Movin' On 2018 Montreal, Canada. World Summit on Sustainable Mobility

30 May -1 June, 2018

Sustainable Mobility Efforts in Nigeria

Boboye O. Oyeyemi, Ph.D.

MFR,mni,NPoM,FNIM,FCIPM,FCILT

Corps Marshal- Federal Road Safety Corps,

Nigeria





Preamble

- Around the planet there is growing awareness of transportation's implication in atmospheric pollution and Green House Gas (GHG) accumulation
- There is also growing concern about the various social and environmental problems associated with the globalization of commerce



URBAN TRANSPORT CHALLENGES



No regulatory public transport framework – with the poor often vulnerable to high cost of transportation

CONTEMPORARY ISSUES FUELLING SUSTAINABLE TRANSPORTATION

 How best to contain or interrupt growth, and promote improvement and use of transit, walking, cycling and railways

How best to curtail transportation emissions

While the world is rapidly moving towards cleaner fuel, obsolete and outdated vehicle technologies continue to be shipped to developing countries through second-hand vehicle market. Thanks to regulatory loopholes, old vehicles make their way into developing and transitional markets, mainly in Africa, undermining the gains made in other areas of intervention, including air quality and fuel quality. In absence of any regional or global agreements to govern the flow of used vehicles, the continent is now getting flooded with polluting vehicles which are sometimes more than 10 years old. Only 10 countries in the continent ban used vehicles over 5 years. Regulations are weaker in 24 countries, including Ethiopia, Somalia, South Sudan., Benin and Democratic Republic of Congo, where government ban only those vehicles that are 10 years and over

Data Source: Africa used vehicle report, UNEP, March 2018

 How to break out of conventional approaches to transportation planning in order to attain sustainability

VIEW OF TRANSPORTATION IN NIGERIA COMMERCIAL CITIES



PM 2.5 levels in Nigerian cities: WHO, 2016 AS REPORTED BY CSE

PM 2.5 levels in 12 cities of Nigeria

•Little Green Data Book 2016 by the World Bank: 100% of Nigerian population is exposed to PM2.5 levels that exceed WHO guidelines.



PM 10 levels in Nigerian cities: WHO, 2016 AS REPORTED BY CSE

140 120 100 80 60 40 WHO Standard 20 -0 Kano Sokoto Maidueuri Bauchi Kaduna 105 Minna Yola lorin Abuia Lokoia Incity Enuen Ibadan Marri 13805

PM 10 in 16 cities of Nigeria

Source: Federal Ministry of Environment, Nigeria

AIR QUALITY MONITORING IN NIGERIA

•Air quality monitoring in Abuja by **3** agencies.

•FME's automatic monitoring station at International conference Centre monitors CO and SO2 levels.

•Automatic station of the Meteorological agency monitors SO2, NOx, CO and PM10 levels.

•NESREA has mobile air quality monitoring.

•Power supply is a major constraint



MULTIMODAL MOBILITY IN NIGERIA

Mass transit operation in Nigeria have included mostly (a) buses which offer inter and intra city services (b) rail that run in and across few states (c) air transport in the urban areas which is somewhat limited to the few who can afford such means of transportation and (d) canoes and speed boats which cater mostly for people in coastal communities.



MULTIMODAL MOBILITY IN NIGERIA

Mass transit operations in Nigeria also include the freighting of goods within and across the borders of the country including to neighbouring countries in the ECOWAS sub-region. The means of such haulages have included ships for conveying cargoes including petroleum products.



According to National Automotive Design & Development Council, Nigeria

One of the best ways to clean a petrol engine emission is through a three-way catalytic converter. It performs three simultaneous tasks:

- Reduction of nitrogen oxides to nitrogen and oxygen:
- Oxidation of carbon monoxide to carbon dioxide:
- Oxidation of unburnt non-methane hydrocarbons (HC) to carbon dioxide and water

These reactions works better with low Sulphur fuel, at least 50ppm, preferably 10ppm and below. Unleaded petrol is also required as Lead will poison the catalyst.



Clean Diesel Technology

- Clean diesel technology is the use a number of exhaust after treatment options such as:
 - Diesel particulate filters (DPF),
 - Diesel oxidation catalysts (DOC),
 - Exhaust gas recirculation (EGR), and
 - Selective catalyst reduction (SCR) with the use of diesel exhaust fluid (DEF)

These however, require low Sulphur (S) fuels. DOC requires 500 ppm S and below, while DPF requires 50 ppm S and below. Introduction of ultra-low sulfur diesel fuels for both on- and off-road applications is a central part of the clean diesel system designed to meet near zero emissions standards. DOC are similar to petrol engine catalytic converters.

Diesel Particulate Filters

Diesel particulate filters usually remove 85% to 100% of the soot. Some filters are single-use, intended for disposal and replacement once full of accumulated ash. Others are designed to burn off the accumulated particulate either passively through the use of a catalyst or by active means such as a fuel burner which heats the filter to burn the soot.

