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Compendium Report on  
ROAD INFRASTRUCTURE & RELATED DEVELOPMENT  
IN NIGERIA - **AN INVESTOR'S MANUAL**

20  
13



Federal Ministry Of Works



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Federal Ministry Of Works





Third Mainland Bridge, Lagos.

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## Honourable Minister's Message

This Compendium Report on Roads Infrastructure and Related Development in Nigeria – An investors' Manual is an insight into the development of the road sector under the administration of President Goodluck Ebele Jonathan, GCFR.

A careful study of this report highlights the importance that the Federal Government attaches to infrastructure development especially the roads.

This emphasis re-affirms Mr. President's declaration that, the transformation agenda in the road sector seeks "to deliver better and safer roads to Nigerians, as well as to link the six geo-political zones in the country with dual carriageways".

In furtherance of the transformation agenda in the road sector and in its urgent bid to meet the yearnings of the public, the Federal Ministry of Works has also embraced some institutional reforms which will pave way for private sector financing of road infrastructure in Nigeria.

In order to achieve this aim, the Ministry has embarked on the development of human capacity to cater for this new trend of road infrastructure development through the Public Private Partnership (PPPs). Already, a number of Outline Business Cases (OBC) has been prepared for candidate roads under this scheme.

All of these could not have been possible without the management reforms in the Ministry. These reforms at the inception of this administration in 2011, gave room for the creation of Six Zonal directorates of Highway Construction and Rehabilitation, and the restructuring of the former Departments of Highway Planning and Design into six Departments at the Headquarters (Planning & Development, Road Design, Bridge Design, Materials; Geotechnics & Quality Control, PPP and RSDT).

The Zonal Directorates are each headed by a Director domiciled in the six zones and this has helped in close grassroots supervision and monitoring of projects.

The Federal Ministry of Works is also in close collaboration with multi-lateral agencies such as the African Development Bank and World Bank in the financing of the rehabilitation of some critical roads across the country. There is no doubt that the roads in Nigeria are getting better and the hopes are still high.

I am therefore using this opportunity to call for private investors' participation in the financing of road infrastructure and development in Nigeria.

Arc. Mike O. Onolememen. FNIA, FNIM  
Honourable Minister of Works,  
Federal Ministry of Works.

