by the Government to build and maintain a trusted and secure database of all registered vehicles in Nigeria. It has helped in boosting national security by supporting security agencies in combating crimes and recovery of stolen vehicles. There is need to deploy artificial intelligence like using robots to produce number plates

**ii. Drivers Licensing**: The Driving School Standardization Program has been upgraded to have and application where biometric capture and Computer based test (CBT) are being integrated to existing application in order to enhance integrity of the drivers licence process.



## iii. Automated Number Plates Recognition (ANPR):

By utilizing a network of smart ANPR camera in conjunction with other data sources, the system can provide a very valuable and data rich profile of traffic flows and analysis, traffic violations as well as detecting criminalities. This could also be used for revenue collection like toll fees, detecting vehicles with expired documents, picking wanted vehicles/drivers among others. These enhance security and safety.



Automated Number Plates Recognition Cameras on Lagos Roads

# iv. Safety, Security Detection and Enforcement

Law enforcement agencies particularly the Police and FRSC in Nigeria are presently deploying Cameras including automated number plates recognition devices, linking the Operational and Monitoring control centres to detect criminalities and violation to enhance security.





#### v. EMERGENCY RESPONSE

Nigeria has emergency number 112 while FRSC's emergency number is 122.

vi. Police has also created VGS Quick Emergency Reporting and Response System (QERRS), a smart policing initiative aimed at revolutionizing Police response to emergency and ensuring swift and efficient action in critical situations





## vii. National Internal Security and Public Alert System (NISPSAS/N-Alerts)

Federal The Government created NISPSAS to secure the Nigerian Road Users to improve the safety and security of road transport coommuters. The collaborating MDAs include the Ministries of Transportation and Interior, Nigeria Security and Civil Defence Corps (NSCDC), Federal Service (FFS), Nigeria Fire Immigration Service (NIS), Nigeria Correctional Services (NCoS) and Nigeria Police Force (NPF).

# nispsas.com.ng



# viii. Websites and Online Platforms

MDAs, States and other **Organizations have websites** and online platforms including social media for their operations and interactions with stakeholders and other members of the public.



ix. Crime Data Management System on vehicles, drivers and other citizens: Computer based centralized access system gives detailed information relating to vehicles, drivers and other citizens. This helps in tracking process for investigation purposes and detecting crimes in Nigeria.

#### x. Crowd Sourcing:

The deployment of technology to ensure that incidences on the roads are detected as soon as they occur is essential. Road users should be providing real-time traffic situation reports using smart system to give information that could enhance safety and allow making safer, more efficient driving choices as they commute. With about 222.5Million telephone subscribers in Nigeria as of the end of 2022 (NBS, 2023), a suitable **traffic app** could harness traffic information and Crowd sourced traffic situation report for enhanced vehicular movement.



Full Automation of Vehicle xi. **Registration Processes:** Government has utilized the deployment of an automated system for all vehicle registration processes as this will equip the Policing and Checking Agencies with on-the-spot ease in verification of vehicles and drivers credentials. It will improve the system performance and efficiency thereby providing a reliable security access in order to avoid tempering with stored data



# xii. Waterways/Maritime Security

# **SPECIAL MISSION VESSELS**

These vessels are equipped with sophisticated intelligence gathering capability for timely detection and response to illegal activities in the maritime domain. States and other stakeholders should also acquire technology enable boats to patrol their water to rid them of criminalities.



Special Mission Vessels delivered in Lagos



Four Damen SPa 1605 ballistic boats delivered to LNG

# xiii. Use Of Scanners in Maritime and Aviation Sectors

Scanners are deployed especially in the Maritime and Aviation Sectors to detect arms and other dangerous materials as well as illegal goods. People, goods, luggages, containers etc are routinely scanned to detect illegal items. This to enhance security.



# xiv. Automated System for Custom Data

This is an IT platform for single good declaration/Assessment. It develops, implements and maintains information Technology of the Nigeria Customs. It also handles Customs automation system. It improves customs operation, monitoring and management.



## xv. Artificial Intelligence in Transport Security

Artificial intelligence which is a copy of human intelligence aims at reproducing the human brain's functions. AI thinks and creates, speaks, judges and makes decisions.

Artificial Intelligence is used in vehicle inspection. It monitors the condition of vehicles, identify potential issues and optimize routes for improved efficiency and safety.



