NBRRI NEWSLETTER

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Special Edition

The Quarterly Newsletter of the Nigerian Building and Road Research Institute

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ROAD TRANSPORTATION IS CRITICAL TO FEDERAL GOVERNMENT CHANGE AGENDA

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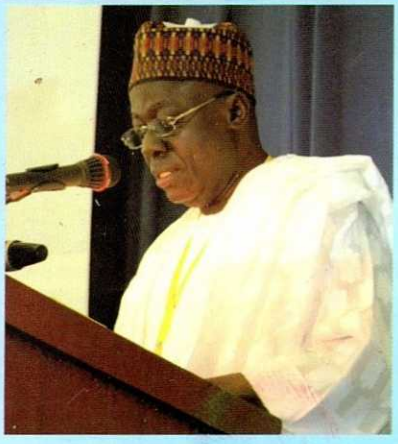
.Dauda S. Kigbu, Permanent Secretary, Federal Ministry of Works



NITT WILL COLLABORATE WITH NBRRI CLOSELY TO ACHIEVE COMMON GOALS

..... Aminu Musa Yusuf, *DG/CEO NITT* ...Pg. 20

ELDER STRATESMAN PROF. JERRY GANA VISITS NBRRI ADMIN HQTRS IN ABUJA

Former Minister and Elder Statesman Prof. Jerry Gana, paid a surprise visit to the Administrative Headquarters of NBRRI in Jabi recently. He was received by the DG/CEO of the Institute, Prof. Danladi S. Matawal. After a brief discussion, the renowned Professor was conducted round the Offices, Laboratory Facilities and Display Centre situated within the Office complex. At the end of the visit, Prof. Gana said he was truly impressed with the efforts of the NBRRI. He urged both Management and Staff of the Institute to continue with the good efforts while pledging to be a disciple of spreading the good news of the giant strides in NBRRI.

Prof Jerry Gana stressing a point making a point to DG NBRRI

Prof Gana perusing through some NBRRI publications

Prof. Gana being conducted round the Materials Testing Laboratory

Prof Gana shaking hands with some NBRRI Research Officers

Prof Matawal explains some NBRRI posters to Prof Gana

EDITORIAL

The Road transport sector in Nigeria is of great importance and concern to all and sundry including professionals, academicians, researchers, technocrats and indeed every Nigerian citizen. This is because the sector is responsible for the movement of more than 90% of persons, goods and services in Nigeria. This is against the backdrop of the 'almost stagnant' Rail and Water Transport sector; and the Air Transport sector considered reserved for the elites. In spite of the critical role which Road Transport sector plays in Nigeria's socio-economic development; the administration, operations and infrastructural development of the sector as well as the dwindling resource allocation and management has placed the sector under undue pressure. In view of these issues and the need for find solutions, the Nigerian Building and Road Research Institute (NBRRI) chose *RoadMap to Safe, Efficient and Sustainable Road Transportation in Nigeria* as the theme for the 2015 edition of its now annual, well attended, International Conference which took place between the 23rd and 25th of June 2015 at the Yar'Adua Centre, Abuja.

The International Conference which drew the attention, support and participation of critical stakeholders in the Road Transport sector, provided the platform and window for mutual interactions where policy, technical, operational and technical issues as well as R&D were x-rayed by technocrats, academics, operators, administrators, researchers, etc. in the Road Transport sector. The deliberations led to far-reaching short, medium and long term recommendations as well as the birth of the *Nigerian Road Transport Research Forum (NiRTReF).* This edition of *NBRRI Newsletter* is dedicated to bring you the highlights of the proceedings including excerpts of the technical papers presented, the Communiqué and other policy statements and actions.

As a key stakeholder in Nigeria's Transport sector, *NBRRI Newsletter* was able to conduct an interview with Aminu Musa Yusuf, the Director-General of the Nigerian Institute of Transport Technology (NITT), Zaria. This interview, which is as interesting as it is technical, provides an insight into some issues affecting the Transport sector in Nigeria.

Also included in this bumper-packaged edition of *NBRRI Newsletter* are the visits of some prominent Nigerians to NBRRI in the period. These included Prof. Boroffice, the Chairman of the Senate Committee on Science and Technology; Prof. Jerry Gana, a Nigerian elder statesman and former Minister of the Federal Republic of Nigeria; and, Dr. Abdu Bulama, the immediate past Hon. Minister of Science and Technology shortly before he vacated office.

NBRRI Newsletter invites you to relax and savor this bumper-packaged Conference Edition of NBRRI Newsletter .....

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NBRRI (VISION, MISSION & CORE VALUES)

BUILDING CAPACITY & SETTING THE PACE IN INDIGENOUS CONSTRUCTION TECHNOLOGY DEVELOPMENT

VISION

To evolve and use a comprehensive and integrated approach in appropriate technology development and transfer, sustainable capacity building and investment promotion.

So as to foster the application of environment-friendly and energy-efficient innovation construction materials, manufacturing technologies and cost-effective building and road construction practices.

Which will enhance job-creation, wealth generation and poverty reduction as well as nurture the emergence of vibrant, knowledge-based and highly competitive indigenous construction companies capable meeting global standards.

MISSION

Integrated R&D, capacity building and robust extension services in which technological innovation and knowledge-based practices in the fields of building, road, and engineering materials will be used to provide adequate and affordable housing and road infrastructure as well as increased economic empowerment.

CORE VALUES

- Professionalism
- Commitment and integrity
- Resourcefulness
- Innovativeness

NBRRI ORGANISES INTERNATIONAL CONFERENCE ON ROAD TRANSPORT

Cross-section dignitaries at the high table during the Opening Ceremony of the Conference

In continuation of its tradition of organising annual Conferences on topical issues in the Built Environment, the Nigerian Building and Road Research Institute (NBRRI), in collaboration with key stakeholders in the road transport sector, held the 2015 edition which was a 3-day International Conference on Road Transportation. The theme of the well-attended Conference, held between the 23rd and 25th June, 2015 at the Shehu Musa Yaradua Centre in Abuja Nigeria, was on Roadmap to Safe, Efficient and Sustainable Road Transportation in Nigeria. Apart from the Lead paper presented by Prof. Joop Goos, a globally renowned road transport expert and President of *La Prévention Routière Internationale (PRI)* in the Netherlands, several highly technical, policy and professional papers were presented under the following sub-themes:

- Road Assets Management
- Road Transport Safety Management
- Traffic and Mobility
- Road Traffic Accident and Management
- Financing Road Transportation Networks
- Rural Road Networks in Nigeria
- Sustainable innovations in Road Design
- Road Transport Operations and Management; and Construction, Safety and Green Roads

The Conference was organized in collaboration with critical Stakeholders in the Road transport sector. These included the Federal Ministry of Woks; the Nigerian Society of Engineers (NSE); Council for the Regulation of Engineering in Nigeria (COREN); Federal Road Safety Commission (FRSC); National Emergency Management Agency (NEMA); Nigeria Police; Directorate of Road Traffic Services (DRTS); and National Union of Road Transport Workers (NURTW).

The well attended event was graced by eminent personalities including technocrats; captains of the road transport industry; road transport operators, researchers and administrators; academicians, etc. The Special Guest of Honour was the Honourable Minister of Works, represented by the Permanent Secretary, Mr. Dauda Kigbu who gave the Keynote Address and declared the event open. The Chairman of NBRRI Governing Board, Chief Dele Okeya gave the Welcome Address; while the Permanent Secretary of the Federal Ministry of Science and Technology (FMST), Mrs. Winifred Oyo-Ita gave an Address. Other eminent dignitaries present included Rear Admiral Victor Adedipe, representing the Chief of Naval Staff; Squadron Leader Usman Akeel representing the Chief of Air Staff; ACP Yusuf Usman representing the

A Cross-section of delegates at the Conference

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NBRRI ANNUAL CONFERENCE IS A RALLYING POINT FOR STAKEHOLDERS IN THE BUILDING AND ROAD SECTOR

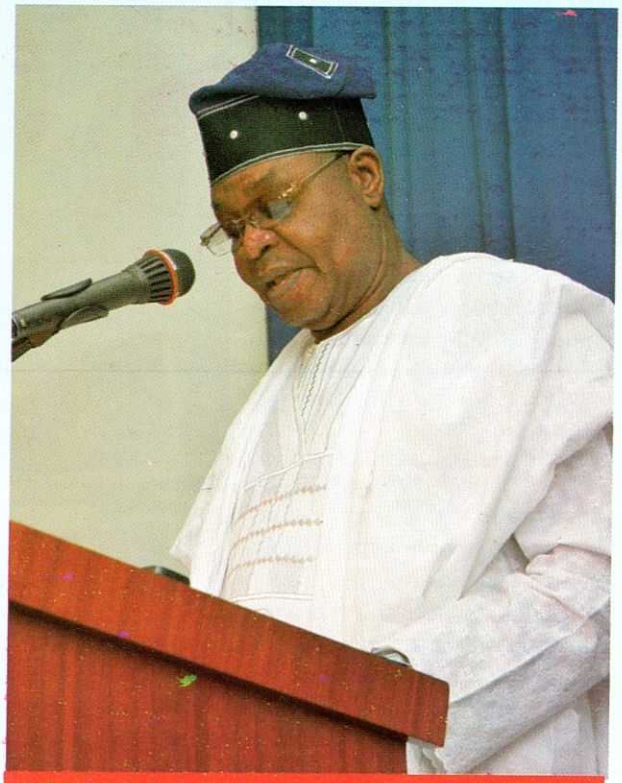
.....CHIEF DELE OKEYA, CHAIRMAN NBRRI GOVERNING BOARD

In his welcome address to participants and guests at the Road Transport Summit, Chairman of NBRRI Governing Board, Chief Dele Okeya said the annual Conference organized by the Nigerian Building and Road Research Institute (NBRRI) has become a hallmark of the Institute and a rallying point for stakeholders in the building and road sector. This according to him was because NBRRI has since 2011 been organizing Conferences on topical issues in the building and road sector. These he said included the NBRRI Stakeholders' Forum in 2011, Conference on Building Collapse in 2012, Conference on Road Pavement Failure in 2013 and Housing Summit in 2014.

He noted that the 2015 edition of NBRRI Conference which is focused on Safe, Efficient and Sustainable Road Transportation in Nigeria is apt considering the dire need to make our roads safer and road transportation less laborious, since most of the haulage of people, goods and services in Nigeria are through road transport mode.

Chief Okeya used the occasion to appeal to the Federal Government to adequately fund NBRRI and indeed other Research agencies in Nigeria in order to ensure that Nigeria's socio-economic development is driven by Science, Technology and Innovation based on integrated Research & Development, as is the global practice for developed countries. He also pledged the continuous support of the Governing Board to NBRRI towards proper enablement in meeting up with its mandate and set goals.

He welcomed the delegates to the Conference and wished them useful deliberations. Taking a cue from the outcomes of past Conferences, the NBRRI Board Chairman noted that he expects that at the end of the Conference, implementable resolutions that will transform the road transport sector in Nigeria will be evolved.



Chief Dele Okeya, Chairman of NBRRI Governing Board

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Inspector General of Police; ACM Jonas Agwu representing the Corps Marshall/CEO of the Federal Road Safety Commission (FRSC); Comrade Najeem Yassin, Deputy President of the Nigerian Labour Congress and President of the National Union of Road Transport Workers; and Ambassador Bagudu Hirse, former Minister of State in the Federal Ministry of Foreign Affairs. Others were Professor Seidu Mohammed, the DG/CEO of National Space Research and Development Agency; Prof. Eli Jidere Bala, the DG/CEO of the Energy Commission of Nigeria; Dr. Mohammed Jibrin, the DG/CEO of the National Board for Technology Incubation; Dr. A.A. Talabi, Director, Technology Acquisition and Assessment (TAA), FMST; Mr. Shaba Musa, Director Human Resources Management (HRM), FMST; Presidents of Council for the Regulation of Engineering in Nigeria (COREN) and the Nigerian Society of Engineers (NSE), etc.

The Conference had over 400 delegates in attendance that cuts across professionals, professional and regulatory Bodies, technocrats, researchers, the academia, consultants, NGOs contractors, etc. in the road transport sector. Other participants included delegates from Federal and State Ministries of Works, and Science and Technology, the private sector, among others. Useful and interactive sessions were held after which an all embracing Communiqué was issued.

ROAD SAFETY HINGES ON ENGINEERING, EDUCATION AND ENFORCEMENT

.....Professor Danladi S. Matawal, D-G/CEO of NBRRI

In his opening remarks at the NBRRI Conference on Road Transportation in Nigeria, the Director-General/CEO of the Nigerian Building and Road Research Institute, NBRRI, Professor Danladi S. Matawal, said the Institute has kept faith with its stakeholders for the past four (4) years by hosting the annual NBRRI conference, which has now metamorphosed into a component culture of the Institute.

Prof. D. S. Matawal, D-G/CEO of NBRRI

Prof. Matawal stressed in his presentation that road safety hinges on a fulcrum of 3-Es, namely Engineering, Education and Enforcement, and therefore all stakeholders are involved. He suggested that much of the informal education on road safety through constituted Neighborhood meetings, launching of Traffic Safety Newsletters, construction of Speed Breakers, Neighborhood pledges, Sign Postings, etc, in conjunction with safety enforcement and cognate agencies should be embarked upon and intensified.

