A CRITICAL APPRAISAL OF ROAD TRANSPORT INFRASTRUCTURE MANAGEMENT IN NIGERIA

Alaba Adetola, Jack Goulding and Champika Liyanage

School of Built and Natural Environment, University of Central Lancashire, Preston, PR1 2HE, UK

E-mail: aeadetola@uclan.ac.uk

In contemporary human society, transportation is crucial to the economic life of every nation. Road transport happens to be the most common mode of transportation in Nigeria, and accounts for about 90% of the movement of persons, farm produce, merchandise, animals and mobile services such as clinics, libraries and banks. Most of the federal highways in Nigeria were procured decades ago by the traditional contracting system. A good number of the road-networks in many Nigerian cities are unpaved, poorly maintained, overused and impassable, thereby cutting off many rural areas from larger settlements during the rainy season, which has a corresponding negative impact on the cost of production. This paper critically reviews the management of road transport infrastructure in Nigeria, a nation with about 140 million people. It identifies six key issues that hinder or do not allow the active involvement of the private sector in road transport infrastructure delivery. These issues include: inadequate maintenance, misuse of roads, over dependence on roads, poor inter-modal transport systems, institutional issues, and inadequate funding. It is therefore positioned that, in order to provide high quality, cost-effective, all-weather, safe, reliable and environmentally sensitive road transport infrastructure of world-class status (underpinned by 'value for money' drivers), there is a need for an adequate, enforceable and enabling legal/ regulatory collaborative engagement framework for road transport infrastructure management in Nigeria.

Keywords: highway, infrastructure, maintenance, public-private partnerships, road transport.

INTRODUCTION

Transport is often a means of conveying people, goods and services from one place to another, and across several communities through road, rail, air, water, tunnel and pipeline. Transportation plays a crucial role in shaping the destiny of many nations because modern industry and commercial activities seem to rest on appropriate, well developed and efficient transport system. It

performs a critical role by allowing raw materials to be moved from farm to factory, and finished goods from factory to market, thereby enabling products to be made available at locations desired by the consumers (Potter and Lalwani, 2008). Other activities which require the movement of people include farming, agriculture, education, recreation and social contacts, employment opportunities, health services, economic activities, general development of the community, and maintenance of law and order. Emergency services rendered by most agencies also depend on street and highway system for optimal efficiency (Brockenbrough and Boedecker, 2009). Thus, the extent to which a nation's land mass is covered by road network is often an index of the degree of mobility of people, goods and services within the country, and the quality of the network measures the ease and cost of that mobility (Adesanya, 1998).

A road can be described as a thoroughfare, route, or way between two places, which typically has been improved to allow travel by some conveyance, including a horse, cart or motorised vehicle. Traditional roads were simply recognisable routes without any formal construction or maintenance while modern roads are normally smoothed, paved, or otherwise prepared to allow easy travel on land via carriageway. Road transport has trip origin and destination through terminals where passengers can embark, or where goods and services can be loaded or off-loaded in urban areas (Kendrick et al, 2004).

Road transportation has been the most popular means of movement in Nigeria, a country with an area of 923,768.64 km^2, population of about 140 million comprising 11 cities with population above one million and 23 cities with population of over 200,000 (Federal Government of Nigeria, FGN 2010). It accounts for about 90% of all inter and intra city movements of persons, farm produce, merchandise, animals and mobile services such as clinics, libraries and banks across the country (Akpogomeh, 2002). The optional use of motor cars for pleasure tend to contribute tremendously to the importance of road transport in Nigeria given the deteriorated state of alternative modes of transportation (rail system, inland waterways) and also the psychological satisfaction offered by the possession of a car (Adesanya, 1998). The major cities, including the 36 state capitals and the Federal capital are connected to each other by a network of highways. The road network in the South-Western and South-Eastern Nigeria seem to be much denser than others in the rest of the country due to higher population densities (Ubogu et al, 2011).

Nigeria appears to have the largest road network in West Africa and the second largest South of Sahara. The current national network of roads is

estimated at about 196,000 kilometres with the Federal roads network carrying about 70% of freight in Nigeria (Oni and Okanlawon, 2006). Details of the distribution are given in Table 1.