Ahmadu Bello Way, Victoria Island, Lagos



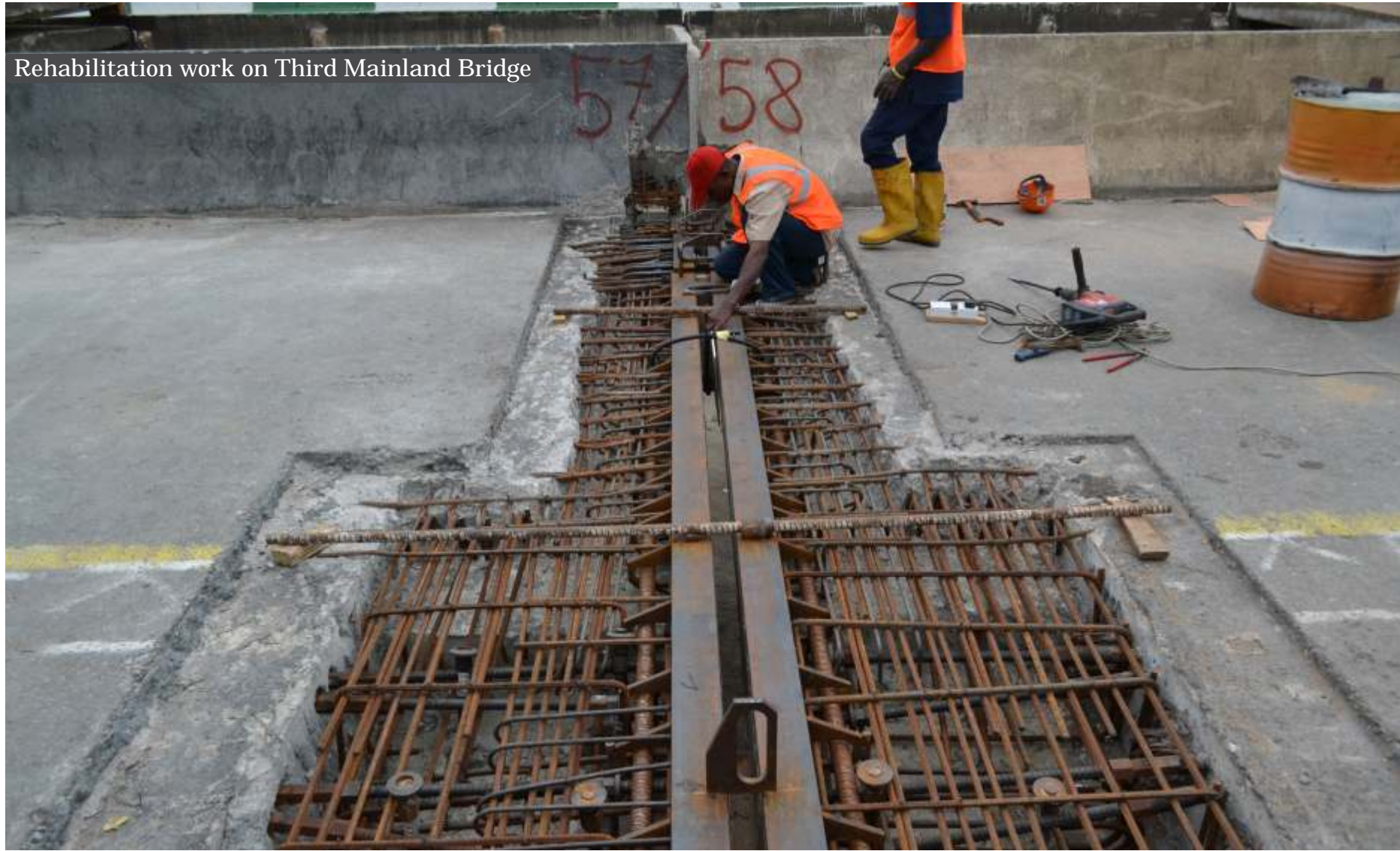


“ Nigeria ranks tops compared with other countries in Sub-Saharan Africa in terms of road network. The country has the largest road network in West Africa and the second largest, south of the Sahara with an estimated 200,000km of road network connecting villages to cities, the distant with the near and the inter-land with the urban market. ”

Carter Bridge, Lagos Island.









### 3. Executive Summary

In Nigeria, socio-economic development goes as far as road infrastructure improvement can attain. This is simply because to connect means to grow. In order to catalyze the present rate of growth and development of the economy, the requisite road infrastructure must be put in place. According to a report ("Reforming Road Transport in Nigeria", 2009), Nigeria ranks tops compared with other countries in Sub-Saharan Africa in terms of road network. The country has the largest road network in West Africa and the second largest, south of the Sahara with an estimated 200,000km of road network connecting villages to cities, the distant with the near and the inter-land with the urban market.

Today, 95% of both passenger and freight movements are by road in Nigeria largely due to inadequacy of other forms of transportation in the country. The federal roads account for only about 17% of the total national road network but accommodate more than 80% of national vehicular and freight traffic bearing in mind a 2.533% population growth rate per annum. In addition, new vehicle importation in the country increased by 45% in 2011, and the first half of 2012 recorded an increase by 15% compared with the same period in 2011. Apparently, Nigeria is getting more cars on the road making reformation and maintenance of the roads very essential.

All of these indices clearly justify the need to enhance road infrastructure delivery to support this expanding populace. However, the task is enormous and requires huge investment, for a country of its size, an assessment of the current state of road

infrastructure is indicative of the fact that the country has fallen short of international benchmarks.

Against this background, the Federal Government of Nigeria has recognized the challenges and opportunities inherent within the nation's road infrastructure sector. Moreso, the government of Nigeria has also identified a workable approach to tackling the challenges facing the sector while harnessing the economic gains of an enhanced road network. As a proactive approach, the Federal Government has embarked on road sector reforms which basically seek to improve service delivery, enhance management capacity and create a conducive institutional, legal and regulatory framework through joint participation with the private sector in financing and management of the road sector. Also in addition, the government has been able to secure concession loans from multi-lateral and bi-lateral agencies for road sector development. The RSDT program is being funded by these types of concession loans.