Prof. Matawal reiterated that the theme for the 2015 conference which is on *Roadmap to Safe, Efficient and Sustainable Road Transportation in Nigeria*, is in line with the 11th May 2011 launch of the first ever Decade of Action for Road Safety (2011–2020) by the United Nations. He added that the decade provides a historic opportunity for countries to stop and reverse the current trend of high road safety challenges, which in the absence of an intervention, would lead to the loss of 1.9 million lives on roads by year 2020.

Furthermore, Prof. Matawal reminded the audience that from research, it has been shown that the risk of dying as a result of a road traffic crash is highest in the African continent at 24.1 persons per every 100,000 population while 38 percent of all African road traffic deaths are of third party nature, as they occur amongst innocent pedestrians. Bringing it closer, he revealed that Nigeria's 2010 road crash figures gave 33.7 traffic deaths per every 100,000 population, which is the highest in the West African sub-region and also very high in Africa. Based on this alarming statistics, it was emphasized that the issue of road safety should be given more attention. This according to Prof Matawal justified the resolve of NBRRI to host this year's Conference on Safe, Efficient and Sustainable Road Transportation.

Speaking further with regards to road crashes, Prof. Matawal said "It is important, in a public education forum of this nature, to always list what we know to be the common driver impairments such as: Alcohol effects, physical challenges/disabilities, poor eyesight, youthful exuberance and underage practices, old age, sleep deprivation, fatigue due to overwork or lack of sleep, drug use, distracting sounds (conversations and mobile-phone operations), etc." He added that it is also important to take the opportunity to spell out to engineers that certain standard accident site treatment selections for Single-site, Mass-action, Route-action, and Area-wide objectives are always available for custom-made choices to solve incessant accident collisions.

The NBRRI boss therefore said that this year's Conference has been designed to generate discourse that will usher in a definite set of interventions to achieve zero tolerance in road crashes. While agreeing that the Federal Road Safety Commission (FRSC) is endowed with the onerous task and responsibility to tackle road safety, Matawal added that the responsibility for enforcement lies with all stakeholders especially the Police, Army, paramilitary and VIOs who should partner to salvage the deteriorating situation.

However, the DG/CEO reiterated that NBRRI is being propelled to strive harder in order to serve Nigeria better by improving the quality of life of Nigerians in the areas of Building, Roads and Engineering Materials Sector of the Nigerian Economy. He posited that as an Agency, NBRRI believes that scientific solutions and best practices to reduce road crashes must be well researched and articulated; as such, in the last three years, the Institute has been involved in literary, laboratory and field academic and research works in line with its mandates in the thematic concerns of this conference. Amongst the numerous NBRRI cognate R&D projects on transportation and road safety, completed

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NBRRI CONFERENCES HAVE ALWAYS GENERATED DEEP DISCOURSE

..... Mrs. Winifred Oyo-Ita, Perm Sec, Federal Ministry of Science and Technology

"NBRRI is one of the agencies in the FMST that have shown great commitment and effort towards actualizing the objectives of the Federal Government in its mandate areas" This remark was made by Mrs. Winifred Oyo-Ita, the Permanent Secretary, Federal Ministry of Science and Technology (FMST) during her address at the Conference on Roadmap for Safe, Efficient and Sustainable Road Transportation in Nigeria, organized by NBRRI. She noted that conferences organized by NBRRI have always generate deep discussions among stakeholders on topical issues that are based on R&D outputs and outcomes and national trending matters of technical nature in the building and road sectors. These according to her have always involved technical presentations by researchers and stakeholders on issues of national importance as well as deepening and provoking research activities of NBRRI in the road and building sectors of the Nigerian economy.

Mrs. Winifred Oyo-Ita

She commended the Institute for partnering and collaborating with other relevant stakeholders to examine national challenges of safety, efficiency and sustainability in the road transport sector of Nigeria. The Permanent Secretary admitted that though Nigeria has high road crashes mortality rate which has adversely affected the economy of the country, she expressed optimism that issues discussed at the conference would help in reducing the occurrences of road crashes, while improving the chances of survival if involved in any traffic mishap.

Mrs Oyo-Ita who is the Chief host, said the FMST is looking forward to the communiqué of the Conference which she believes will influence policy formulation, evolution of action plans and further research in cognate areas that will lead to safer, efficient and sustainable road transportation in Nigeria.

She further stressed that the FMST will continue to support the efforts of NBRRI and other agencies under its aegis that demonstrate that the Science, Technology and Innovation environment in Nigeria is vibrant and functional.

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and ongoing in recent times, are the following:

- Road Safety Guidelines for Nigeria (RSG 2014)
- Quantitative Evaluation of Economic Losses due to Road Traffic Crashes
- Extent of Travel Time Increment due to Pavement Distress
- Road Safety Audit of a Road Section in Abuja
- Assessment of Speed Trends during Daytime & Night-time of Nigerian Drivers: Case Study of Abuja
- Assessment of Blood Alcohol Concentration (BAC) Levels Amongst Nigerian Drivers: Case Study of Abuja
- Compliance Study of Drivers at Signalized Intersections: Case Study of Abuja
- Investigating Road Rage and Aggressive Driving among Nigerian Drivers: Case Study of Abuja, and
- Nigeria Highway Capacity Manual (HCM)

He further revealed that while the Institute still maintains studies in its popular compressed bricks and interlocking block technologies, it has also extended into numerous other mandate areas such as:

- Pozzolana using clay, volcanic-ash and agro-waste raw materials
- Development of the 'Digitized Subgrade Soils Maps' for Nigeria
- Nanotechnological Materials for Road Pavement construction
- Road Pavement Failure Case-Studies using Back Analyses of Field Scenarios
- Building Collapse Case-Studies using Back Analyses of Field Failure cases
- Curriculum Development and Capacity Building Initiatives for Artisan Training, in collaboration with the National Board for Technical Education (NBTE)
- Development of Affordable Housing models for Nigeria
- Collaborating with COREN in its 'Nigerian Concrete Design Manual' project
- Collaborating with Federal Ministry Works (FMW) in its 'Roads and Bridges Federal Specifications Review' initiative
- Collaborating with the Federal Ministry of Lands, Housing and Urban Development (FMLH&UD) in its 'Social Housing conceptualization' scheme
- Studies on Cementatious materials, Adhesives and Glues for Buildings

ROAD TRANSPORTATION IS CRITICAL TO FEDERAL GOVERNMENT CHANGE AGENDA

.....Dauda S. Kigbu, Permanent Secretary, Federal Ministry of Works

The Permanent Secretary of the Federal Ministry of Works, Mr. Dauda S. Kigbu has noted that the new Federal Government will no doubt usher in a critical period of planning and visioning that will chart a way forward for the much anticipated giant leap in Nigeria's socio-economic development. He identified the Road Transport sector as one of the key areas that will attract the attention of Mr. President. This according to him is due to the fact that about 90% of Nigeria's haulage profile of people, goods and services is done through the Road Transport mode, which needs to be expanded and made safer, efficient and sustainable for optimum performance in fast tracking Nigeria's socio-economic development. The Permanent Secretary further noted that while Nigeria's total road network of 200,000km is second highest in Africa, its density per capita of facility in Nigeria with a population of 170 million is quite low when compared to other fast developing countries. Moreover, the limited development of Rail, Water Transportation and air transport sectors has put undue pressure on the Road Transport sector and needs to be given a boost. These views were expressed in his Keynote Address delivered at the International Conference on Road Transportation in Nigeria organized by the Nigerian Building and Road Research Institute (NBRRI).

Giving some statistics, Mr. Dauda Kigbu observed that road traffic fatality in 2013 was 6,544 and injuries between 2011 and 2013 averaged at 40,000. Mr. Kigbu said unfortunately that there are less than 100 ambulances dedicated to road safety emergency activities. All these, according to him, has adversely affected the desired impact of Road transportation to national socio-economic development as the yearly cost of road safety is estimated at 4 percent of the National Gross Domestic Product (GDP).

While concluding that the hosting of the Conference was justified, very timely, apt and appropriate, the Permanent Secretary stressed the need for the Conference to tackle the following specific areas that will engender meaningful impact in the Road Transport sector:

- Addressing the high rate of traffic crashes, casualties and fatalities in spite of considerable input and investment of government resources
- Promoting and sustaining effective Road Asset Auditing and Management system in order to ensure adequate management of Nigeria's road infrastructure for better service life and service delivery
- Redefining Mass transit system for cost-effective movement of people, goods and service by road, whether inter or intra-city, without putting undue pressure on road infrastructure
- Placing greater emphasis on research and development to address issues in the road transport sector for better service delivery
- Evolving and implementing innovative options to complement existing road transport operations for better service delivery. For effectiveness, this may include evolving inter-modal transport system, encouraging an integrated use of bicycles/motor cycles, incorporation of dedicated lanes for various road-based transport systems including physically challenged people, etc.
- Revisiting and implementing the National Transport Policy
- Creating Networking Platforms for *Road Transport Operators and Managers* on the one hand and for *Road Transport Research Organisations* on the other hand. This will encourage information

Mr. Dauda S. Kigbu , Permanent Secretary of the Federal Ministry of Works, delivering the Keynote Address

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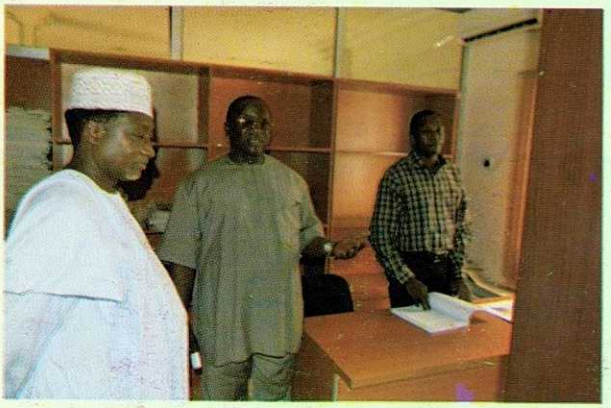
PAST MINISTER OF SCIENCE AND TECHNOLOGY VISITS NBRRI

In one of his last assignments as the Minister of the Federal Republic, the immediate past Minister of Science & Technology, Dr. Abdu Bulama paid a courtesy visit to the Administrative Headquarters of NBRRI on May 27th, 2015

He was received on arrival by the DG/CEO of the Institute, Professor Danladi Matawal, who after a brief discussion took the Minister round the complex to inspect among others, the Library and Materials Testing Laboratory.

Dr Abdu Bulama making a point to DG NBRRI Prof. Danladi Matawal



DG NBRRI, Prof D Matawal explaining a point to Dr. Bulama durring the facility tour

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sharing and ensure effectiveness in the management of their manpower, facilities and financial resources as well as operational activities and outputs for better service delivery to the sector and Nigeria's socio-economic development.

The Permanent Secretary reiterated that the core mandate of the Federal Ministry of Works is the provision and maintenance of Federal roads, and ensure that they are motorable, safe and efficient. To this end, he informed the delegates that the Ministry has embarked on robust rehabilitation and reconstruction programmes in recent years which have assisted in ensuring safer roads and reduced travel times between destinations. He however noted that the issue of Road Asset Management should not be overlooked as it is a good planning tool not only for safeguarding Nigerian roads but also for the projection of timely and efficient upgrades as well as planning reconstruction programmes.

Mr. Dauda Kigbu further suggested that the Conference may need to consider exploring strategies for the introduction of innovative programmes that will target optimizing road transport system in Nigeria, such as:

- ✓ The incorporation of pedestrian, bicycle, and motorcycle lanes to road designs especially in mega cities; and in rural areas to encourage it for future planning,
- ✓ Incorporating programmes to accommodate physically challenged persons in road transport systems,
- ✓ Promoting effective and efficient inter-modal road transport system that will be sustainable, and
- ✓ Promoting the use of bicycle as formidable and safe means of road transportation that could be integrated into the national road transport system.