Table 1: Distribution of the National Road Network in Nigeria

Type of Pavement	Federal (Km)	State (Km)	Local Government (Km)	Total (Km)	Percentage
Paved Trunk Roads.	28,741	10,400	_____	39,141	20%
Unpaved Trunk Roads.	05,600	20,100	_____	25,700	13%
Urban Roads.	_____	_____	21,900	21,900	11%
Main Rural Roads.	_____	_____	72,800	72,800	37%
Village Access Roads.	_____	_____	35,900	35,900	19%
Total (Km).	34,341	30,500	130,600	195,441	100%
Percentage.	17%	16%	67%	100%	

Source: Oni and Okanlawon, 92006

Reports have it that the present condition of some of these roads require urgent attention in most parts of the country, thereby impacting negatively on the cost of production and representing a major trigger of cost-push inflation in Nigeria (Ubogu et al, 2011; Oni, 2008; Oni and Okanlawon, 2006). Transport appears critical to economic development, both in low volume/ rural roads and major arterials, since there seems to be a direct relationship between a country's economic prosperity and the length (kilometres) of paved roads (Queiroz and Gautam, 1992). This paper articulates the economic importance of road infrastructure, road classification in Nigeria, and the roles of various agencies responsible for road infrastructure management in Nigeria. Furthermore, it identifies a series of cogent problems and challenges that hinder the effective management of roads in Nigeria; and presents a number of initiatives as a potential way forward.

ECONOMIC IMPORTANCE OF ROAD INFRASTRUCTURE

Transport often plays a key role in the economic and social development of every nation. Land transport involves movement of people and goods on land from one location to another. In this respect, it appears to be the dominant form of transportation in the world and includes road, rail and pipeline. Heggie and Vickers (1998) described public road network as the largest public infrastructure asset. The predominance of road transport as the means of passenger and freight movements further underlines the economic

importance of roads. The value of road asset and cost implications of delayed maintenance to a nation's economy and the road user often underscore the invaluable role of maintenance. For example, in Sub-Saharan African countries, the costs of degraded road network to road users are often very high and consequently hinder national economic development potential. In other words, poor road condition often translates into higher vehicle operating costs and lengthier travel times (Brushett, 2005). In this regard, road network may be considered as an asset which often needs to be maintained and improved in order to ensure the best performance, value-for-money and the maximum service-life. Effective management enables the road network to withstand the damage caused by wear and tear, prevents substandard conditions from developing, and ensures the flow of traffic in a safe, efficient and reliable manner with little or no damage to the environment. Thus, well maintained road networks that provide the level of service needed by road users are often critical and important element of development (Transport Research Laboratory, 1998).

The users of effective highway facilities tend to benefit from enhanced ease of travel, safety and economy of time. The owners of abutting property also benefit from better access and increased property value. Good highway system often makes for effective emergency service and better street parking. Concentration of people in urban areas might be greatly reduced, as an efficient transportation encourages the people to live in places away from their work centres. Thus, it may help in decreasing the growth of slums in urban area. Highway system may also have impact on the overall economy by lowering the cost of producing and distributing products which make up the economy and directly feeds the Gross National Product (GNP). Furthermore, it tends to generate employment since a considerable number of jobs may be highway related and expenditure on highway seems to form a big portion of the GNP (Queiroz and Gautam, 1992). The provision of highway probably makes easier the defence of a territory against aggression and the task of guarding the borders.

ROAD CLASSIFICATION IN NIGERIA

The important factors often considered in classification of roads seem to be the authority responsible for the roads, accessibility to the abutting property, location and functions of the road. In this respect, the Nigerian road system is classified into three broad categories.

Trunk 'A' Road

The trunk 'A' roads form the major network around which other categories of roads are built. They run through the length and breadth of the country, connect ports, capitals of various states and also provide international links with neighbouring countries. Notable examples are Lagos-Ibadan Expressway, Sagamu-Ijebu Ode-Benin Expressway, Abuja-Kaduna Expressway, Akure-Ilesa road, Lagos-Badagry-Republic of Benin road etc. This category of roads are constructed, managed and owned by the Federal Government. The distribution and length of the federal highway network in the six geo-political zones of Nigeria is shown in Table 2.

Trunk 'B' Road

The trunk 'B' roads are the highways within the states which connect important towns and cities of the states, connect the cities of the states to federal highways and serve as the main arteries of traffic to and fro the district roads. This category of roads are developed, maintained and owned by the component states.

Trunk 'C' Road

The trunk 'C' roads serve the interior rural population of the district and connect areas of production and market with state highways, major district roads and railways. This category of roads are under the ownership and management of the local government, hence they are commonly referred to as local government roads.