Furthermore, it is the view of the government that with the involvement of the private sector in the road sector, growth and development will be facilitated. Typically, good roads imply reduced travel time and vehicle operating costs and provide the necessary ingredient for development of other forms of transportation. In addition, economic, commercial and business activities will also thrive along these routes by virtue of increased traffic flow and hence profitability. This is evident by the visible effect of road infrastructure development on real estate property values. One of

the critical factors that determine the value of any real estate property or its location are the amenities available in proximity and one of such amenities is provision of road infrastructure.

Essentially, this report was generated to document the state of road Infrastructure in Nigeria and the investment potentials in Nigeria's road infrastructure sector. In addition, the report highlights the existing opportunities that the private sector investors can take hold of in partnering with the public sector. Both parties will partner, through a Public Private partnership (PPP) structure, to provide good roads for strategic routes with very high potentials as regards return on equity.

While this report is intended to be a veritable advocacy document that will guide potential private sector investment, it would also prove useful to relevant stakeholders involved in the development, construction, maintenance and management of road infrastructure in Nigeria.

Lafenwa Bridge, Ogun State



## 4. INTRODUCTION

The total road network in Nigeria is estimated at 200,000km and this represents the principal means for freight and passenger movements across the country<sup>1</sup>. The Road transport assumed a more significant role and most utilized mode of freight movement since the collapse of the rail system in the 1970s/80s. Today, road transportation accounts for nearly 95% of all modes of transport and estimated N200b growing at 10% per annum compared with other developed economies such as South Africa, UK and US.

Transport is the cornerstone of civilization<sup>2</sup> as it is an essential part of human activity. As society and economic organizations become more complex, the relevance of transport grows. Road transportation in particular plays a significant role in the economic development of any nation, reason being that a large proportion of its economic activities are largely dependent on an efficient network of roads. Indeed, no two locations will interact effectively without a viable means of movement from one point to another.

A 2005 study<sup>3</sup> by Willoughby underscored the correlation between transport and economic development. The studies advocate that socio-economic development can be catalyzed by the presence of infrastructure. If these facilities and services are absent, development will be very difficult and in fact can be likened to a very scarce commodity that can only be secured at a very high price and cost.

Moreso, according to study<sup>4</sup> by Cesar and Surhid, Road infrastructure has been identified to form a major factor for economic growth and development of any country. In this study, an empirical approach was employed to explore the association between road infrastructure and