Mr. Kigbu who was the Special Guest commended NBRRI for organizing the conference and recalled that the Institute started off from the old Federal Ministry of Works and Housing (FMW&H) in Ikoyi, Lagos, in 1978. He thereafter declared the Conference open and wished all delegates useful deliberations

PHOTO GALLERY

A cross section of dignitaries at the High table listening to the address of Prof. Matawal, DG/CEO of NBRRI

Chief Dele Okeya, Chairman of NBRRI Governing Board (L) with Mrs. Winifred Oyo-Ita, the Perm. Secretary of FMST

A cross-section of delegates at the International Conference

Prof. Danladi Matawal, DG NBRRI flanked by Chief Dele Okeya, NBRRI Board Chairman (L) and Amb. Bagudu Hirse

Rear Admiral Victor Adedipe, representing Chief of Naval Staff; and Engr. C. Okoye from the Nigerian Society of Engineers (NSE)

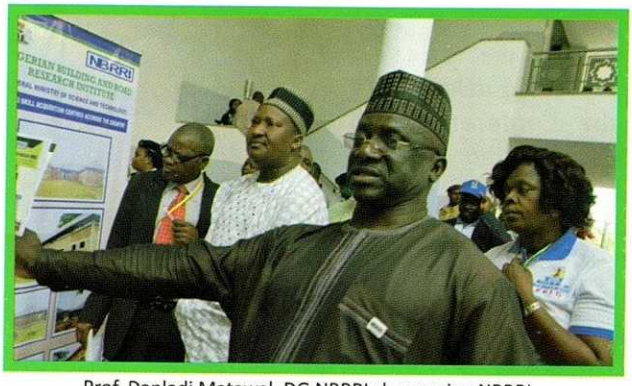
Dignitaries pose for a photo at the NBRRI International Conference opening ceremony

PHOTO GALLERY

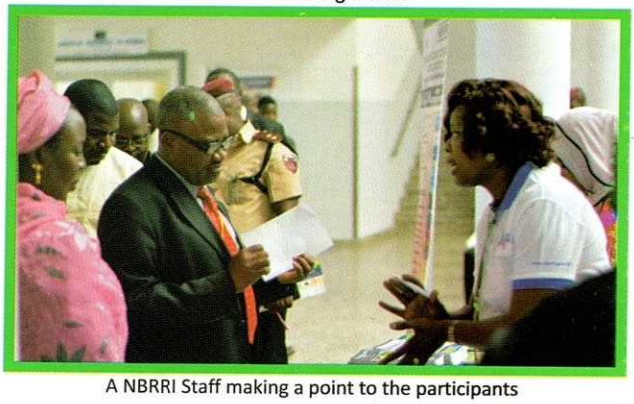
A cross section of dignitaries at the High table

NBRRI Exhibition stand

Prof. Danladi Matawal, DG NBRRI showcasing NBRRI Publications to the dignitaries



Prof. Danladi Matawal, DG NBRRI showcasing NBRRI technology to some of the dignitaries



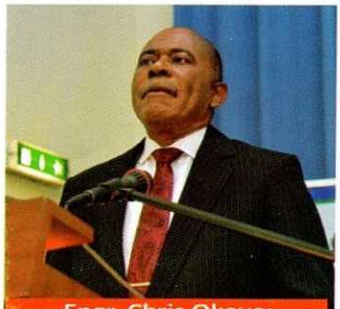
A NBRRI Staff making a point to the participants

A view of opening ceremony of the conference in session

GOODWILL MESSAGES

Danjuma Garba;
Director,
Directorate of Road Transport Services (DRTS), Abuja

The Director (DRTS) expressed his delight in identifying with NBRRI in the quest to evolve strategies for providing and restoring sanity in the road transport sub-sector in Nigeria. Noting that Research and Development is critical to national development, he emphasized the need for stakeholders in the transport sector to continuously take stock of their activities with critical look on what are not being done right. The aptness of this conference, he said cannot be over emphasized and NBRRI must be commended. In conclusion, he stated that all hands must be on deck; and that if we believe in safety, road safety rules must be obeyed.

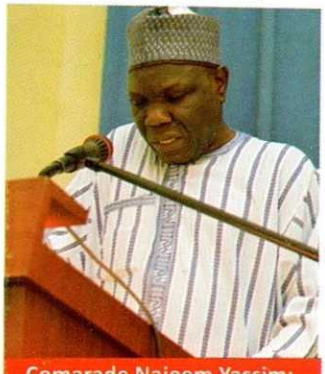


Engr. Chris Okoye;
Chairman,
Presidential Committee on Transport Reforms;
Represented the Nigerian Society of Engineers, NSE

Engr. Okoye observed that after the Power sector reform, the next crucial sector that requires an urgent reform is the transport sector. He assured NBRRI of a nexus between what the NSE is doing and what NBRRI is seeking to achieve through its annual Conferences, most especially this year's. He noted however that Nigeria has a deficit of institutional framework which funding or meeting infrastructural needs alone cannot address. He said other than funding, research agencies, the private sector and academics need to synergize so as to achieve the desired results. He also believes that the cordial relationship between the NSE and NBRRI must be sustained so as to ensure national development and progress.

Prof. Seidu Mohammed;
DG/CEO,
National Space Research & Development Agency (NARSDA)

Prof. Mohammed noted that the application of Science, Technology and Innovation to national development has been a major challenge in Nigeria; noting that most of our developmental strides are oftentimes devoid of technological content. He informed the delegates that his Agency, NARSDA, is well equipped to provide satellite imageries which give real time variables; and noted that it is a veritable tool that can be made available for R&D activities in sister Research establishments such as NBRRI. With the necessary training, traffic experts and researchers can utilize the Satellite to assess traffic challenges and proffer immediate responses as may be required.



Comarade Najeem Yassim;
President,
National Union of Road Transport Workers (NURTW)

Comrade Yassim welcomed delegates to the Conference and commended NBRRI's commitment to meeting its mandate through this forum especially in rallying stakeholders in the Transport sector to seek ways at proffering solutions and curtailing road transport challenges in Nigeria. He stated that research has shown that road transportation accounts for over 90% of transits in Nigeria. He noted that a major challenge in the transport sector is poor maintenance culture vis-a-vis the lean infrastructure provision. He opined that NBRRI's precedence and track records in recent times indicate that this Conference will yield positive results that will impart positively on Nigeria's Transport sector and indeed the generality of Nigerians.

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COMPARATIVE BENCHMARKING FOR SAFE, EFFICIENT AND SUSTAINABLE TRANSPORTATION FOR NIGERIAN APPLICATION

Joop Goos
President, La Prévention Routière Internationale (PRI)

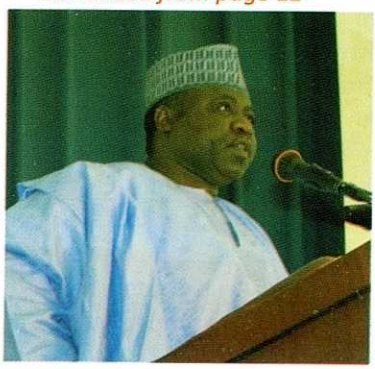
The presentation started with the background that there were 1.24 million reported traffic accidents worldwide; and noted that Nigeria has significant road traffic mortality and injury challenge with its attendant consequences on the overall economy of the nation. This problem according to the Paper is common in middle and low income countries, with Africa carrying a significant burden. While the Netherlands, used as a benchmark, has achieved significant reduction in the occurrences of crashes and mortality, efficiency and sustainability through deliberate strategies anchored on 3 main policy areas namely; the national transportation and mobility programme, the national cycling plan and the national road safety plan with private participation.

The presentation examined the road safety performance of Nigeria and The Netherlands. It highlighted the trajectory of The Netherlands in achieving an 83.6% reduction in traffic mortality within 4 decades; and presented the strategy of inclusive transport and mobility policies and development goals for consideration by Nigeria. The paper suggested that the policies should incorporate cycling as a way of achieving liveable and green-friendly cities; and concluded that the Nigerian condition shows tremendous potential for immediate improvements in road safety and sustainability especially with the existence of the Federal Road Safety Commission (FRSC) which is a lead agency for road safety management in Nigeria.

The presenter recommended the promotion of cycling as a means of sustainable transportation with its attendant health benefits and the economy cycling creates by providing employment. The cycling infrastructure which naturally interfaced with an efficient public mass transit system made up of public and private concessionaires as in the case of the Netherlands was presented as a system that may be adopted by Nigeria, to make cities safer and liveable.

While noting that despite the best efforts in engineering and education, accidents still happen; the presenter highlighted the deficits in emergency rescue infrastructure, especially, ambulances and paramedics trained in accident rescue schemes to maximise the "golden hour" where the chances of survival for the seriously injured road crash victims is the highest. The provision of ambulances and paramedics will create employment. With these and other considerations, the paper postulated that Nigeria will be able to succeed in becoming a reference in road safety on the continent and the world in general.

Continued from page 12



GOODWILL MESSAGES

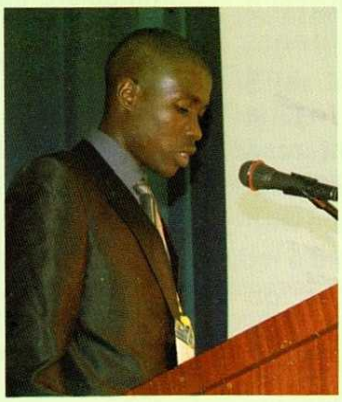
Dr. Mohammed Jibrin; DG/CEO, National Board for Technology Incubation (NBTI)

"NBTI is happy to identify with NBRRI in its noble pursuit for a turnaround of the transport sector"

ROAD SAFETY AUDIT OF KANO-ZARIA HIGHWAY

Nura, B and Hashim, M. A.
Bayero University Kano

The paper highlighted the consequences of increasing traffic volume that goes with rapid and uncontrolled urbanization; and emphasized that road safety improvement is becoming a major policy issue for road authorities in urban areas. It noted that Road accidents create both social and economic cost on the country's economy; and that road safety improvement strategies should display different solution alternatives within budgetary limitations of road authorities. The paper presented results of research conducted in which road safety audit practices from different countries were reviewed and best practice options applied to road safety audit in Nigeria.



The overall roadway section evaluated had a score of 5.7 showing that the overall effectiveness of the road was below average and would require road condition improvement. The most common hazards observed included fixed massive objects within the safety zone area, deficient guardrails, pavement damages like potholes and edge deterioration, missing shoulders, improper pedestrian crossings, improper commercial and bus stop locations. It was noted that majority of the hazards were associated with road design. Fixed objects, roadway cross section elements, bus stops, intersection layouts, roadway signage and pavement conditions were assessed for their potential to induce risk and danger to drivers and pedestrians. The findings pointed to a need for incorporation of safety measures at the design stages and during construction and maintenance of roadway facilities.

ROAD SAFETY AUDIT OF A SECTION OF THE NNAMDI AZIKIWE EXPRESSWAY, ABUJA

Matawal, D. S, Cinfwat, K. Z., Akinmade, O. D.
Nigerian Building and Road Research Institute (NBRRI)

The paper ranked Nigeria among the countries with the highest Road Traffic Crash (RTC) rates globally. To reduce the trend, the Federal Government of Nigeria (FGN) proposed the National Road Safety Strategy (NRSS) 2014-2018 which had Road Safety Audit (RSA) as a strategic tool for providing safe infrastructure and mobility. RSAs are powerful, low cost tools for quality and safety assurance of road traffic systems made up of the Human, Vehicle and Road Environment. The RSA was carried out on a 5.3 Km section of the Nnamdi Azikiwe Expressway in Abuja, extending from Mabushi-Berger flyover approach (in Utako District) to the roundabout before Area 1 (Garki District).

In reporting the results of the RSA, the paper revealed significant shortcomings and problems. It noted that certain basic Self Explaining Road (SER) features were not present while some were in need of repair or replacement. Other observed challenges included deficiencies with respect to the direction signs, the design of the median on the expressway which exposed the grating, lighting and other pole-mounted infrastructure to car crashes while some of lighting posts were unforgiving. The destruction and vandalism of gratings around the pedestrian bridge allowed indiscriminate pedestrians crossing of the expressway without using the pedestrian bridge. Other issues of note from the Audit exercise included non-enforcement of posted speed limits and non-functional status of some electronic warning signs and street lights at night. Based on these challenges, the paper recommended improvements to the expressway in order to achieve safety in road infrastructure and mobility along the road stretch.

ROAD TRAFFIC INJURY PREVENTION: WORLD HEALTH ORGANIZATION PERSPECTIVE ON ROADMAP TO SAFE AND EFFICIENT TRANSPORTATION

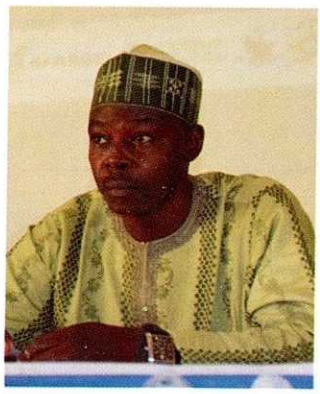
Lawal, R.B., Yahaya B. S., Fabiyi M. O (NBRRI) and Adekunle, A. (TRACE)

The paper noted that Road traffic injuries are a growing public health issues, disproportionately affecting vulnerable groups of road users, including the poor. More than half of the people killed in traffic crashes are young adults aged between 15 and 44 years. Every day around the world, more than 3000 people die from road traffic injury. Low-income and middle-income countries account for about 85% of the deaths and for 90% of the annual disability adjusted life years (DALYs) lost because of road traffic injury. This paper is a projection of the views of the World Health Organization (WHO) and the World Bank (WB) to create greater level of awareness, commitment and informed decision-making at all levels of Government, industry, international agencies and non-governmental organizations, for countries in order that scientifically proven strategies that are effective in preventing road injuries can be implemented.

The paper posited that an effective response to the global challenge of reducing road traffic casualties will require the following contributing to change in perception of road traffic injuries and adopting a more holistic approach that emphasizes prevention through action at all levels of the road traffic system; and helping in strengthen institutions and creating effective partnerships to deliver safer road traffic systems. Such partnerships should normally exist horizontally between different sectors of government and vertically between different levels of government, as well as between governments and non-governmental organizations. Projections made by the paper show that, between 2000 and 2020, traffic deaths will decline by about 30% in high-income countries but increase substantially in low-income and middle-income countries. Without appropriate action, by 2020, road traffic injuries are predicted to be the third leading contributor to the global burden of disease and injury.

ASSESSMENT OF ROAD TRANSPORT INFRASTRUCTURE INVESTMENT IN NIGERIA

Suleiman, A. Y. and Tijjani, A. Y.
Abubakar Tafawa Balewa University Bauchi (ATBU)



The presenter noted that in Nigeria, the road transportation system is very essential and provides the mode for transporting more than 90% of goods and services. This had resulted on gratuitous pressure on the road infrastructure with high tendency for subsequent damage and failure as the case may be. The development of the road infrastructure in Nigeria requires capital investment, and with the dwindling economy it becomes imperative for the Government to pursue alternative sources of funding.