Table 2: Federal Highway Network in the Six Geo-Political Zones of Nigeria

Zone	States	Road Network (Km)
South-East	Anambra, Enugu, Imo, Ebonyi, Abia	3,121.70km
South-West	Lagos, Oyo, Osun, Ondo, Ekiti, Ogun	4,161.06km
South-South	Akwa Ibom, Delta, Cross River, Bayelsa, Rivers, Edo	4,150.89km
North-East	Adamawa, Bauchi, Borno, Gombe, Taraba, Yobe	6,787.90km
North-West	Kaduna, Jigawa, Kano, Katsina, Kebbi, Sokoto, Zamfara	6,363.40km
North-Central	Niger, Kwara, Plateau, Benue, Nasarawa, Kogi, Federal Capital Territory Abuja	9,756.00km
Total		34,340.95km

Source: Authors' Fieldwork, 2011

Each tier of government has the responsibility for planning, designing, construction, rehabilitation, operation and maintenance of the network of roads under its jurisdiction (Ubogu et al, 2011). In other words, federal roads are managed by the Federal Ministry of Works, state roads are managed by

the State Ministries of Works, while the local roads are managed by the Works Department of local government authorities (774) in Nigeria.

ROAD INFRASTRUCTURE MANAGEMENT IN NIGERIA

Road infrastructure management often covers the use, operation, maintenance and development through improvement or construction of new roads. It has been defined as the process of maintaining, improving and optimising the overall performance of the road network and all its elements (pavement, bridges, street lights, signs, drains, lines, street furniture, verges etc.) over time (Transport Research Laboratory, 1998). A highway is a general term which defines a conduit or public way provided for use of vehicular traffic including the entire area within the strip of land reserved by mutual consent or acquired by statutory regulations. A typical highway is constructed in such a way that will enable the operators of vehicles to have a clear view ahead of lines, curves, horizontal and vertical alignment that merged (O'Flaherty, 2007). Well-maintained roads are expected to be well lit especially to aid night-travel, hence, road lighting is put in place on roads to ensure the safe movements of both vehicles and pedestrians at all times (Slinn et al, 2005). Similarly, road surface often affects the stability of vehicles by the nature of the contact between the wheels and surface, and it further affects the driver in controlling his vehicle by the amount of irregularities present. Sudden bumps are known to cause loss of control if speeds are not adjusted to the road conditions (Kendrick et al, 2004). The quality of any work is often a factor of material, methodology used and competence of personnel or supervisor. In this regard, Arumala (1987) and Akpododje (1986) discovered little or no adherence to highway design standards, poor supervision by government officials, and lowering of the design specifications during construction as major factors responsible for road failure in Nigeria. Similarly, Ibrahim (1980) and Ola (1978) attributed road failure mainly to overloading, use of sub-standard construction materials, and inadequate knowledge of the geotechnical properties of the soils over which roads are built.

The administration of highway in Nigeria does not differ considerably from the standard practice. The Federal Ministry of Works, an agency designated to administer the highway programme of the Federal Government of Nigeria is responsible for managing all the road system that form the core of the national grid.

Federal Ministry of Works

The Federal Ministry of Works, (FMW) is charged with several statutory responsibilities among which are federal highways and bridges (planning,

design, construction and rehabilitation); supervision of the monitoring and maintenance of federal roads nationwide; provision of highway engineering infrastructure; and surveying and mapping of Nigeria's internal and international boundaries. The agency is presently structured into four operational departments namely: Highways (Planning and Design); Highways (Construction and Rehabilitation); Engineering Services; and Federal Surveys. Other service departments include Public Procurement; Human Resources; Planning, Research and Statistics; Legal Services; and Finance and Accounts.

The ministry also supervises the activities of the Federal Roads Maintenance Agency (FERMA); Federal School of Surveys, Oyo; and Regional Centre for Training in Aerospace Surveys, Ile-Ife. The ministry operates through its field headquarters located in the 36 states of Nigeria and the Federal Capital Territory, Abuja. The vision of the ministry is to elevate Nigerian roads to a standard where they become national economic and socio-political assets, contributing to her rapid growth and development. The agency intends to make federal roads functional, pleasurable and an avenue of re-inventing Nigerians' trust and confidence in government.

Federal Roads Maintenance Agency

Highway maintenance often has to do with preserving and keeping road structures as near as possible in their original state. It consists of correcting deficiencies that have developed as a result of age, use and the effects of the elements, and taking steps to prevent or delay the development of other deficiencies. Road maintenance is vital in order to prolong its life, just as well-maintained roads often reduce the cost of operating vehicles by providing good running surface. Proper maintenance also keeps the roads open and ensures greater regularity, punctuality and safety of transport services (Central Bank of Nigeria, 2003).