A robot at the Airport

#### xvi. Some Safety and Security Technology In Aviation Industry:

Since some States now have airlines, let us discuss a bit of some aviation security:

- Chatbots- simply known as Artificial Intelligence. This could play as a single gateway for passengers.
- Black box: This records audio of everything that happens on board. It helps in investigation in case of a crash.
- Indoor positioning system or beacon technology- beacon creates it possible for airports and airport venders to know the location of people. As well as to send them relevant personal information. Such as gate number, flight status, baggage carousel, or even a passenger's favorite coffee shop.
- Through the role of IT in aviation security, this new advanced technology may be used in the near future to make the aviation sector more convenient and advanced.

#### c.TRANSPORT ADMINISTRATION/OPERATION

#### i. Integrated Transport System:

The integration of different modes of transport will increase the efficiency of these modes by complementing one another with the aim of increasing the economic and social benefits. These transport modes are expected to complement one another by functioning together as a single important transport system. The Integrated transport system deals in best practice methodologies, managing physical and operating with the needed skills for better performance in which each mode is interconnected and the connection is highly unified including ticketing, scheduling, amongst others



Source: Centroidpm.com, 2020

# **ii. Transport Management System:** Transport Management system in Nigeria is still largely being impaired and underdeveloped. There is need to encourage the private sector to invest in the development of infrastructure which will accelerate the development of an efficient transport management system.

Source: business-wire.com



iii. Mass Transport Operation/BRT: Government at all levels should emulate Lagos State government in the introduction of electric mass transit buses/BRTs for public use which will help in reducing carbon emission and also reducing traffic congestion.

iv. In the near future, government should start thinking of operating driverless buses and robotaxis as it is evident in developed world.





#### v. Identification of Operators (Registration-Operator and Vehicle Cards and Badges:

With technology, the process of identification and registration of operators, vehicle cards and badges can be seamless, safe and transparent.

#### vi. Certification/Periodic Technological Inspection (PTI) and Competence Professional test:

PTI and certificate for professional competence (CPC) for drivers enhance transport management. These processes are carried out with the use of technology. Internet generated Certificate of Professional Proficiency is for training of already certified drivers on periodic basis based on certain modules using technology.



**Gertificate** Of Safe Driver This is Certify Mr. /Mrs For Outstanding Contribution to Safe Driver Issued By 0 Signature Date

#### vii. Conversion of Internal Combustion Engine (ICE) Vehicles to Natural Gas Vehicles-Compressed Natural Gas (CNG) and Liquified Natural Gas (LNG):

It is worthy to note that Innoson Vehicles in Nnewi, Anambra has showcased Compressed and Liquefied natural gas powered vehicles. The vehicles range from trucks, mini-buses, ambulances, long buses, SUVs, and several others. Some States like Lagos and Ogun have commenced the conversion of state mass transit buses including staff buses and public transport buses currently in circulation, to CNG to reduce the cost of transportation by charging rates that commensurate with what was obtained before subsidy removal. There is need for other States to also key into this initiative.



Innoson's CNG/LNG Powered vehicles



Lagos State mass transit buses

Ogun State mass transit buses

#### viii. Promotion of Electric Vehicles (EVs):

Sterling Bank recently launched an Electric Vehicle called Qore in its suite of renewable energy-powered transportation solutions. Qore will offer the purchase and financing of electric vehicles (EVs), EV charging stations, conversion of fossil-fuel-powered engines to EV engines, battery swapping services for modular EVs, and more.

Recently, the Federal Government also inaugurated a solar-powered electric vehicle charging stations at the University of Nigeria, Nsukka (UNN) which is a step in the right direction.

Also, Mustapha Gajibo from Maiduguri created a revolutionary solar-powered bus service that could be the model solution for cities across Nigeria.





Electric vehicle charging station

Sterling Bank;s Core(

3500

Mustapha's electric bus

#### ix. Need to embrace Smart city:

There is need for government to start building smart cities as this will enhance the quality and performance of urban services such as energy and transportation. The storage and efficient transfer of data by and between roads, vehicles, highways, bridges, traffic lights and even the relevant building is capable of assisting with the public in commercial transportation management, route information system, vehicle control and safety, and traffic congestions. (www.specialisedcivil.com)



#### d. Personnel Management

#### i. Automation of Staff Data:

Technology can be effectively utilized to automatically collect, process, and manage staff data in the transport sector thereby reducing the need for manual intervention while also improving data accuracy.