The paper noted that the Nigerian Government founded the Infrastructure Concession Regulatory Commission (ICRC) in 2005 to attract private investment in infrastructural development. It adopted the public-private-partnership (PPP) models to enable partnering with the private sector for venture and technical expertise. After about ten (10) years, much had not been achieved in terms of private investment in the provision of roads in Nigeria. It is based on this premise that the study was conducted to assess the performance of the few road concession projects in Nigeria. The study indicated Lagos-Lekki toll road concession as the only successful PPP road infrastructure project in Nigeria. The study recommends sensitization of the private sector on the various PPP models and the review of PPP policy in Nigeria.

TOWARDS AN EFFECTIVE AND EFFICIENT ROAD-BASED MASS TRANSIT OPERATIONS IN NIGERIA

J.A. Ojekunle
Federal University of Technology, Minna


J.A. Ojekunl

The presenter noted that the failure of mass transit programmes in Nigeria in past years has necessitated the need for the evolution of effective strategies for the development of new mass transit schemes that would not only be efficient in enhancing passenger- carrying capacity and management but would guarantee pocket-friendly fares to low income earners.

Tracing the genesis, the presenter noted that Mass Transit schemes in Nigeria emerged during the economic recession of the mid-1980s as part of the economic policy programme to revamp the economy that necessitated the then Military Government to introduce the Structural Adjustment Programme (SAP). This was because the Mass Transit concept, which is generally focused on intra-city transportation, entails the movement of a large number of people at the same time using high capacity vehicles. The concept generally excludes the use of private cars or smaller vehicles which has limitations in its carrying capacity.

The paper however noted that mass transit schemes in Nigeria today have applications in inter-city mobility rather than intra-city movement of goods and service. He emphasized the misconception even among transport operators whereby smaller vehicles and trucks are also albeit wrongly labeled with mass transit inscriptions and used for mass transit operations. The presenter further highlighted and discussed some of the problems and challenges that led to inefficient mass transit in Nigeria, which included: stunted institutional framework; harsh economic environment; inadequate technical capacity and know-how; lack of spare parts; use of different brands of vehicles even by the same operators; absence or inadequate private-public partnership (PPP) franchising; poor management coupled with inadequate accounting system; inappropriate route operations, management, pricing and performance; poor consumer service quality assessment; inadequate vehicle fleet, maintenance and replacement; etc.

The paper concluded with recommendations which included the call for Government to provide the enabling environment and leave the operations to the private sectors that have the requisite expertise and track record.

LAND USE AND TRAFFIC PATTERN IN ZARIA URBAN AREA

Daudu, P.I., Yashi, J., Yisa, G.L., Akanbi, D. and Makwin, H.L.
Nigerian Building and Road Research Institute (NBRRI)


Daudu, P.I.

The paper noted that many cities in developing countries face urban mobility challenges as land uses uncontrollably change along major traffic corridors. Consequently, Traffic management becomes difficult due to the inevitable interaction between traffic and land uses. The presenter emphasized that Traffic delays are now the common experience due to difficulty in traffic management arising from the complex interaction between traffic and land use. Based on this, the interaction between land uses and traffic was studied to evolve strategies for sustainable traffic flow while the average daily traffic was taken into cognizance. The results presented the existing land use pattern in Zaria urban area in percentages and the dominant land uses along the transportation routes. It also showed a gradual pattern of how unplanned developments and land use changes affect traffic on some selected roads in Zaria and concluded that the interaction between land use and traffic was increasingly conflicting. The paper provided recommendations for proper land use management and development plans that would facilitate appropriate developmental control

PARKING DEMAND AND SUPPLY IN AN EMERGING INSTITUTION: A CASE STUDY OF BENUE STATE UNIVERSITY, NIGERIA

Vesta, M. Udoo and Timothy, T. G.
Benue State University Makurdi

The presenter mentioned that the study was aimed at examining the characteristics of parking demand and supply on the campus of Benue State University with a view to proffering planning solutions for the organization and management of its parking needs. Two specific objectives were determining the current parking supply parameters such as quantity of available parking facilities, the location, condition and layout of spaces of the parking facilities; as well as determining the current parking demand parameters such as cordon counts, parking accumulation, parking duration as well as User information on trip purpose, frequency, origin and user identity. Data was obtained from the field through observations, measurements and physical surveys and structured questionnaire. The study found out that parking supply on campus had a total of 171 available spaces, with 137 spaces not demarcated while 28 spaces are perpendicular and only 6 are angular. The locations of 4 lots were excellent while 9 were very good. The condition of 1 lot was excellent, 2 very good, 7 good and 3 fair. The peak demand is 606 vehicles with 69% for short term parking and 31% for long term parking. The study therefore recommended that parking should be consolidated in 3 areas. It was also recommended that surface parking lot should be provided with optimal capacity where users pay for the cost while 44% of provided parking spaces should be for faculty and staff with 33% for student and 20% for visitors.

IMPACT OF ON-STREET PARKING ON VEHICULAR MOVEMENT: CASE STUDY OF IDIROKO EXPRESS ROAD, OGUN-STATE

Ekandem, E. S., Adewale, A.K., Olatoye, T.T. and Fakeye, A.K.
Nigerian Building and Road Research Institute (NBRRI)

The presenter noted that in Nigeria, the dominant mode of inter- and intra-urban mobility is the auto-mobile motor vehicle. However, parking facilities as element of urban transportation development seems to be neglected in the face of increasing car ownership which generates enormous parking demand. It further noted available research results which showed that over 95% of vehicles are parked at one time or the other, while on-street parking constitutes problem of congestion, insecurity, environmental pollution, among others on Nigerian roads. This according to the paper was due to socio-economic factors and behavioural attitude of vehicle owners, inadequate parking facilities, etc. This study conducted examined the on-street parking on vehicular movement along Idiroko road, Ado-Odo/Ota Local Government Area of Ogun-state. The data collected through physical observations and questionnaires administered at the corridors of the study area where on-street parking and traffic congestion were prominent, involved the administration of seven hundred and seventy nine (739) questionnaires. Four hundred and twenty four (424) of these questionnaires were administered to parked vehicles owners, 240 questionnaires to shop owners/hawkers, 30 questionnaires to road transport unions, 10 questionnaires to statutory agencies and 35 questionnaires to pedestrian users. From the analysis, the research work according to the paper indicated that parking and traffic problems resulting in time delay and traffic congestion are caused by inadequate parking space, socio-economic factor, indiscipline, illegal signage and stalls on the road. The paper recommended that in order to reduce the problems associated with on-street parking on this corridor, emphasis should be given to driver education, road design should incorporate adequate provision of road furniture and lay-bye while enforcement of land use and land development by statutory agencies among others, should be given adequate priority.

COMMUNIQUE ISSUED AT THE 2015 INTERNATIONAL CONFERENCE ON "ROADMAP TO SAFE, EFFICIENT AND SUSTAINABLE ROAD TRANSPORTATION IN NIGERIA", HELD AT THE SHEHU MUSA YAR'ADUA CENTRE, ABUJA NIGERIA FROM 23RD TO 25TH JUNE, 2015

Introduction

The provision of safe, efficient and sustainable road transportation in Nigeria has become a great concern for government, professionals, stakeholders and the citizenry of the country. Road transport accounts for over 90% of passenger and goods movement within Nigeria. Over the years, the performance of the sector has been below par in view of the negative consequences of its operation and the state of the road assets both at the urban and rural areas.

In order to discuss and address these issues affecting the safe, efficient and sustainable transportation in Nigeria, the Nigerian Building and Road Research Institute (NBRRI), in collaboration with key Stakeholders in the construction industry namely, the Federal and State Ministries of Works, the Nigeria Police, DTRS, Nigerian Institute of Transport Technology (NITT), the Council for the Regulation of Engineering in Nigeria (COREN), the Nigerian Society of Engineers (NSE), the National Union for Road Transport Workers (NURTW), the Federal Road Safety Commission (FRSC), the Federal Road Maintenance Agency (FERMA), the Standards Organisation of Nigeria (SON), the National Emergency Management Agency (NEMA), and Lafarge Plc held an International Conference with the Theme **"Roadmap to Safe, Efficient and Sustainable Road Transportation in Nigeria", on the 23rd to 25th June, 2015** at the Shehu Musa Yar'Adua Centre in Abuja, Nigeria.

The conference sub-themes were structured into the following: Road Traffic Accident and Management; Financing Effective Road Transportation Networks; Road Asset Management; Road Transport Safety Management; Road Transport Operation and Management; Traffic and Mobility; and Sustainable Innovations in Road Design and Construction, Safety and Green Roads.

PARTICIPATION

Twenty-nine technical papers were presented while the event attracted over 400 participants from the various stakeholders in the Road transport sector.

OBSERVATIONS

The challenges of the road transport sector include the following: Poor road network that are unsafe and unforgiving; High road crash rates; Encroachment and refuse dumping on roads; Poor parking facilities and management; Poor road maintenance; Inadequate financing; Low use of technology; Ineffective road traffic law enforcement coupled with poor attitude of road users; Congestion; Ineffective road-based mass transit system; Appropriateness of road construction technology; Lack of synergy between road transport agencies and experts, among others.

RESOLUTIONS

At the end of the conference, the following were resolved to move the road transport sector

forward:

1. The need for the relevant agencies in the road transport sector to collect data that are relevant to road transport planning as at when due;
2. Provision of adequate funding of road transport infrastructure and maintenance in a coordinated and sustainable manner;
3. The adoption of smart technologies in road safety management and enforcement;
4. The need for proper road safety audit of roads in Nigeria and the certification of professionals in the field;
5. The need for a forum for the coordination of efforts of road related agencies and experts;
6. The need to implement building parking ratio in development control;
7. The need for attitudinal change among road users through education and enlightenment;
8. The need to fund research and development in appropriate technology for road construction in Nigeria and the formulation of specifications for rural roads in Nigeria;
9. The adoption of labour/community-based maintenance scheme for the management of rural roads in Nigeria to boost employment in rural economies;
10. The need to include non-motorized transport system in the National Transport Policy;
11. Road transport stakeholders at the national and state levels need to commence the inclusion of cycle/pedestrian lanes and other facilities in Nigerian cities;
12. The need to evolve a workable framework for road-based mass transit using the existing stakeholders in a reformed manner;
13. The need to have a functional and ICT based traffic signaling system in urban centres;
14. The need to develop a zero tolerance policy towards road traffic crash fatalities in Nigeria;
15. The need to fully implement practicable speed limits on Nigerian roads;
16. Harness the advantages of Education (formal and informal), Engineering and Enforcement for traffic and road operations in the country;
17. The conference resolved to establish the Nigerian Road Transport Research Forum (NiRTReF) with the secretariat at NBRRI with the "Transportation Growth Initiative (TGI)" and other stakeholders as members;
18. The need to adopt Cold Mix Asphalt (CMA) as a technology for road patch repairs and Warm Mix Asphalt (WMA) technology as a replacement to the traditional Hot Mix Asphalt (HMA) in Nigeria as well as engage tertiary institutions in further research;
19. The need to station FRSC team in motor parks to check drivers' indulgence in illicit substance abuse and for VIOs to carry out road worthiness test on vehicles; and
20. The need for prompt refill of scraped parts of roads during maintenance works by contractors.

IMPLEMENTING AGENCIES

The networking Agencies that have been identified to make these workable are:

- ✓ Federal Ministry of Works
- ✓ Federal Ministry of Transport
- ✓ Nigerian Building and Road Research Institute, NBRRI
- ✓ Federal Road Maintenance Agency (FERMA)
- ✓ Federal Road Safety Commission (FRSC)
- ✓ Council for the Regulation of Engineering (COREN)
- ✓ Nigeria Society of Engineers (NSE)
- ✓ NURTW & other road transport unions
- ✓ Directorate of Road Transport Service (DTRS)
- ✓ Nigeria Institute of Transport Technology (NITT)
- ✓ Federal Ministry of Finance
- ✓ National Assembly
- ✓ Universities with Transport Engineering, Transport Economics; Transport Planning courses, etc
- ✓ World Bank/DFID/Development Partners in the road transport sector.

NITT WILL COLLABORATE WITH NBRRI CLOSELY TO ACHIEVE COMMON GOALS

..... *Aminu Musa Yusuf, DG/CEO NITT*

***Aminu Musa Yusuf** is the Director-General /Chief Executive Officer of the Nigerian Institute of Transport Technology (NITT), Zaria. The Kaduna State-born DG had his primary and secondary education in Zaria and then proceeded for his degree at the Ahmadu Bello University (ABU), Zaria. After lecturing briefly at the Usman Danfodio University, Sokoto, Nigeria, he joined the NITT in 1992 where he gradually rose through the ranks to become the DG/CEO in 2010. Mr. Yusuf chaired one of the Technical sessions of the 2015 NBRRI International Conference on Road Transport. **NBRRI Newsletter** crew caught up with him during the Conference to hear his thoughts on a number of issues: Here are excerpts*

NBRRI Newsletter: Can you tell us about the NITT?

DG/CEO NITT: NITT is the apex Management Development Institute for the entire transport industry in the country. By this, I mean that we provide training and re-training of manpower employed in the sector and provide long term courses that lead to the award of Professional Diplomas and Certificates of Chartered Institute of Logistics and Transport (CILT). This is the professional body that is accrediting all transport industries worldwide.

Aminu Musa Yusuf,
DG/CEO NITT

In Nigeria, today, we have a National Institute similar to the 'CILT' which awards our Institute's Professional Diplomas and Certificates, since we provide them most of the Certificates, Diplomas and Advance Diploma for higher courses. The NITT has entered into a collaboration/affiliation with Ahmadu Bello University, and we have provided them with Post Graduate Diploma and Masters Courses in Logistics and Transport. However, in NITT, we offer this course as 'Transport Studies'. We also render consultancy services to the government and NGOs in the country on several aspects and problems related to the transport Industry. We also carry out research and monitoring of the industry, and provide vital information for the Government and Industry leaders on the service level of the transport industry in Nigeria.