In 1995, Civil Engineering experts and concerned stakeholders including the Nigerian Society of Engineers (NSE), Council for the Regulation of Engineering in Nigeria (COREN), the organised private sector, experts from the Central Bank of Nigeria (CBN), experts from the World Bank and the International Road Federation, Nigerian Association of Road Transport Owners (NARTO) and the National Union of Road Transport Workers (NURTW), after hectic brainstorming sessions, came up with what is now known as the Road Vision 2020.The Vision advised government to de-link road-maintenance from planning, design, construction and rehabilitation, which are the traditional Federal Highways Department's role domiciled in the Federal Ministry of Works. Thus, the Federal Roads Maintenance

Agency, (FERMA) was established on 20th November 2002, with the enactment of the Establishment Act 2002 to monitor and maintain all federal roads in Nigeria. FERMA is an agency under the Federal Ministry of Transport, Nigeria, whose principal role is to carry out regular routine maintenance on the federal road network. The agency came into being as a 10-13 year stop gap pending the time a full-fledged reform is put in place to incorporate the Nigerian roads with a comprehensive infrastructure management system.

FERMA, along with the Highways Department of the Federal Ministry of Works are responsible for looking after the federal roads network. The Highway Department is charged with the construction of new highways, and the reconstruction and rehabilitation of badly damaged highways, while FERMA is responsible for maintaining the highways at acceptable levels of usability.

Road Traffic Administration and Safety Management

In 1976, there were 53,897 road traffic accidents resulting in 7,717 deaths in Nigeria. In the year 1981, the number of accident reduced to 35,114, but the fatality increased to 10,236. On the average, there were 96 accidents and 28 deaths every day of that year. The situation in subsequent years was not significantly different, although fatality rate reduced to 9,707 in the year 1993 and 6,521 in the year 2000 (FGN 2010). Road safety engineering according to Akinyemi, (1986), is often a set of activities designed to reduce the number and / or severity of accidents on specific road sections by exchanging or modifying some road environment characteristics. Such activities generally consist of planning (identification of safety problems, road locations and feasible road counter measures); implementation (installation or construction of the counter measures); and evaluation (the determination of the degree of effectiveness of the counter measures). In this respect, Odeleye, (2000) reported that the road traffic environment in Nigeria is characterised by over-speeding, blocked drains, narrow pedestrian walkways, bushy road environment, rough and undulating surfaces, black spots (accident prone locations), unfit road intersections, narrow bridges, defaced signs, non-functional traffic lights, irregular road marking, road median not crash worthy (concrete), poor guard railing arrangement, high disregard for traffic law and regulations, and flooded road surfaces.

This description suggests a system that is devoid of modern technology. As a key tool which can be used to improve the movement of people and goods in order to meet the evolving needs of modern economy and society, Intelligent Transport Systems (ITS), a technology toolkit involving a systems approach

to transport often facilitates effective infrastructure management encompassing improved road safety (European Transport Safety Council 1999).

The Federal Road Safety Commission

The Federal Road Safety Commission (FRSC), a government agency with statutory responsibilities for policy making, organisation and administration of road safety in Nigeria was established in February 1988, through Decree No. 45 of 1988 as amended by Decree 35 of 1992 referred to in the statute books as the FRSC Act cap 141 Laws of the Federation of Nigeria, passed by the National Assembly as Federal Road Safety Commission (Establishment) Act 2007.

The functions of the Commission generally relate to:

1. Making the highway safe for motorists and other road users.
2. Recommending works and devices designed to eliminate or minimise accidents on the highways and advising the Federal and State Governments including the Federal Capital Territory Administration and relevant governmental agencies on the localities where such works and devices are required, and
3. Educating motorists and members of the public on the importance of discipline on the highway.

CHALLENGES TO PRIVATE SECTOR PARTICIPATION IN ROAD TRANSPORT INFRASTRUCTURE MANAGEMENT IN NIGERIA

From the foregoing, the key issues which seem to hinder private sector participation in road transport infrastructure management in Nigeria may include:

Inadequate maintenance

In 1985, about 23% of national roads were in a bad state in Nigeria. This situation rose to 30% in 1991, 50% in 2001 and about 60% in 2010 (FGN 2010). The findings of a survey conducted by the Central Bank of Nigeria (2003) revealed that some roads which were constructed over 30 years ago have not had any rehabilitation interventions, thereby resulting in major longitudinal and transverse cracking, depressions, broken bridges and numerous potholes that make road transport both very slow, costly and

unsafe. The survey reported that most of the roads in the Southern and Northern Nigeria were in very poor conditions, and therefore require complete/ total rehabilitation and asphalt overlay, re-instalment of the shoulders, filling of potholes and re-building of collapsed bridges. This implies that road infrastructure in Nigeria probably suffers from inadequate routine maintenance, neglect of periodic maintenance and the absence of emergency maintenance in areas affected by flood, storms and other natural calamities. Absence of adequate road maintenance often reduces the useful life of the roads, thus, resulting in premature and costly road reconstruction, while poor surface increases the operating cost of vehicles and has significant effects on road safety (Campbell, 2009). Furthermore, decisions regarding which roads to improve may depend more upon political factors rather than the economic potential of the proposed route (Porter, 2007).