#### ii. Access Control:

Electronic access control systems that rely on user credentials and access card readers can be deployed to track employees' resumption time for duties, when they. close from work as well as their movement in and out of the office.



#### iii. Staff Performance Appraisal:

Technology can enable more frequent, flexible, and interactive Staff performance appraisals that can benefit both employees and employers. A goal-setting software that lets you create SMART (specific, measurable, achievable, relevant, and time-bound) key performance indicators can be utilized for staff annual performance evaluation report



## **TRANSPORTATION AS A TOOL FOR DEVELOPMENT**

Effective, efficient, safe and secured transportation achievable through deployment of STI will lead to national development. Transport is positively related to all forms of development (economic, social, environmental, physical and political). Improved transportation will lead to enhanced development as many opportunities are accessed through transportation.

Goods and services are redistributed from areas of surplus to scarcity where they attract better values. These create wealth and further releases for more development which in turn benefits individuals, Organizations, governments (sub-regional and national) and humanity as a whole. We can use STI to reduce waste, cost and improve efficiency, safety and security.

Let us develop our transportation to reduce poverty and improve on our national development.

# Benefits of Transportation Security and Safety Technology to Economic Development

Benefits of Transportation Security and Safety Technology to Economic Development Unemployment level Introduction of new transportation infrastructure creates employment opportunities for the masses which leads to economic development.

Reduces

Improved technology will generate more revenue which will bring about positive impact on the economy.

**Improved Revenue** 

Improved Productivity with a reduced cost.

> Definitely, the productivity level of the sector will improve which in turns will lead to economic growth.



#### **CHALLENGES FACED IN NIGERIA**

- Will power of government to invest in emerging technologies is low.
- There is government inability to provide conducive environment for technology application
- There is infrastructural gap i.e lack of infrastructure like constant electricity needed for technology application
- There is manpower –competency gap or not readily available
- Lack of modern Safety and Security System.

- Technology development requires some background data, unfortunately, most data are either not credible or not readily available
- Technology is to reduce discretions and corruption hence corrupt officials in the system will do every thing to sabotage the technology
- There is poor level of research and development in areas of innovation.
- Lack of modern transport
   policies.

#### CHALLENGES FACED IN NIGERIA CONT'D

- The technologically advanced countries are reluctant to transfer the technology or do so at exorbitant cost to developing nations
- The developing nations have poor maintenance culture for emerging technologies

#### Poor Funding

- Inadequate Competent Manpower Resources
- Poor infrastructure
- ✤ Weak Regulation

# WAY FORWARD

The following are the various ways through which the transport safety and security using technology can be improved upon:

a. Government should provide conducive environment for policy makers and operators to participate in technological innovation

b. Proper funding of the Ministries of
Communications and Digital Economy,
Maritime and Blue Economy and

#### Transport.

c. Improved funding of the States Ministry of Transport

d. STI agencies like NITDA should be better encouraged.

e. The right competences, right data, right analytical tools are needed for data management f. Training Institutions such as Higher institutions, ITF, Academies, ICDL etc to come up with necessary curriculum and manpower development programes in line with World Best practices for technological innovation g. There should be local and foreign exchange programes to train the right personnel on maintenance of parts of the technological innovations.

h. All States Ministry of Transport and their transport related agencies should fully embrace technology for better efficiency.

- i. Provision of modern safety and security system to drive and monitor the gaps in the system
- j. Encouraging more private sector involvement in the transport sector

k. All States and their MDAs should develop websites and operate online platforms including social media for better engagement with their stakeholders. 1. There should be proper monitoring and evaluation

m. Provision of research grants to help in research and development.

n. The Draft Transport Policy must be updated to accommodate emerging technologies and approved accordingly

o. Parts of equipment and devices should be made readily available

p. Government should encourage local development of STI as dumping of unnecessary technologies should be discouraged q. Improved Data Collection and Management- there should be robust Databases

r. Funding Facilities with low interests should be made available to Transport Operators

s. The Policy on STI should be fully implemented

t. Staff motivation- punishment and reward system necessary

Nigeria as a nation loses billions of dollars annually as a result of the gaps experienced in the Transport Sector. So, it is very important to build a more efficient and productive transport system using technology to drive the growth needed in our economy through attracting more investments (foreign and local) as well as creating more business and employment opportunities.

Therefore, having a more efficient transport system will help stimulate growth while opening the economy as well as ensuring continuity and longevity in the sector.

# Thank You

Discussion Time

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