NBRRI Newsletter: what are the basic qualifications to enroll into NITT?

DG/CEO NITT: For the professional cadre, we have Certificate and Diploma course. The Certificate course can be for drivers with only secondary school qualification. You can do certificate course for six months and return to the industry. After working for two years, you become eligible and qualified to apply for diploma course that will allow you to have the first grade of professionalism; that is Member of the Chartered Institute of Logistics and Transport. The Certificate will give you affiliate while the Diploma will give you Ordinary Membership. Then after working for three years, you become eligible to apply for the Advanced Diploma programme which is a one year professional course. This qualifies you to become a Chartered Member of CLT. This is as far as the professional programme goes. But for postgraduate and masters programmes, only graduates of universities are eligible to apply. You are either a graduate or if you are employed in the transport industry and have worked for at least five years and risen to some management level, then you can be considered for PGD direct. But the license is tailored for cooperate strategic management, that is corporate leadership; and even though you are a CLT member, you have to be allowed to achieve some level of management at the very top before you will be allowed to enroll for the Masters in Logistics and Transport. If you finish and have interest in academics, you can still enroll for PHD in ABU. The University will give you direct admission to read M.Phil/PHD in Logistic and Transport.

Aminu Musa Yusuf, DG/CEO NITT responding to questions from a *NBRRI Newsletter* reporter

NBRRI Newsletter: You have been in NITT for quite some time now. What will you say is the impact of NITT in Nigeria?

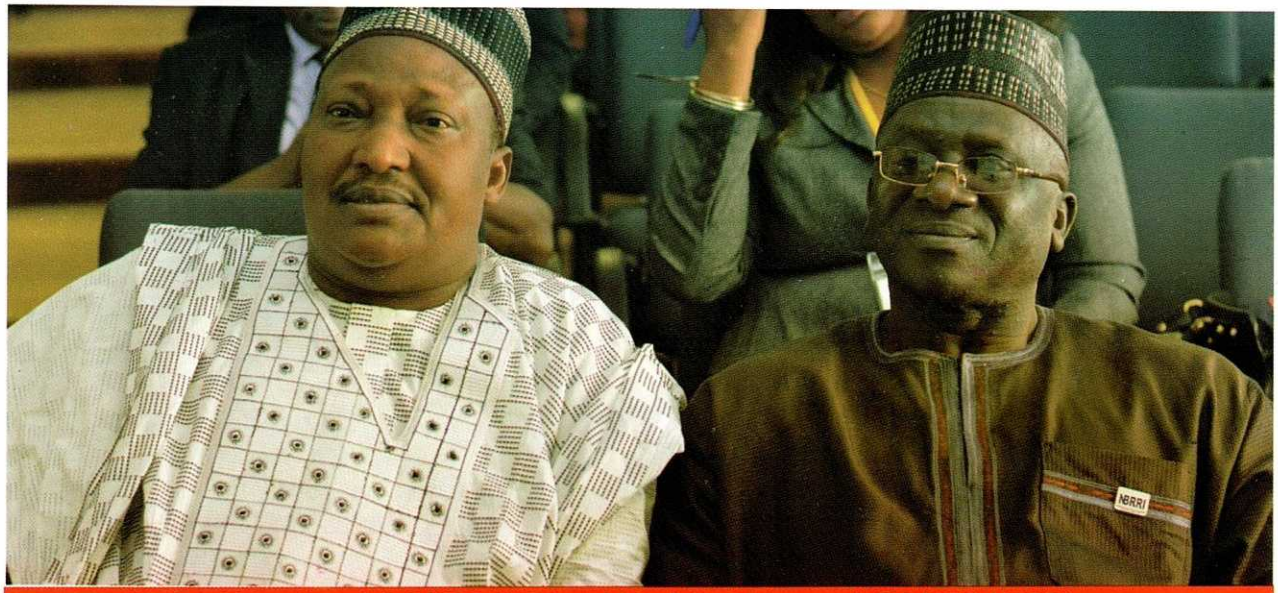
DG/CEO NITT: Well, since I came to NITT some 23 years ago, the mandate of the Institute has always been to provide capacity; and over the years we have been providing human capital development for the industry. The impact is to improve the efficiency of the manpower employed in the sector. You can see the impact in terms of reduction in the exodus to undertake such courses abroad. Before now, people used to go abroad for most of these Transport-related courses. But since NITT came on board, we have been able to save the country significant sum of money which would have been lost through capital flight. The longest course here is 2 years and is for only two hundred thousand naira. But if you go abroad for just six months, you can imagine how much government will spend on one person. It is indeed very expensive. So we have reduced courses and cost of human capacity development. We have also improved efficiency in road safety management indirectly by training drivers and improving their capacity. NITT is very famous in training of drivers, senior drivers and transport officers. We customize courses for them and this has improved safety on our roads significantly. We try to change the attitude of the Driver because most accidents are human factor-related, in addition to mechanical and environmental factors. But you might want to ask, what are these human factors? A driver's attitude!!! A driver who gets drunk, a driver who sleeps or a driver who doesn't know road signs, etc. need to change his attitude and orientation to achieve the desired competencies in driving safe. So at NITT, we try to re-orientate Drivers to become better and more efficient. We also train people on railway issues as well as officials from the aviation industry, NAMA and National Emergency Management Agency (NEMA) on logistics and on Management and Inventory Management, Security, Ports and Maritime, etc. All these areas are our domain.

> ".....since NITT came on board, we have been able to save the country significant sum of money which would have been lost through capital flight."

> "NITT is very famous in training of drivers, senior drivers and transport officers. We customize courses for them and this has improved safety on our roads significantly."

NBRRI Newsletter: You have been the DG of NITT since 2010: what are your challenges?

DG/CEO NITT: Since I came on board in 2010, the primary challenges is financial, because of non-release of budgetary funds. NITT is 100% on Federal Government budget up till now, and sometimes in the year our expansion needs are far below budgetary



Aminu Musa Yusuf, DG/CEO NITT and Prof. D. S Matawal, DG/CEO NBRRI

releases. You are aware that budgetary provisions are made and approved after scrutiny. But eventually, only about 25% to 30% are released. This is a serious constraint as we have been rolling over debts over the years. Since I came on board as DG/CEO in 2010, I am still carrying debt because contracts awarded based on approved budgetary provision and completed are badly affected in the sense that payments cannot be made due to significant shortfall in budgetary releases, and the funds are not there to pay them. For example, in 2014, the budget releases ceased coming since September and already we have awarded contracts; some, we even mobilized them and gave them a letters of award. They have finished their jobs and they brought their letters of job completion. Up till now, there are no funds to pay them. It is a big challenge. To compound the matter, this year's (2015) budget has not yet been implemented up till now, and we are getting to end of second quarter. That is the major challenge.

"....the Conference actually is well thought out, especially to come up with the Theme: "ROAD MAP FOR SAFE, EFFICIENT AND SUSTAINABLE ROAD TRANSPORT IN NIGERIA". In fact, I never knew about it until when I was contacted through your mails and when they brought the initial flyers. It is a very welcome idea and from my participation, I have seen that the papers are of high quality especially the session that I chaired where we looked at issues of modern strategies of GIS, ITS and Transport monitoring to see how we can solve problems of urban transportation system."

Secondly, there is apathy from industry as people prefer going abroad for courses that are locally available. I don't know why people are crazy about going abroad for courses that are locally available to suit our local conditions. For your information, we have tried to bring our programmes closer to all potential clients as Government has approved for NITT to open 3 Outreach Learning Centers in Abuja, Port Harcourt and Lagos. Today, the infrastructures are being provided, but only in Abuja that we have not gone up to 50% completion. If you go to Dakibiyu near Utako, we have a very big land there and we are building our Abuja Outreach Center; but due to development control problems in Abuja, the building has not gone far. We want to start doing our programmes in those areas. So for those who don't want to go to Zaria, they can stay in Lagos, Port Harcourt or Abuja to do their programmes. Also last year (2014), the Minister

approved two additional outreach centers in Enugu and Gombe to take care of North-East and South-East; and we will soon start our programmes there too.

NBRRI Newsletter: Sir, you chaired a session in NBRRI International Conference and some Staff of NITT also presented papers at the Conference. What do you think of the NBRRI Conference on road transport?

DG/CEO NITT: Well, the Conference actually is well thought out, especially to come up with the Theme: "ROAD MAP FOR SAFE, EFFICIENT AND SUSTAINABLE ROAD TRANSPORT IN NIGERIA". In fact, I never knew about it until when I was contacted through your mails and when they brought the initial flyers. It is a very welcome idea and from my participation, I have seen that the papers are of high quality especially the session that I chaired where we looked at issues of modern strategies of GIS, ITS and Transport monitoring to see how we can solve problems of urban transportation system.

What worries Nigerians mostly is the transport system especially urban road transport system. You know, everything you do mostly revolve around road transport. You start your journey by foot from your house to enter your car and go to places. So, the entire thing done on road transport is almost 90%. It is just lately that Nigerians are coming back to rail transportation. Actually the Conference is very self-provoking and I pray that the outcome of the Conference would be used to come up with the actual roadmap on how Nigeria can move forward in terms of improved, safe and efficient road transportation system in the country.

NBRRI Newsletter: Speaking about the outcome, if there is a place in the communiqué that NITT needs to execute, will you implement it?

DG/CEO NITT: Of course, whatever role is assigned to us, we are prepared to do it especially now that I have known the DG of NBRRI very well. In fact, we are thinking of collaborating in many areas. NITT has laboratories for road transport research. Also we are doing some research on road pavement and other things. So we are going to collaborate with NBRRI closely to achieve common goals relating to effective road transportation and durable highways in Nigeria. We know it is the purview of the Federal Ministry of Works to construct and maintain these roads by way of materials chosen, by way of maintenance schedules and other things. But nonetheless, we will contribute our quota.

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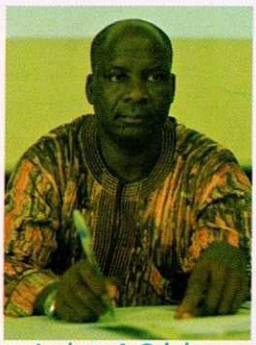
NBRRI Newsletter: Regarding the RIGAN GAMES which NITT is hosting, how prepared are you sir?

DG/CEO NITT: We got the right to host the 2015 RIGAN GAMES in 2013, but we did not immediately realize that 2015 is an election year. Also, the national election resulted to a change in Government. Secondly, the 2015 budget up till now has not been implemented. Though money was budgeted for RIGAN, no fund has been released from the 2015 budget to date. This is June and we planned to host the Games in November. This entails many things such as Construction of Games secretariat, upgrading our facilities and some other things. I am the Chairman of LOC and we met recently to agree to convert some of our buildings into the games secretariat and to collaborate with our neighbors. Luckily for us in Zaria, Ahmadu Bello University and other Institutions are always prepared to avail us of some of their facilities. Of course, most of the games will be hosted in NITT

Continued on page 24

SWEDISH 'VISION ZERO': A STRATEGIC POLICY OPTION FOR SAFER ROADS IN NIGERIA

Joshua A.Odeleye
Nigerian Institute of Transport Technology (NITT) Zaria


Joshua A.Odeleye

The presenter began with a quote from an eminent Nigerian Professor who in 1988 said "Nigerian roads are unsafe at speed" This according to the paper was due primarily to the pavement condition; and he proceeded to highlight the main causes of traffic accidents in Nigeria as being due to fatigue, drunken driving, over-speeding, presence of potholes along designated major operational corridors, among others. The aim of the paper was to review the success and advantages of the road safety vision and practices employed in Sweden for possible adoption in Nigeria. It was explained that the "Vision Zero" system in Sweden was based on the thinking that no loss of life is acceptable; and focus was predicated on the systems approach to road safety where the management of speed within the road system is the key. The paper stated that the operational speed of 50kph (31 mph) pegged for Sweden because of the understanding that lower speed results in lower impact on the body if any accidents occurs. It noted that Sweden has the most traffic cameras in the world for the management of road traffic issues and further mentioned that traffic calming on streets was enforced by deploying speed bumps and using roundabouts instead of intersections among, other measures.

Noting the poor synergy amongst road safety stakeholders in Nigeria, the paper highlighted the successful partnership between road users and relevant stakeholders in Sweden and suggested that such approaches be adopted in Nigeria. Other measures suggested included the determination and enforcement of the appropriate speed limit at all locations within the nation's road network. The paper concluded with the call for re-engineering of the Nigerian road system by deploying intelligent transportation technologies like traffic cameras, noting that the recommendations proffered will facilitate enforcement of traffic regulations and improved documentation of traffic behavior in Nigeria for research and enforcement purposes.

Continued from page 23

but where our facilities do not meet the standard, we can use our neighbor's own. On preparation, we are almost 30% prepared and very soon, we will start the publicity and making the necessary contacts. Some of our friends are willing to assist us somehow, but we have not gotten one kobo so far. All we are doing is to deploy the small resources that we have to begin preliminary work. The Committee has finished work; they have informed the National secretariat; they will soon come for facility visit in September to see how prepared we are. I hope that between now and next month (July, 2015) the budget may be released; and if that happens, we can hit the ground quickly and I am sure in November when the RIGAN Games kicks off, it will be one in town, one of the best and well organized RIGAN GAMES in Nigeria.