Misuse of roads

Nigerian roads appear to be heavily motorised. Goods that ought to have passed through the railways and waterways seem to be moved through the road network. The Nigerian road traffic environment is apparently composed of heavy-duty trucks, lorries, trailers, tankers, cars, motorcycles/ tricycles, pedestrians, and cart pushers. Though almost all roads in the federal road network were designed to carry a maximum axle load of about 30 tonnes, many trucks seem to carry up to about 50 tonnes axle loading (Akpokodje 1986). The result of this excess axle loading "overloading" of articulated vehicles is probably the visible ruts and cracks that cause failures and damage to Nigerian roads. Furthermore, the federal roads in Nigeria appear to lack adequate transit park and rest areas, hence, heavy-duty trucks are often parked on highways. Excessively-high axle loads on paved and gravel roads especially during the raining season often contribute substantially to reducing the life expectancy of roads. Thus, a major cause of the declining roads infrastructure might be the misuse of roads due to overloaded trucks (Arumala and Akpokodje 1987).

Over dependence on roads

The dependence on roads in Nigeria presently is almost total simply because the Nigerian railway is almost grounded and air traffic appears low in the country. It is estimated that between 90-95% of the total transport movements is on the road network. Thus, the transport of goods seems not optimised towards the most appropriate mode as the railway and inland waterways modes appear neglected. In this respect, freight and bulk goods are carried over long distances by heavy-duty trucks and tractor-trailers, whose activities are probably responsible for some of the fatal accidents on Nigerian roads.

For example, they are known for overloading, over-speeding and flagrant disregard for traffic laws (Odeleye, 2000).

Poor inter-modal transport system

An integrated transport system often has to do with effective connectivity between ports, rail, road, inland waterways and air, thereby making use of the advantages of different modes to ensure seamless movement of goods and people and better utilisation of resources. For instance, goods arriving by sea appear best transported from the port by rail or inland waterways. However, Nigerian ports, except Port Harcourt and Apapa are not connected by rail and the waterways (FGN 2010). This implies that a comprehensive transportation system which interconnects the various transport modes to make the most use of their individual advantages does not seem to exist at present in Nigeria. Hence, freight transports are probably not carried by the most appropriate transport mode. Bulk cargoes/ goods are carried over long distances by trucks and tractor-trailers.

Institutional issues

Road transport infrastructure management appears to be a complex issue in Nigeria. This is so, because the supply of road facilities cuts across various categories of public agencies. For example, the Federal Ministry of Works constructs and rehabilitates the federal road, the state ministries of works build and maintain state road, while the remaining roads are under the jurisdiction of the local government authorities. FERMA is expected to undertake regular routine maintenance, while the FRSC is responsible for road traffic administration and safety management. Furthermore, the Vehicle Inspection Officers ascertain the roadworthiness of vehicles, the Traffic Police/ Warden controls road traffic, while the Traffic Department of the Nigerian Police Force prosecutes erring road users. Some State Governments also have their own state transport maintenance agencies. Aside from the problem of overlapping objectives and responsibility, there seems to be no attempt to coordinate the activities/ effort of these agencies. In this respect, Malmberg-Calvo (1998) emphasised the need to develop an institutional framework for managing and financing road infrastructure.

Inadequate Funding

Project financing can be described as a business plan for a profitable investment, with a long-term view, and the combination of time and money put together in a dynamic contract with a delegation of responsibility over time (Heather, 2000). The highways and streets on which motor vehicles

travel are often provided, maintained and operated by government as one of its primary function. Highway financing may have to do with sourcing and the usage of capital for the construction and improvement of highways. According to Mabogunje (1998), there are few available avenues in most African countries for raising sufficient revenue to fund urban infrastructure. Moreover, these countries are often restricted by their national governments to a narrow range of revenue. This may be the true state of road development funding in Nigeria, where government solitarily finances all road development projects. In this regard, The Central Bank of Nigeria (2003) reported that since the economic reform in 1999, less than 10% of the funding request made by the Federal Ministry of Works was appropriated, while only about 54% of the appropriation was released. This suggests the fact that funding of road infrastructure projects in Nigeria might have been grossly inadequate. FERMA appears to have an enormous task of maintaining nearly 35,000 kilometres of road network (see table 2), with about 60% of the roads in very serious state of disrepair. Therefore, there seems to be an urgent need for alternative source(s) of finance other than government for road improvement programmes, so as to make the national gridlock more safe, vibrant and viable.