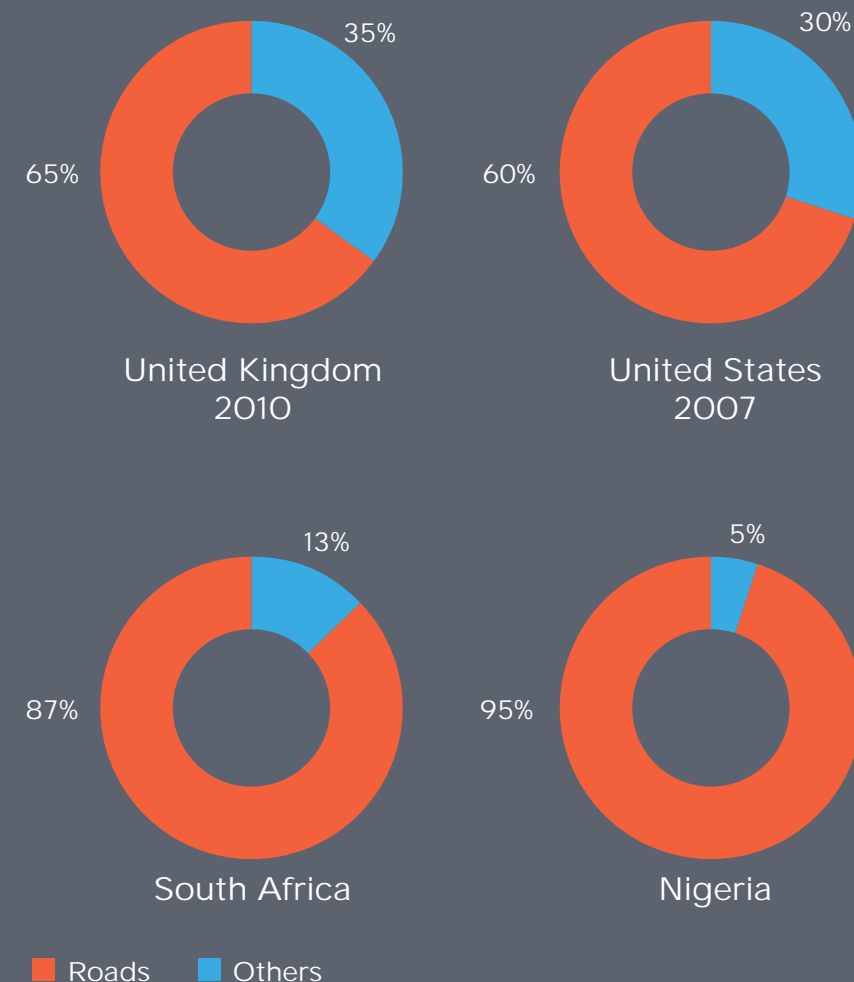


figure 1: Road Transportation in Developed Countries  
Source: Model by Pison Housing Company.

<sup>1</sup>Profile of Road Sector Development Team (RSDT), Federal Ministry of Works

<sup>2</sup>Nigeria's Transport Infrastructural Development: An Integral Part of the National Economic Empowerment & Development Strategy

<sup>3</sup>Willoughby, 2004a; and World Bank, 2005

<sup>4</sup>Cesar and Surhid, 1992 World Bank Study

economic development. The study revealed that there are consistent and significant associations between economic development, in terms of per capita gross national product (GNP), and road infrastructure, in terms of per capita length of paved road network. Furthermore, the study also showed that road condition seems to be associated with economic development. Indeed, good infrastructure raises productivity and lowers production costs. Thus, it is clear that infrastructural development is a function of economic development.

The Federal Government has therefore embarked on bold steps in the rehabilitation, re-construction, construction and expansion of major arterial highways in the country. Against this backdrop, there have been a number of challenges confronting efforts of the government in the delivery of improved road infrastructure. One of the major challenges is attributable to the funding gap in road infrastructure delivery.

Hitherto, the finance of road projects has been through a meagre annual budgetary allocation which has proved inadequate to fund road infrastructural development. On the average, the annual funding requirement is estimated at NGN500bn over the next ten years against an average budgetary allocation of NGN120bn with a shortfall of NGN380bn. In 2012 alone, out of the NGN133bn budgetary allocation for road infrastructure development only NGN102bn was released with a shortfall of NGN21bn unimplemented. These shortfalls have proven to have dire negative consequences on the development of road infrastructure.

Furthermore, it has become imperative for the Federal Government to source for alternative means of funding in order to achieve its objective of keeping roads in good condition and plan for future growth. The Federal