NBRRI Newsletter: Are you hosting to win or just hosting?

DG/CEO NITT: No, we are hosting to excel. I told my staff last week that we may not win all the games but we will excel in terms of organization because NITT is into transport and logistics and those are aspects that make planning succeed. If you are good in logistics, you will not fail. We will host to excel as a Centre of Excellence for Transport, Training and Research in Nigeria and West African sub-region.

NBRRI Newsletter: Finally, on a lighter note. You are fasting sir, but it is not showing on you, what is the secret?

DG/CEO NITT: It is showing on me and I would have taken some water but I cannot take it until 7:00pm. Anyway, fasting is ok. It is something I have been doing since childhood. As a young boy, I have been fasting and now am going into my sixties. May be when I reach 75years old, I will stop fasting. But for now, am enjoying it.

EVALUATING TRAFFIC CONGESTION IN NIGERIA AND REMEDIAL MEASURES: CASE STUDY OF LAGOS STATE

Adekunle A., Adewale A.K. and Ananso, G.N
Nigerian Building and Road Research Institute (NBRRI)

The paper highlighted that road traffic congestion remains a global phenomenon which also plagues cities in Nigeria, especially megacities like Lagos; and resulting in delays, unpredictable travel times, increased fuel consumption and monetary losses. The paper noted that the phenomenon has arisen from poorly planned road network and traffic management which gave rise to very chaotic traffic logjams. It went further to present a typical case study of Lagos – a megacity with over 12million people and the fastest growing city in Nigeria. The presenter mentioned that several steps have been taken by the Lagos State Government on the implementation of effective mass transit schemes which included the introduction of a Bus Rapid Transit (BRT) scheme, reputed to be the first in Africa with its dedicated-lane; provision of light-rail; expansion of several roads; encouragement of water transportation and integration of different public transport systems. The paper also noted the existence of other parallel inter-city traffic congestion along major corridors such as Lagos-Ibadan and Lokoja-Abuja highways; traffic logjams during weekends, public holidays and periods of major national festivities.

The paper indicated that the major causes of the congestion include lane indiscipline, high traffic density, low road network carrying capacity, poor traffic management and support infrastructure, low response to removal of broken down and crashed vehicles, etc. Furthermore, the paper identified the diverse patterns of road traffic congestion in relation to human, road traffic environment and causative factors in Lagos megacity and two major corridors of Lagos-Ibadan and Lokoja-Abuja highways, with a view to recommending some cost-effective and sustainable policy options for better and enhanced intra-urban mobility. It was recommended that the integration of enduring urban traffic planning and management strategies, such as effective mass transit, strict land-use adherence, effective traffic control and enforcement, integration of traffic management institutions, mechanism at discouraging excessive car usage, etc. should be pursued and entrenched in national development plans.

ROAD SAFETY PERFORMANCE EVALUATION OF SELECTED ROADS IN KANO, NIGERIA

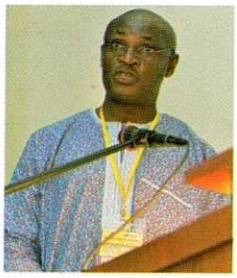
Hashim, M. A. (BUK) and Suleiman, A. Y. (ATBU)

The paper noted that Road safety performance evaluation has become necessary in view of the high rate of accidents on roadways and their implication for families and national economies. It presented a study conducted to examine nine roads in Kano, Nigeria with a view to assessing their safety performance. The study involved the generation of one-week Traffic volume data and an assessment of visual condition surveys to determine the extent of deterioration of the physical roadways. The results presented in the paper showed the following trends: that safety risk increases with increasing traffic volume, and that the risk increases with increase in segment length. As presented further in the paper, the visual condition surveys revealed that pavement deterioration contributed to heightened levels of risk on the roads. This required urgent attention to bring the roads to the state of traffic interactions based on safety only. Other conditions inimical to road safety included high illegal opposing flows, encroachment of pedestrian paths by traders, vehicle-pedestrian conflicts, vehicle-non motorised push carts conflicts and lack of pavement markings on the studied roads. The paper concluded that the overall safety performance of the roads indicated that safety improvements are necessary on all the roads studied.

APPLICATION OF GIS AS SUPPORT TOOL FOR PAVEMENT MAINTENANCE STRATEGY SELECTION

Adeleke, O. O., Atilola, B. Y. (Univ. of Ilorin)., Kolo, S. S., Abdulrahman, H. S. and Odumosu, J. O. (FUT Minna)

The paper defined Pavement Management System (PMS) as a set of tools or methods that can assist decision makers in finding cost effective strategies for providing, evaluating, and maintaining pavement in a serviceable condition. The paper reported how ArcGIS software is being used as a decision support tool for the maintenance of road networks; which was adopted in the case study conducted on University of Ilorin paved road network. The paper reported that Pavement Surface Evaluation and Rating was performed on each road in the network using pavement condition rating form and scale. It was further reported that Spatial and aspatial information of the road network which included the digital map of the road network, the coordinates of defects' locations, defect type and size, etc. were used to develop a relational database. The database developed in EXCEL software was imported into ArcGIS software to allow for ease of analysis and query of the database, and ease of visual and graphical displays of results. It was noted that the package developed, which can easily be updated, lends itself to simple and multiple queries of the database such as 'what is where and where is what' as well as queries on pavement condition rating, maintenance budget requirement of the road, etc. Based on the results, it was recommended that relevant agencies in the field of road maintenance should explore the use of GIS for the maintenance of pavements and other roadway assets to enhance decision making process.



INTER-MODAL TRANSPORT SYSTEM AS A TOOL FOR EFFECTIVE TRANSPORT MOBILITY IN NIGERIA

J. A. Tanko (MAUT, Yola)

The presenter emphasized that the economic strength of any nation depends on safe, cheap but efficient and sustainable passenger and freight movement nationally and internationally. Transportation of goods from point of origin to its destination can be done by a combination of transport modes referred to as inter-modal transport system, which was defined by the paper as an integrated management of transport modes for smooth, safe, cheap movement of freight and passengers supported by sufficient infrastructural and institutional facilities. The paper noted that Nigeria has railways, roads/highways, airports, seaports, waterways and pipelines that can be integrated for national and international mobility; and enumerated the benefits of inter-modal transport system to include: increased options or alternatives of transportation for both passengers and goods, enhanced facilitation of universal access and creation of opportunities for efficient operations of the services sector, among others.

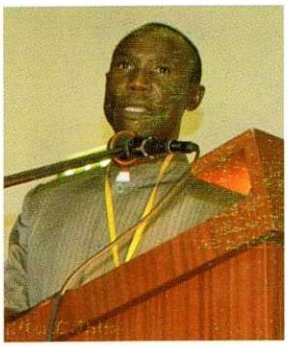
J. A. Tanko

The presenter however highlighted the general challenges of inter-modal mobility to include: lack of necessary intermodal transport infrastructure; failures among other transportation modes because individual mode operators focuses more on its own operations; poor funding amongst inter-modal transport operators that would create imbalances in traffic flows; and the lack of acceptable functional revenue sharing system amongst the various modes of transport. It further emphasized these challenges as the lack of interface with railways and large truck services from airports; the rights of way that can be utilized for intermodal infrastructure but which have been encroached upon by illegal developers; and non-linkage of most Nigerian ports with railways (e.g. Tin-can Island port in Lagos is without rail linkage, etc.

The paper concluded that the effective mix of transport modes are the necessary tools for effective mobility in Nigeria, given the unprecedented deterioration of major highways and roads resulting from the over dependence of Nigeria's haulage profile on roads. This also has the consequence of high traffic congestion in towns and cities. Furthermore, the paper advocated for the creation of an effective policy backed by strategic plan of action that would recognize the social and economic needs of Nigeria; and emphasized that the actions of corrupt Government officials and agencies constituting bottlenecks in the realization of full and effective inter-modal infrastructure have to be investigated and sanctioned in order to evolve an effective, safe and efficient inter-modal transport system in Nigeria that can fast track integrated socio-economic development.

THE CHALLENGE OF ROAD INFRASTRUCTURAL DEVELOPMENT IN THE ADOPTION OF GREEN BRT CRUSADE AND INTELLIGENT TRANSPORT SYSTEM (ITS) IN NIGERIAN CITIES

Dukiya J. J. Federal University of Technology (FUT), Minna



Dukiya J. J

The paper presented the imminent threats of global energy shortages, climatic change and urban traffic gridlocks which have necessitated the crusade for bio-fuel series, sustainable transport system, green mobility and Intelligent Transport System (ITS) among the developed and developing countries. It gave an overview of how modern vehicles now carry inbuilt sensors for Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) interface operation. It further indicated how Nigeria and Nigerians do not seem to show the urgency and imperativeness as other countries have shown by way of adopting globally recognized auto manufacturing factories vis-à-vis the requisite human capacity building and road infrastructure. The presenter noted that the procurement of latest vehicles is not commensurate with the trained capacity for their maintenance; and as such, the vehicles end up in a state of disrepair earlier than anticipated largely due to lack of technical competencies.

Also captured in the paper was the need for road infrastructure to support new transit schemes such as BRTs, which is currently lacking in many Nigerian cities. The paper further examined the state of ITS infrastructure and human capacity development in relation to hybrid buses for effective BRT in the country; and the survey methodologies adopted included personal field observations of major intra-city arterial roads and survey of urban transit buses using digital camera. Also, secondary data from Google image were used to assess the levels of road infrastructural provisions. The survey findings as reported in the paper indicated that there was a wide gap between reality of BRT in Nigerian cities like Lagos and Abuja where passengers still waste about 5 hrs daily in transit, as against the ideal and expected efficiency of BRT in more developed countries.

MODELING QUEUING SYSTEMS IN INTER-CITY BUS TRANSIT: SIMULATION MODEL

Olowosulu, A. T. Ahmadu Bello University, Zaria

Olowosulu, A. T

The presenter indicated that the main objective of the paper was the development of a computer simulation model based on the observed exponential model for queuing systems in inter-city bus transit. For this, data on loading and queuing characteristics of buses serving the Zaria-Kaduna public transport route were collected at carefully selected terminuses. The computer simulation model was variously modified to check the adequacy of probable remedies of reduced supply of buses, increase in passenger demand and a regular intake of buses to the terminus. The findings, according to the paper, generally indicated that the regular intake policy at a rate of about 0.125 buses/min (7.5 buses/hour), will not only minimize the vehicle queuing time being experienced by the operators, but will also substantially reduce the passenger waiting time and improve the general efficiency of the system operation. It further noted that when the mean arrival rate of passengers is increased in the simulator from the observed value of about 1.65/min to 1.87/min, and later to 1.97/min, the measures of effectiveness show some improvements. For example, the mean queuing time of buses is reduced to 81.75 minutes and 66.65 minutes respectively from the observed 128.9 minutes.

TRAFFIC COMPLIANCE STUDY AMONG NIGERIAN DRIVERS: CASE STUDY OF ABUJA METROPOLIS

Matawal, D. S., Makwin, H.L. and Akinmade, O. D. Nigerian Building and Road Research Institute (NBRRI)

The presenter stressed the fact that the advantages of traffic signals in regulating traffic at intersections are enormous but may cause problems if not properly regulated. It was emphasised that the unjustified use of traffic signals may increase intersection delay, crash frequency, red light violation, fuel consumption and might encourage the use of alternative routes. It was further noted that traffic forecasting, analysis and deployment of signalized intersections would be meaningless if drivers do not comply with traffic regulations and obey traffic-controlled devices.

The paper reported the study carried out on the assessment of compliance rate of drivers at signalized intersections in Abuja metropolis in order to ascertain whether drivers, pedestrians and other road users obeyed the red light or not. The choice of the intersections was such that they were far from regular police enforcement posts because driver behaviour in urban areas would generally be affected by heavy police presence. The paper however noted that Abuja has 162 signalized intersections; and most times, law enforcement agents were not present on the road length or at signalized intersections.

The scope of the study, as outlined in the paper, included six signalized intersections in Jabi District (3No.) and Wuse District (3No.) where traffic data such as traffic volume and driver's compliance were collected. Data on No. of Vehicles, No. of Stops, No. of Arms and No. of Non-Stop vehicles, etc. were subjected to regression analysis to establish the relationships between these parameters. The models fitness or coefficient of determination, denoted by R^2 was found to be 0.97 which showed a very significant relationship between the variables (independent and dependent). The results of the study further showed that 65% of vehicles came to a complete stop, 28% vehicles did not stop while 6% showed reluctance in stopping. The presenter concluded that from the study, 95% of all vehicles using Abuja intersections come to a complete stop during the morning off peak periods; and highlighted the need for further studies to be conducted at night and day times as well as wet times, that would not only increase the sample size but would also utilize other data collection methods and new technologies, such as driving simulators for comparison between alternative traffic control systems. The paper opined that this will provide a comprehensive driver behaviour at signalized intersections under all possible conditions.