PUBLIC-PRIVATE PARTNERSHIPS: THE WAY FORWARD

Throughout the world, Public-Private Partnerships (PPP) have become increasingly popular as a vehicle to deliver large transportation projects, such as roads, bridges, tunnels, railways, seaports, and airports. The National Council for Public Private Partnership, USA (2009) defined PPP as a contractual agreement between a public sector agency (government) and a private sector entity, through which the skills and assets of each sector are shared in delivering a service or facility for the use of the general public. Globally between 1985 and 2009, more than 950 transportation facilities worth over US$550 billion were newly built, upgraded, or operated through PPP (Public Works Financing 2009). The UK has been widely recognised as the pioneer and leading nation in delivering transportation through PPP, alongside such countries as Australia, Spain, South Korea, Canada, Ireland, France, China and Brazil (Deloitte 2007). The various forms of Public-Private Collaboration include Private Finance Initiative (PFI), Build-Operate-Transfer, Build-Own-Operate-Transfer, Build-Own-Operate, and Design-Build-Finance-Operate/ Maintain. Since 1992 to date, over 67 transportation projects costing more than US$42 billion have been delivered through PFIs, and an additional 12 projects are in the planning pipeline in UK (Her Majesty Treasury 2009). The merits of Public-Private Collaboration are summarised by Li and Akintoye (2003) as: enhancing the government's capacity to

develop integrated solutions; facilitating creative and innovative approaches; reducing the cost to implement the project; reducing the time to implement the project; transferring certain risks to the private sector partner; attracting larger, potentially more sophisticated bidders to the project; and providing avenue to access skills, experience and technology.

DISCUSSION

An effective network of roads and highways often fosters safe, efficient movement of people, goods and services, and contributes to economic growth. Roads and highways directly connect to other transportation modes, hence, are vital to moving raw materials to factories and finished products to markets.

The road network in Nigeria is currently estimated at about 196000 kilometres, with the Federal Government being responsible for managing about 17%, State Governments 16% and Local Governments 67%. However, these roads appear to have been plagued by a number of problems, the major ones being faulty designs, poor drainage system; excess axle loading of articulated vehicles; dumping of refuse on the shoulders, drains and manholes; wrong and harmful parking on the highways; and poor maintenance. Given the long years of neglect of maintenance and severe pressures being exerted on them, many of these roads seem to have deteriorated beyond maintenance and consequently require complete rehabilitation and reconstruction. These problems might have significantly reduced the utility of the roads, negatively impacted on the cost of production and represent a major trigger of cost-push inflation.

In the past, the government had concentrated effort on road construction, but probably much has not been done in the areas of establishing a regulatory framework and introducing measures that would promote effective road transport infrastructure management in Nigeria. The Federal Government had set up some Commissions in the past to address the problem of road maintenance. For instance, The Wey Commission of 1971 examined the organisational structure of highway development and management in five selected countries, and therefore recommended the formation of a Federal Highway Authority for the administration of all federal roads in Nigeria. The 1979 Panel also recommended the setting-up of a parastatal (The Federal Highway Authority) under the then Federal Minister of Works and Housing, for planning, designing, constructing, maintenance and surveillance of federal highways. Similarly, the 1996 workshop launched the 'Road Vision' 2000 and recommended the establishment of an autonomous road agency that would be responsible for road maintenance. Furthermore, the 1999

Presidential Policy Advisory Committee recommended the establishment of a central body to ensure high standards in highways development and maintenance. This Committee also recommended that funding of highways maintenance should be improved by establishing a 'Road Fund', which would derive its funds from highway tolls, vehicle taxes, trucks, petroleum taxes, weigh bridges and parking fees.

In recognition of the challenges of infrastructure development, the Federal Government of Nigeria set up the Infrastructure Concession Regulatory Commission (ICRC, Establishment) Act, 2005. This Act provides for the participation of the private sector in financing, construction, development, operation or maintenance of public infrastructure or development projects of the Federal Government through concessions or other contractual arrangements. The ICRC 2005 is expected to regulate, monitor and supervise the contracts on infrastructure or development projects. The Board of the ICRC was inaugurated in November 2008. However, since its establishment and inauguration, it appears not much has been done to implement the policies contained in the Act.