Particulate matter reductions

Particulate matter (PM10) emissions fell 96% from Euro-1 to Euro-6, and are today equivalent to one grain of sand per km driven



Source: National Automotive Design & Development Council, Nigeria

SCR Technology

Selective Catalytic Reduction (SCR) is an advanced active emissions control technology system that injects a liquid-reducing agent through a special catalyst into the exhaust stream of a diesel engine. The reducing source is usually automotive-grade urea, otherwise known as Diesel Exhaust Fluid (DEF).

SCR Technology

Selective Catalytic Reduction (SCR) is an advanced active emissions control technology system that injects a liquid-reducing agent through a special catalyst into the exhaust stream of a diesel engine. The reducing source is usually automotive-grade urea, otherwise known as Diesel Exhaust Fluid (DEF).

Nigeria Actions - Priority area - Road safety:

- Implement the UN Decade of Action for Road Safety 2011-2020 to half the road fatality and came up with the Nigerian Road Safety Strategy 2014-2018 using the 5 pillars of action
- Robust public enlightenment campaign against vehicles with excessive smoke emission as vehicular emission accounts for about 50% of Nigerian CO₂ emissions annually and also cause poor visibility for drivers causing road crashes on the highway. Step up Enforcement of Traffic Laws against vehicles with excessive smoke emission.
- Discourage the use of burning tyres at night instead of Caution Signs even when they have the Caution sign. Apart from emission problem the burnt tyres damage the road surface which eventually lead to portholes/black-spots on the highways.

- Traffic Control to enable free flow of traffic as traffic congestion usually lead to more emission within the traffic congested area
- FRSC got ISO 9001 certified and collaborated with the Standard Organisation of Nigeria (SON) to adopt and domesticate the ISO 39001 on Road traffic Management which aligns to 5 pillars of Decade of Action on road safety.
- FRSC keyed into the UN Sustainable Development Goals (SDG) 2015 2030 Implement the Goals 3& 11 and by extension 13
- Currently FRSC is collaborating with FCTA on the re-design of bicycle lanes in Abuja metropolis as pilot.
- Collaborated with other stakeholders and develop a Non-Motorised Transport Policy for the country.
- Sponsored a memo to National Council on Works and got the approval for the introduction of cycling infrastructure in major towns to encourage non-motorized transport

- Nigerian government investment is focused on inter-modal transport infrastructure in order to build a strong, sound and viable economic environment.
- Nigeria largest city Lagos is constructing a light rail system under Public Private Partnership. The project is sponsored by Lagos State Government and to be developed by LAMATA on behalf of Lagos State Government.
- The Federal Capital Territory has also planned light rail mass transit line; so also has Rivers, Kaduna and Kano States planned for their major cities. The hallmark of light rail system is to adequately serve the high density of communities in the major cities. Unlike buses or trams, light rail is high capacity public transport.



 One of the solutions to accelerate the change is to carry along other countries in the sub-region in view of conflicting policy on vehicle standards / importation, weak borders and smuggling. ECOWAS observed these problems in 2015 and developed the Automotive Industrial Policy Framework in West Africa sponsored by African Development Bank

• Building active partnership with the private sector, so that government can withdraw from routine management of transport- related businesses and instead, commit itself to the provision of adequate regulatory framework for coordinating the sector.

MOVING INTO CIRCULAR ECONOMY

According to Ellen MacArthur Foundation, "A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste. through the superior design of materials, products, systems, and, within this, business models".

our industrial economy has hardly moved beyond one fundamental characteristic established in the early days of industrialization: a linear model of resource consumption that follows a 'take-make- dispose' pattern. Companies harvest and extract materials, use them to manufacture a product, and sell the product to a consumer— who then discards it when it no longer serves its purpose.

Underpinned by a transition to renewable energy sources, the circular model builds economic, natural and social capital.

Moving on, we must base the new business models on circular economy, and quickly. We must turn to additive manufacturing, also known as "3D printing", and develop a collaborative ecosystem where innovative startups and leaders of the public and private sectors work hand in hand.

MOVING INTO CIRCULAR ECONOMY



Source: 1st CoMaaS conference, Tampere 28.-29.11.2017

MOVING INTO CIRCULAR ECONOMY



In just a few decades, drones, vacuum tube transport (Hyperloop-style), electric and solar planes and reusable rockets could completely transform the way we travel.

These mobility moonshots will have a significant impact on existing infrastructure. We must develop the roads, cities and charging stations and other infrastructure required to propel the transportation of the future.

Federal Road Safety Corps in Nigeria in line with the global trend is reviewing the Nigerian Road Safety Strategy which is anchored on the UN Decade of Action to accommodate the advent of electric and solar based vehicles on Nigerian road.

Such strategies also enhance the discharge of Nigerian responsibilities in her commitment to the Paris Climate Agreement.

Electric and solar-based vehicles are one of the solutions for the future because of no carbon emission and Nigerian is making efforts towards that direction in her future medium and long time goals

It is in this regard that the Federal Ministry of Environment, Nigeria in conjunction with National Automotive Design and Development Council in Nigeria held a 2-day stakeholders workshop on "Clean Fuels and Clean Vehicles in Nigeria" from $24^{TH} - 25^{TH}$ APRIL, 2018.



THANK YOU

Phone Only



Call toll free on: 122 0700 - CALL - FRSC 0700 - 2255 - 3772





080 7769 0362

www.frsc.gov.ng