IMPACT OF ROADSIDE REFUSE DUMP ON ROAD TRANSPORT: A CASE STUDY OF SANGO- OTA IDIROKO ROAD

Lamidi R.B., Okonofua E., Oladipo T. and Fakeye, A.K.
Nigerian Building and Road Research Institute (NBRRI)

The paper observed that road transport is the most commonly used mode of transportation in Nigeria and accounts for more than 90% of the sub-sector's 3% contribution to the Gross Domestic Product. Good maintenance of road networks is very crucial for effective road transport. The road network in Sango–Ota metropolis located in Ado-Odo-Ota Local Government Area of Ogun State, are poorly maintained and overused as alternative modes of solid waste dump. This study examines the road network situation and identifies various road dumpsites and the impact of roadside dump on Road transport safety within the study area. It also considered accidents risk at dumpsites, inhibitions of traffic movement and other challenges on road transport. One hundred and fifty questionnaires were administered in addition to holding group discussions with waste management officials of the State. Consequently, descriptive and statistical methods were employed to analyse the data. The paper provided highlights of the results of the study which includes the following: the level of road accessibility and transport services are poor and inadequate; inhabitants had no option but to bring their wastes to the road side; the cost of disposing wastes is high and unaffordable to the inhabitants; flooding due to rainfall results in channel blockage; there are significant accidents at dumpsites and delays in traffic movement. Also due the reduction in road width arising from road side dumps, accident rates are very high. The study suggested new approaches that could be used by institutions and government agencies for Municipal Solid Waste Management.

NON-MOTORIZED TRANSPORTATION (NMT) AND URBANIZATION: THE FUTURE OF MOBILITY IN NIGERIAN CITIES

Emmanuel John, Federal Road Safety Corps (FRSC)

The presenter noted that non-motorized transport system refers to transport mode not powered by external source such as electricity, fossil fuels, etc. but powered by the physical energy of man or animals. The paper stated that the non-motorized transportation unit of the FRSC is responsible for developing, managing and articulating all matters on non-motorized transportation for FRSC, and for recommendation to appropriate authorities nationwide.

While noting that the transportation modes in Nigeria are primarily motorized, the paper mentioned that it limits the ability to enjoy mobility based on mindset, infrastructure/facilities, law/policies, acquisition and usage. It emphasized the Nigerian attitude where little or no relevance is given to trekking and the use of bicycles but rather on the use of motorcycles, cars and airplanes. He noted that 32% of the world population live in countries with national policies that promote walking and cycling as an alternative to motorized transport while 44% do not have policies that promote public transport as an alternative transport, and less than one third of countries have such policies.

Emmanuel John

The paper further stated that the FRSC and other national stakeholders recently completed work on a national cycling policy and strategy. It observed that the condition of walking globally has resulted to global pedestrian deaths, 38% in Nigeria due to several factors such as incomplete streets and inadequate signage, etc., Though the non-motorized mode of transportation was considered relevant and important, the paper added that the major challenges included insufficient knowledge, ego, competition, status symbol of the car, leadership issue, lack of alternative and inadequate enforcement platforms. While presenting some statistical data on cycling crashes in Nigeria, the presenter stated that these were minimal at 0.42% and 0.45% of total Road Traffic Crashes (RTC) respectively for 2013 and 2014.

For motorized transportation modes, the paper highlighted some of the consequences to include: loss of man-hours in traffic, overstretched security/safety agencies, reduced family income, loss in national energy consumption and several health implications. In addition, an analysis of global fatalities from motorized transportation showed 1.24 million deaths and 50 million injuries annually. Futhermore the presenter emphasized that the lack of physical exercise is responsible for 2 million deaths annually; thereby providing justification for the promotion and use of non-motorized transportation.

The presenter however highlighted some key factors that are necessary for successful non-motorized transportation to include: Evolving effective Urban planning and infrastructure policies; placement of restrictions on vehicle importation and registration as well as addressing urban speeding. It concluded with a call for change in perception and cultural reorientation by emphasizing that cycling is not just for the poor; and recommended that:

- Government at all levels should allocate 25% of road and transport budget to non-motorized transportation
- The design/redesign of urban roads should be complete street where the needs of all modes of transportation are catered for.
- Stakeholders should build synergetic strategies for implementation of the national cycling policy and strategy
- The public should embrace transportation cycling and build coalition to demand for it, including making it the focal point of transportation in schools in Nigeria.
- Cycling should be included in the new national development plan with policies for local production and sale of bicycle at subsidized rates to the public.

EVALUATION OF IRON SLAG AS AGGREGATE IN ROAD PAVEMENT

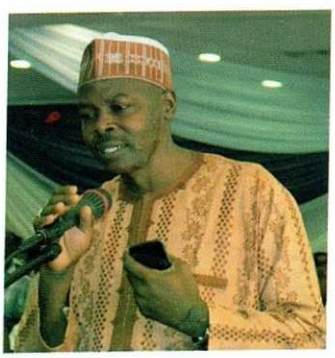
Kadiri Z.O., Avre G.K., Oki G and Nden, T. Nigerian Building and Road Research Institute (NBRRI)

The presenter stated that millions of tonnes of iron slag produced in Nigeria yearly are discarded as wastes in landfills. It opined that this waste material can be channelled into better use for cost-effective road construction comparable to conventional road base materials or coarse aggregates. It emphasized that the unique characteristics of iron slag can be put into effective use for construction purposes as a road base course material and as a coarse aggregate in concrete production. It noted that Iron slag has high load bearing capacity and increased strength over long periods of time; and its high chemical durability makes it suitable for large civil engineering works without undergoing any form of deformation.

Samples of iron slag obtained from Federated Steel Ltd Ota, Ogun state were subjected to laboratory tests at the National Laboratory Complex of NBRRI Ota, Ogun State. The paper further reported that the tests conducted included Aggregate Impact Value Test, Compressive Strength Test, Slump Test, Aggregate Abrasion Value Test. From the results obtained, it was mentioned that an aggregate impact value of 21.25% was obtained which indicated that iron slag aggregate has good resistance to sudden impact load and therefore suitable as road base course material. Also, the compressive strength test results showed that iron slag, as an aggregate, has the required compressive strength for concrete in road construction works. It was reported that 100mm cubes were used to carry out the tests with concrete mix of 1:3:6 (<20mm aggregate of iron slag) and w/c of 0.4; with compaction done by hand and cured in clean pure water for 7, 14, and 28 days. The compressive strength test results for 7 days curing was 27.56N/mm^2, 14 days was 32.74N/mm^2 and 28 days was 42.66N/mm^2 while a true slump of 64mm was obtained, demonstrating that iron slag has good workability and can be used as coarse aggregates for concrete works. Furthermore, the result from the Aggregate abrasion value test (Los Angeles test) showed that iron slag has an abrasion value of 18% indicating high resistance to wear and can therefore be used for road and pavement construction.

EVALUATION OF THE NIGERIAN BASE BITUMEN MODIFIED WITH AN ADDITIVE

Suleiman A. Y (ATBU, Bauchi), Hashim M. A (BUK)



The paper stated that bitumen penetration (PEN) 60/70 grade sourced locally or imported is commonly used to construct Asphalt pavements in Nigeria. The process which is tedious and hazardous, involves the heating of bitumen (binder) at very high mixing temperature of about 170°C resulting in the release of noxious gases (pollutants). Bitumen is a thermo-visco-elastic material whose temperature and rate of load application have a great influence on their performance. Generally, the paper noted that neat binders lack the proper viscous-elastic balance required in Asphalt mixture. Thus the paper presents the results of a study conducted to investigate the characteristics of bitumen PEN 60/70 modified with a commercial additive sasobit wax, a long chain aliphatic hydrocarbon (LCAH). It was emphasized that the use of the additive was intended to lower the mixing temperature thereby reducing the emission levels. Characteristically, the paper mentioned that the sasobit wax used as an additive to enhance the bitumen performance, is a compound with high molecular weight; and according to the paper, the study investigated the fundamental rheological and mechanical properties of the binder including the penetration test, softening point test, viscosity test, the rolling thin film oven test (RTFOT), and pressure age vessel (PAV). The results as presented in the paper show that with an increase in addition of Sasobit wax, the binder viscosity decreases at high temperature as it stiffens and becomes hard at low temperature, thereby increasing the softening point and reducing the penetration of the binder.

MITIGATING THE URBAN HEAT ISLAND EFFECT: A STUDY ON PAVEMENT MATERIALS IN THE TROPICS

Didel M.J., Danjuma G.A., Kishak C.Z and Maton D.J
Nigerian Building and Road Research Institute (NBRRI)

The paper observed that construction of pavements for pedestrian and vehicular transportation causes significant quantities of natural vegetation to be replaced by low albedo (Solar Absorptive) materials which increase the Urban Heat Island (UHI) effects. While stating that pavements are categorized as porous and impermeable, the paper also mentioned that solar radiation is known to be one of the most prominent heat sources in the environment, interacting with the surface reflectance of the pavements and with considerable heat stored in the pavement materials. It argued that the outdoor thermal environment is most influenced by the surface temperature of pavements which in turn increases the overall air temperature as well as the surface temperatures of adjourning walls, thereby transferring the heat (temperature) to the interior, and impacting on the operational indoor temperatures. This paper presented a study on three pavement materials surfaces and investigated the thermal heat gains of some pavement materials especially, their surface temperature under continual exposure to solar radiation. The findings as indicated in the paper showed excessive heat gain by paved surfaces especially during the day. Furthermore, the surface temperatures of the three pavements sampled were mostly elevated during the day for both porous and impermeable pavements, while Asphalt was observed to be the hottest material with an average surface temperature of 58.28°C. The surface temperature of Interlocking concrete tiles was next with 44.14°C and clay bricks were the coolest materials at 39.87°C. Cool pavements according to the study, which are porous with high solar reflectance (Interlocking Concrete tiles and Clay tiles), recorded significantly lower surface temperatures than the conventional impermeable pavements. The study therefore showed that an improvement on the thermal properties of pavements can be expected if the solar reflectance of paved surfaces is increased by retrofitting and with the adoption of porous pavement as a key feature of the urban fabric.

PROMOTING COLD PATCH ROAD MAT TECHNOLOGY FOR STRATEGIC, SAFE AND EFFICIENT MAINTENANCE OF FLEXIBLE PAVEMENTS ON SMALL SCALE IN NIGERIA

Adebayo, F. F. and Jimoh Y. A. University of Ilorin

In Nigeria and most developing countries, the current trend in road repairs as a maintenance practice is through the use of hot mix asphalt. However, this according to the paper is uneconomical, ineffective and inefficient for small street repairs due to constraints of weather and/or haulage distance to the repair points from asphalt production yard, because of temperature and low quantities. The use of Cold Patch Road Mat (CPRM) technology has a great potential to be a better alternative due to its inexpensiveness when patching a few numbers of potholes needing the small quantity of hot asphalt mixes. This paper therefore attempted to arouse the interest of different stakeholders on the use of bitumen extracted from the Nigerian tar sand and other locally sourced materials for the production of CPRMs. The paper discussed the different types of cold patch, their origin and characteristics, production techniques and laying procedure for pothole repairs; and also highlighted field performance evaluation under the Nigerian traffic and the environment/climatic conditions being conducted for Nigerian road mats in order to generate relevant technical data for CPRM technology. The paper further discussed and established the potential of cold patch road mat as an effective, safe, efficient and environmentally friendly remedy for small scale patching of potholes against the hot mix asphalt; and consequently recommended CPRM technology for use in small scale patching of potholes by individuals and relevant agencies.

MODELING THE RESILIENT MODULUS OF ROAD SOILS FOR EFFICIENT AND SUSTAINABLE TRANSPORTATION IN NIGERIA

Jimoh, Y. A. and Oyewo, S. T. University of Ilorin

The paper noted that incorporating faulty steps at design stage of road facilities especially in soils and materials characterization greatly impacts on the inability of road transportation systems in meeting up with its desired objectives. The aim of the paper therefore was to develop appropriate soil resilient modulus models for design of pavements in order to ensure efficient, sustainable and effective development of road transportation in Nigeria without the actual conduct of conventional tests. The objectives as enumerated in the paper included:

a) The determination of the suitability of some burrowed soils for road development in Ilorin, Kwara State of Nigeria
b) The characterization of the resilient modulus of the soils using non-destructive dynamic elastic property.
c) Development of the resilient modulus values of the soils at various moisture contents, dry densities and suction levels and;
d) The development of statistical models for estimation of realistic resilient modulus properties of a soil with respect to the three soil parameters.

The paper further highlighted the test standards used to include the BS 1377, 2000 for geotechnical evaluation of soils, the ASTM – 92 for suction property of unsaturated soil and the pundit for ultrasonic pulse velocity measurement; and further noted that the key parameters determined were the resilient modulus (MR), young modulus of elasticity (E), shear modulus (G), mass density of the soil specimen (e), the compressive transit velocity through the specimen (VP) and the poisson's ratio (v). Consequent on this, the resilient modulus model with moisture conditions, dry density, suction, normalized moisture, relative compactions were developed. The paper concluded that the resilient modulus of a road soil, as structural layer, is significant for stress–strain analysis of a flexible pavement and is dependent on prevailing moisture, density and compaction characteristics; and noted that the dynamic Elastic Modulus of a road soil can be determined with the measurement of the ultrasonic pulse velocity which is a non–destructive approach, and interpolated into statistical models for resilient modulus determination at prevailing moistures and dry densities using coefficient of correlation of $R^2 \geq 85\%$ on linear, 2nd and more degrees of polynomials with the normalized values.