The problems associated with poor road maintenance policies may therefore have to do with weak or unstable institutional arrangements for managing and financing roads. Fund for road infrastructure projects has been from the Federal Government allocation to the FMW, as well as state and local government allocations for maintenance purposes. The proliferation of agencies appears to have created problems of overlapping objectives, responsibility, conflicts in the provision and management of road transport infrastructure and services, and in the enforcement of traffic laws and regulations. Considering the impact of effective road transport infrastructure services on the economy/ welfare of the society, and the huge amount of money required for its development, it behoves on Nigerian Government to partner with the private sector in order to achieve the desired efficiency and effectiveness in road transport infrastructure services. This is supported by Akintoye and Beck (2009) who identified transportation as one of the major physical infrastructure mainly needed by developing countries to support economic activities, but noted that many developing countries cannot afford this facility without affecting other economic activities because of the cost considerations (initial capital outlay and cost of operation/ maintenance) and lack of appropriate technology.

CONCLUSION

The movement of passengers' and freight has been an integral part of everyday activities, an engine of economic growth, and an important

component of the well-being of the society. Over the years, investment in public infrastructure has been the exclusive responsibility of government. But now, there is an increased trend world-wide, where government collaborates with the private sector in order to bridge the country's infrastructure gap. Nigeria has become increasingly dependent on the road system to meet virtually all its inland transport needs as the rail, pipeline and inland waterway systems have deteriorated. At the same time, the road network itself has suffered from continuing lack of maintenance and investment by the three levels of government, federal, state and local. Thus, this study carefully identifies inadequate maintenance, misuse of roads, over dependence on roads, poor inter-modal transport system, institutional issues, and inadequate funding as key issues which do not allow the active involvement of the private sector in road transport infrastructure delivery in Nigeria.

Therefore, in order to provide high quality, cost effective, all-weather, safe, reliable and environmentally sensitive road infrastructure of world-class status that guarantees 'value for money' benefit to all road users, this study strongly recognises the need for an adequate, enforceable and enabling legal/ regulatory collaborative engagement framework for road transport infrastructure management in Nigeria. The framework would encourage and remove all barriers towards the private sector participation in the development, provision, maintenance, operation, and upgrading of road transport infrastructure and services. This would guarantee regular attention as well as adequate finances for construction, rehabilitation, routine repairs, and integration through which the road traffic environment will enjoy the benefits of modern technology like Intelligent Transport System/ telematics component installation along Nigerian road network. Furthermore, it would also integrate modes of transport infrastructure services for convenient and seamless travel, using modern systems like electronic ticketing and payment.

REFERENCES

Adesanya, A (1998) Transport Development, In: Phillips, A.O., Titiola, S.T (Eds) Nigeria in 2010, Nigeria Institute of Social and Economic Research (NISER), Ibadan, Nigeria pp 181-193.

Akintoye, A and Beck, M (2009) Policy, Finance, and Management for Public-Private Partnerships, Wiley-Blackwell, West Sussex, United Kingdom ISBN 978-1-4051-7791-7.

Akinyemi, K. E (1986) Problems with Planning, Implementation and Evaluation of Road Traffic Safety Engineering Programmes in Nigeria, In Asalor, J. O (Ed) Road Traffic Accidents in Developing Countries, Joja Publisher, Benin, Nigeria.

Akpogomeh, O. S (2002) Transport and Communication, In: Africa Atlas of Nigeria, Les Editions J.A, 57 bis, rue d' Autenil, 750 16 Paris, France, pp. 106-109.

Akpokodje, E. G (1986) The geotechnical properties of lateritic and non-lateritic soils of South- eastern Nigeria and their evaluation for road construction. Bulletin of the International Association of Engineering Geology, 33, Paris, pp. 115-121.

Arumala, J. O and Akpokodje, E. G (1987) Soil Properties and Pavement Performance in the Niger Delta, Quarterly Journal of Engineering Geology, 20, pp. 287-296.

Brockenbrough, R.L and Boedecker, K. J (2007) Highway Engineering Handbook: building and rehabilitating the infrastructure, McGraw-Hill Book Company Inc. USA.ISBN 0071597638.

Brushett, S. (2005) Management and Financing of Road Transport Infrastructure in Africa, Sub-Saharan Africa Transport Policy Programme Discussion Paper No. 4. The Sub-Saharan Africa Transport Policy Programme.