WARM MIX ASPHALT TECHNOLOGY: A POTENTIAL FOR SUSTAINABLE ROAD TRANSPORTATION IN NIGERIA

Jimoh Y.A and Afolabi A.A University of Ilorin

The paper reviewed the potentials and applications of Warm Mix Asphalt (WMA) technology over hot mix asphalt in achieving sustainable (safe and green) road construction vis-a-vis its advantages of energy conservation, pollutants emissions reduction and environmental friendliness. It further reviewed the advantages and potentials of bio-oils and crumb rubber produced from readily available recycled corn stover and scrap tire respectively as a way to improve performance of asphalt at lower temperatures; as well as the attendant work men's health and comfort. The alternative uses of wastes largely generated from agrarian practice and hydrocarbons in Nigeria for the Warm Mix Asphalt were assessed; and it was noted that it could also constitute achievable significant vectors of the Millennium Development Goals that would ensure the effective utilization of bio-oil and the crumb rubber to partially satisfy the 30% minimum waste recycle policy initiative. The paper highlighted the need for researchers to take steps in filling the critical gap existing in producing sustainable green asphalt pavement and strongly advocated the adoption and use of WMA for a developing country like Nigeria.

DEVELOPMENT OF A FRAMEWORK FOR MONITORING COMMUNITY-BASED RURAL ROADS MAINTENANCE CONTRACTING

Olowosulu, A. T., Joel, M. and Abdulmuni, S. Ahmadu Bello University (ABU, Zaria)

Olowosulu, A. T

The desire to maintain and preserve public roads in an effective and efficient manner gave rise to new contracting initiatives amongst which is the community-based maintenance contracting. This initiative utilizes labour from the communities around the road corridor and payment is made on proper completion of work agreed upon for a certain period and not on time spent on the work. Since community-based maintenance is relatively new, availability of reliable and comprehensive set of methodology and procedure to evaluate and monitor work is relatively limited, thus performance standards are still more oriented towards work procedures and materials used rather than on results. Consequent on this, the paper presented an overview of a proposed framework that can be used to assess accruable benefits from using community-based initiatives on road maintenance as against the traditional contracting. The framework considered the assessment of three main areas -- services quality, measure of effectiveness and provision of efficiency; and advocated its adoption for achieving greater effectiveness in rural roads maintenance initiatives.

APPROPRIATE TECHNOLOGY FOR THE DESIGN AND CONSTRUCTION OF RURAL ACCESS ROAD: A CASE STUDY OF IYA OJE-AKA AND IDI OSE-ITEMU RURAL ROADS, OYO STATE

Francis O. Aitsebaomo
Nigerian Building and Road Research Institute (NBRRI)

Francis O. Aitsebaomo

The paper identified the major factors which impair rural development and accentuate rural poverty to include the absence of or inadequate infrastructure. Generally, the dearth of quality access roads in rural areas negatively impacts on the development and growth of the health, education, agriculture among other sectors of the economy. To address this dearth, the presenter stated that the Nigerian Building and Road Research Institute considered the application of labour based/light equipment supported technology for the construction and maintenance of rural access roads. The paper further stated that Labour-based technology implies the use of labour; hand tools such as spades, diggers, wheelbarrows, etc.; and compatible light equipment such as Pedestrian Roller Compactor, for construction, rehabilitation and maintenance works. The paper presented the application and demonstration of this technology in the construction of Iya Oje –Aka and Idi Ose –Itemu rural roads, spanning 12.5 km in the Surulere Local Government Area of Oyo State. This according to the paper involved the administration of five hundred questionnaires in Iya Oje, Aka, Idi Ose, Itemu and their environs for the base line studies that provided information on the basic economic potentials and activities of the communities, the level of growth and its limitations. The group interviewed included men and women within the ages of 18-75 years. The questionnaire was structured to cover technical feasibility, economic justification and social criteria. The paper furthermore discussed the basic steps involved in the access road construction as well as the derivable benefits. The paper concluded that while maintaining high quality comparable with equipment based method, 75% of the project cost that would have been expended on heavy equipment without direct benefits to the benefiting communities was expended on labour force; and advocated for the adoption of the technology as a veritable tool for the construction of quality rural roads to enhance accelerated rural infrastructural development.

ASSESSMENT OF FACTORS INHIBITING EFFICIENT INTEGRATED RURAL ROAD TRANSPORT IN KWARA STATE, NIGERIA

Ibrahim, T. Y. & Yinusa A.J. University of Ilorin

The paper identified rural transport and infrastructure as topical and crucial components for economic development of any nation. It further enumerated the effect of various concomitant inhibiting factors, with a view to recommend strategies for correcting identified anomalies and ensure sustainable development. In assessing the factors inhibiting efficient rural transport in Kwara State, the paper reported the administration of 3,000 questionnaires in ten randomly selected communities from three Local Government Areas (LGAs) in Kwara State with focus on the primary rural stakeholders. The data collected, according to the paper, included information on existing rural motorized transport accessibility, road network connectivity/density, patrons' occupation and personal attributes as well as effective rural movement hindrances and the causes of the hindrances. Statistical analysis of the generated data revealed significant results which included: an inequality in the provision of road infrastructure as well as maintenance and rehabilitation of the roads; climate and unfavorable weather conditions which inhibited efficient rural road transport that has resulted in disparities in the level of rural development; the poor condition of the roads has negative effects on agricultural activities, which is the major source of income of rural stakeholders that included farmers, traders and teachers; the distance of the local government from the state headquarters has significant impact on the level of road accessibility, road network connectivity and the quality of rural transport services; etc. Based on the results, the paper recommended an integrated rural development strategy which advocates a public empowerment scheme for the rural dwellers to ensure the development, maintenance and operation of road links for all season motorized movements.

AN AGENDA FOR NETWORKING ROAD TRANSPORT RESEARCH IN NIGERIA

Matawal, D. S. and Omange, G.N.
Nigerian Building and Road Research Institute (NBRRI)

Omange, G.N.

The paper noted that Road transportation is the most popular mode of mobility of people, goods and services in Nigeria accounting for over 90% of its haulage profile; and contributing effectively to the nation's socio-economic development. The resultant overstressed roads coupled with prevailing challenges of delayed maintenance, etc. have attracted series of government interventions as well as institutional frameworks to constantly address them. The institutional frameworks consisting of organizations like the Nigerian Building and Road Research Institute (NBRRI), the Nigerian Institute of Transport Technology (NITT), the Federal Road Safety Commission (FRSC), etc. have their mandates partially or wholly dedicated to conducting Road and Road Transport research activities. While significant achievements have been made by these organizations, their optimum impact have not been as effective primarily because of the observed limitations or lack of cooperation and networking of their activities, programmes and output geared towards more effective service delivery. This paper therefore provided a review of accruable benefits from such national networking of Road and Road Transport Research-related organizations by presenting case studies of regional bodies such as the Association of South African National Road Agencies (ASANRA), the Forum of European National Highway Research Laboratories (FEHRL), and the recently established African Road Transport Research Forum (ARTReF). The Paper also reviewed the profiles of some of the Agencies in Nigeria that partially or wholly conduct Road and Road Transport research activities and highlighted the need for these establishments to network their activities, programmes and output for more effective service delivery to the sector and the socio-economic development of the nation. Further to the above, the paper proposed a framework for setting up of a formidable *National Road Transport Research Forum* (NARTReF) to network these establishments locally and globally.

Birthday

NAME	DEPT.	DATE OF BIRTH
A.M Fakeye	RRD	1st April
Okoliko Arome S.	A/F	5th April
Yakub Ahmed	BRD	8th April
Adebola Abiodun	A/F	9th April
Jombo P.N	A/F	10th April
Falayi C.	A/F	12th April
Avre Kazzi Gaius	BRD	14th April
Onunaku E.E	A/F	15th April
Diji Nduka J.	A/F	16th April
Etuk E.A	RRD	18th April
Bobzum B.G	RRD	19th April
Edom Atomen	BRD	24th April
Okpebho Enobakhale	A/F	24th April
Ameh J.S	EMRD	25th April
Olorunfemi A.C	A/F	26th April
Sosanolu Omoniyi	RRD	26th April
Chimezie Onyema	A/F	2nd May
Ogwu Ekele	EMRD	3rd May
Okonufua Endurance	RRD	5th May
Ugonna M.C	BRD	5th May
Sanni Jeremiah	BRD	6th May
Akanbi Dayo O.	RRD	7th May
Dokunmu A.M	PITD	8th May
Imonikosaye R	BRD	9th May
Ojo F.A	RRD	10th May
Ibe Kingsley	BRD	11th May
Ologun S.	RRD	12th May
Taofiq Bello	BRD	12th May
Engr. F.I Apeh	EMRD	13th May
Lamidi Rashidat B.	RRD	14th May
Dada Kazeem	RRD	14th May
Ali O.J	A/F	19th May
Babatunde A.O	DG/CEO	22nd May
Ademosu B.	PITD	25th May
Achema Felix	EMRD	28th May
Chukwura Chris N.	PITD	30th May
Essng Nya	BRD	1st June
Ladipo T. Oluwatosin	RRD	8th June
Oshodi O.R	BRD	12th June
Atiku Sabitu Dabai	BRD	10th June
Mahmoud L.U	EMRD	11th June
Umar Enejo Yusuf	EMRD	13th June
Agbonkhese O.	RRD	14th June
Enenche Agbo U	A/F	16th June
Yashi Jennifer	RRD	16th June
Fiyebo Samson A.B	EMRD	17th June
Fabiyi Mustapha O.	EMRD	18th June
Aboluwarin O.	RRD	18th June
Ibhadode Osagie	BRD	19th June
Salami Samshudeen	BRD	20th June
Akande Cecelia N.	A/F	20th June
Idowu Rasheedat R	DG/CEO	29th June

Wedding

Felix Efeizomor of the Maintenance Unit, Ota got married to Miss Sola Erikpara on 6th April, 2015 in Owa, Delta State.

Mr. Mabweh Maryom Ishaya of Admin and Finance Dept. Jos Zonal Office Married Miss Dorothy Simon Masok Mashakash on 14th March 2015 in Bokkos Plateau State

Births

Mr. and Rev. (Mrs) Okon E. Effiong of Admin and Finance Dept. gave birth to Master Victor Okon Effiong on 1st May 2015

SENATOR BOROFFICE VISITS NBRRI

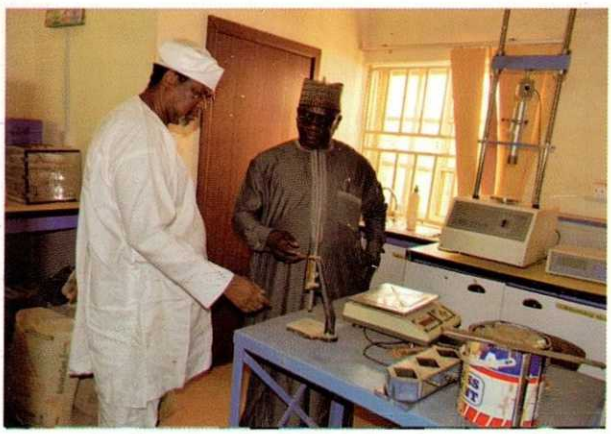
Reception of Senator Boroffice at NBRRI Conference Room during his visit to NBRRI Administrative Headquarters in Abuja

The Senate Committee Chairman on Science and Technology in the 7th Assembly, Senator Robert Ajayi Boroffice paid a visit to NBRRI Administrative Headquarters in Jabi, Abuja on 29th April 2015. The visit is part of the oversight functions of the Committee on agencies under its purview. Senator Boroffice was accompanied by his senior adviser Barrister Adekunle Ajanaku and the clerk of the Committee, Alhaji Musa Abdullahi to the Institute. The Senator was welcomed to the Institute by the DG/CEO Prof. Danladi Matawal and thereafter met with the management staff of the Institute at the Conference room.

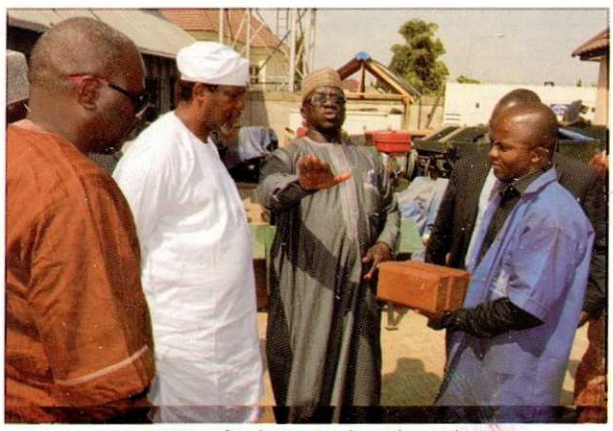
Speaking at the meeting, Prof Matawal welcomed the Senator and also congratulated him on his victory in the recent election polls. He disclosed to the august visitor the various achievements recorded by NBRRI in the past years and future goals of the Institute. Prof Matawal also gave updates on the revised NBRRI Act, stating that it has been deliberated upon and approved by the Federal Executive Council; and will soon be sent to the National Assembly. Prof. Matawal further stressed on efforts on commercialization of the Institute's Technological Innovations, noting that more jobs will be created through it. He added that the Institute also plans to partner with some State Governments.

Responding, Senator Boroffice thanked the DG/CEO and staff for the warm reception and appreciated the good works of the institute. He added that NBRRI is one of the most important Parastatals under the Ministry of Science and Technology and one of the oldest research Institutes in the country, and that the Institute is doing great things. Senator Boroffice prayed he remains a member of the Science and Technology Committee in the next Assembly so as to help push the Institute's interest to greater heights.

The Senator was later conducted round the facilities of the Institute's office complex



Senator (Prof.) Borofice, the Chairman of the Senate Committee on Science and Technology accompanied by Prof. Matawal, DG, NBRRI; inspecting the Materials Testing Laboratory during his visit to NBRRI Administrative Headquarters in Abuja



Senator Borrofice being conducted round NBRRI Display facilities at NBRRI Administrative Headquarters