Campbell, A. E (2009) Federal Road Management for Sub-Saharan African Nations: A Nigerian Case Study, Unpublished M.Sc Thesis, University of Waterloo, Ontario, Canada

Central Bank of Nigeria, (2003) Highway Maintenance in Nigeria: Lessons from Other Countries, Research Department Occasional Paper Series 27, Central Bank of Nigeria, Abuja, Nigeria

Deloitte, R (2007) Closing the Infrastructure Gap: The Role of Public-Private Partnerships, London, Deloitte Development

European Commission's Directorate-General for Energy and Transport (2006) Road Transport Policy. European Commission, Brussels ISBN 92-79-03148-1

European Transport Safety Council (1999) Intelligent Transport Systems and Road Safety, ETSC, Brussels, ISBN 90-76024-05-7

Federal Government of Nigeria (2010) Draft National Transport Policy, Federal Government Press, Abuja, Nigeria

Heather, A (2000) Investing in Efficient Urban Rail Mass Transit, Public Transport International, Bruxelles, pp. 19-28

Heggie, I. G and Vickers, P. (1998) Commercial Management and Financing of Roads, World Bank Technical Paper 409, Washington D.C

Her Majesty Treasury, (2009) Public-Private Partnerships signed Project List. HM Treasury, 15 September, Available online: http://www.hm-treasury.gov.uk/ppp_pfi_stats.htm

Ibrahim, A (1980) Lagos-Ibadan Expressway: Problems and Solutions. Proceedings of National Engineering Conference of Nigerian Society of Engineers, pp. 201-215

Kendrick P., Copson, M., Beresford, S., McCormick, P (2004) Roadwork: Theory and Practice, 5th ed. Elsevier Butterworth-Heinsemann, Oxford ISBN 0750664703

Li, B and Akintoye, A (2003) An Overview of Public-Private Partnerships; Managing Risks and Opportunities, Edited by Akintoye, A., Beck, M and Hardcastle, C. Blackwell Publishing Company, United Kingdom

Mabogunje, A. L (1998) Preparing African Cities for the Bond Market, Urban Age Spring, USA, pp. 20-23

Malmberg-Calvo, C (1998) Options for managing and financing road transport infrastructure, Washington DC: World Bank Technical Paper 411

Odeleye, J.A (2000) Towards Financing and Planning Road Safety Audit Operations in Nigeria, International Association of Traffic Safety Systems Research, 24(2) pp. 85-96

O'Flaherty, C.A (2007) Highways: The Location, Design, Construction and Maintenance of Pavements, 4th ed. Butterworth-Heinemann, Oxford ISBN 0750650907

Ola, S.A (1978) Geotechnical Properties and Behaviour of Some Stabilised Nigerian Lateritic Soils, Quarterly Journal of Engineering Geology, 2, pp. 145-160

Oni, S. I (2008) Development of Inland Ports in Nigeria, In: Oyesiku, O.O., Gbadamosi, K.T (Eds). Port Administration and Development in Nigeria, first ed. Heinemann Educational Books Nigeria Publishers, pp.89-99

Oni, S.I and Okanlawon, K (2006) Nigeria's Transport Infrastructure Development: An integral part of the national economic empowerment and development strategy, Journal of Social and Policy, Issues 3(2), pp. 7-13

Porter, G (2007) Transport Planning in Sub-Saharan Africa: Progress Report. Progress in Development Studies 7(3) pp. 251-257

Potter, A., Lalwani, C (2008) Investigating the Impact of Demand Amplification on Freight Transport. Transportation Research Part E 44, pp. 835-846

Public Works Financing (2009) International Survey of Public-Private Partnerships, Public Works Financing, 242, Pp. 1-8

Queiroz, C and Gautam, S (1992) Road Infrastructure and Economic Development: Some Diagnostic Indicators. Policy Research Working Paper Series 921, The World Bank Group, Washington, D.C

Queiroz, C and Kerali, H (2010) A Review of Institutional Arrangements for Road Asset Management: Lessons for the Developing World, Transport Papers 32, The World Bank Group, Washington, D.C

Slinn, M., Mathews, P., Guest, P (2005) Traffic Engineering Design: Principles and Practice, 2nd ed. Elsevier Butterworth-Heinemann, Oxford. ISBN 0750658657

Transport Research Laboratory, (1998) Guidelines for the Design and Operation of Road Management Systems, Overseas Road Note 15, Transport Research Laboratory. Berkshire, United Kingdom

Ubogu, A.E., Ariyo, J. A., Mamman, M (2011) Port-hinterland Trucking Constraints in Nigeria, Journal of Transport Geography 19(2011) pp106-114