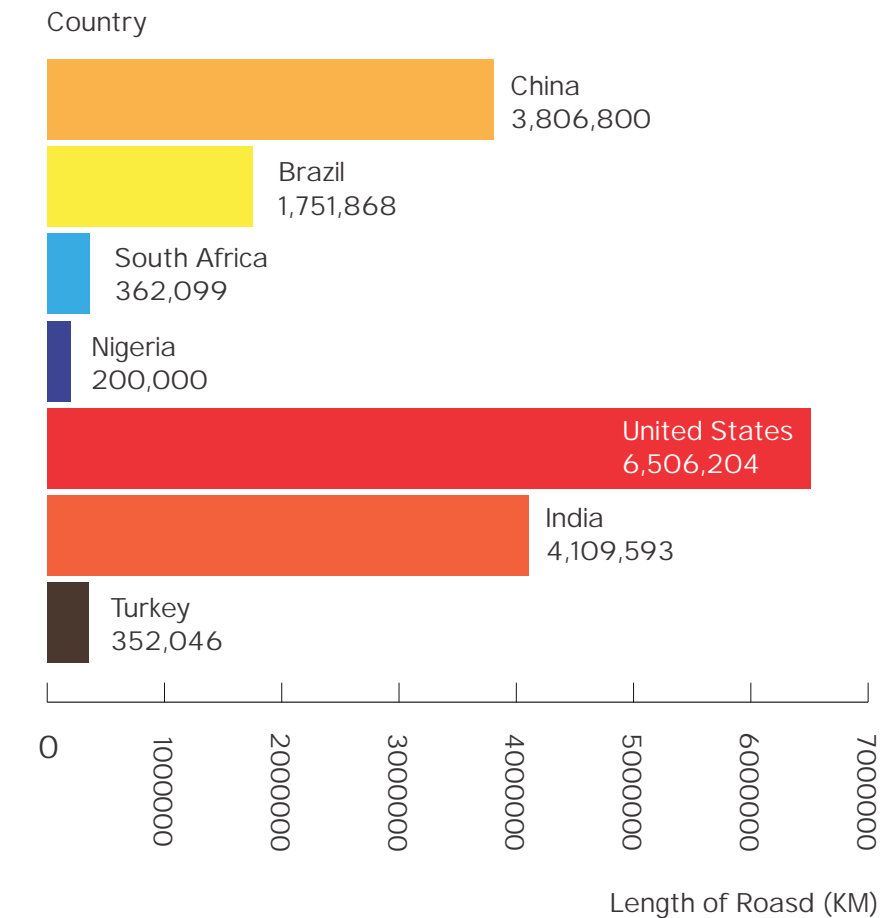


figure 2: Length of Road in Selected Countries  
Source: Federal Ministry of Works.



Government through the Ministry of works is presently working to reduce dependence on Public finance by facilitating private sector participation as well as encouraging funding by multi-lateral Agencies on road development.

The connection between good roads and economic development has been established, it is clear that infrastructure development plays a vital role in the economic well-being of any nation. Putting the statistics under perspective, it has shown that Nigeria still has a huge task ahead. The total road network in Nigeria currently estimated at 200,000km remains to be improved in order to bring them to sync with road infrastructure development in other thriving economies such as USA, China, Brazil, Turkey, India and South-Africa. The comparative analysis as shown by the figure 2 will provide a clearer view of enormity of the challenge facing economic development of the nation.

It is against this background that this report aims to document the state of road Infrastructure in Nigeria and the investment potentials for investing in Nigeria's road infrastructure. While it is intended to be a veritable advocacy document that is envisaged to guide potential private sector investors in making appropriate informed investment decisions. It would also prove useful for relevant stakeholders involved in the development, construction, maintenance and management of road infrastructure in Nigeria.

### 3. OBJECTIVES OF THE REPORT

Nigeria is an emerging economy with exploding road infrastructure requirement. Typically, there is a growing funding gap between public spending on road infrastructure and capital needed to build new roads infrastructure, upgrade and maintain existing ones.

The projected estimate of funding requirements of about NGN 500bn on the average annually must be spent over the next ten years to fix, build and reconstruct Nigeria's ailing roads and bring them to sync with road infrastructure development in other thriving nations. Hence the need for the Federal Government of Nigeria to turn to private investors to share the costs, risks, rewards of building, financing, constructing and operating infrastructure.

The principal objective which this report aims to achieve is to showcase to the prospective investors the investment opportunities which exist within the road infrastructure and related development.

**“ On the average, the annual funding requirement is estimated at NGN500bn over the next ten years against an average budgetary allocation of NGN120bn with a shortfall of NGN380bn. In 2012 alone, out of the NGN133bn budgetary allocation for road infrastructure development only NGN102bn was released with a shortfall of NGN21bn unimplemented. ”**

Carter Bridge, Lagos.

Objectives of the 05  
Report



## 6. Overview Of Nigeria

Nigeria is a country blessed with the perfect combination of abundant human and natural resources and should earn its rightful position among the top 20 economies of the world in less than seven years, the time lag for the vision 20:20:2020 agenda.

Nigeria operates a federal system of administration comprising of 36 States and a Federal Capital Territory, 774 Local Government Areas. The Capital city is Abuja and the largest state in terms of population, also referred to as the commercial capital of the nation is Lagos state with an estimated 17 million.

### 6.1 Demographics

Nigeria, Africa's most populous country, is composed of more than 250 ethnic groups. The figure 3 shows the most populous and politically influential:

Languages:  
English (official), Hausa, Yoruba, Igbo (Ibo), Fulani, over 500 additional indigenous languages

Population:  
The Federal Republic of Nigeria is ranked as the 14<sup>th</sup> largest country in Africa and the 40<sup>th</sup> in the world. Nigeria is the most populous country in Africa with an estimated population of 167million<sup>5</sup> growing at a rate of 3.2% which accounts for approximately one sixth of African population (or one fifth of Sub-Saharan African population) and 2.36% percent of the world population

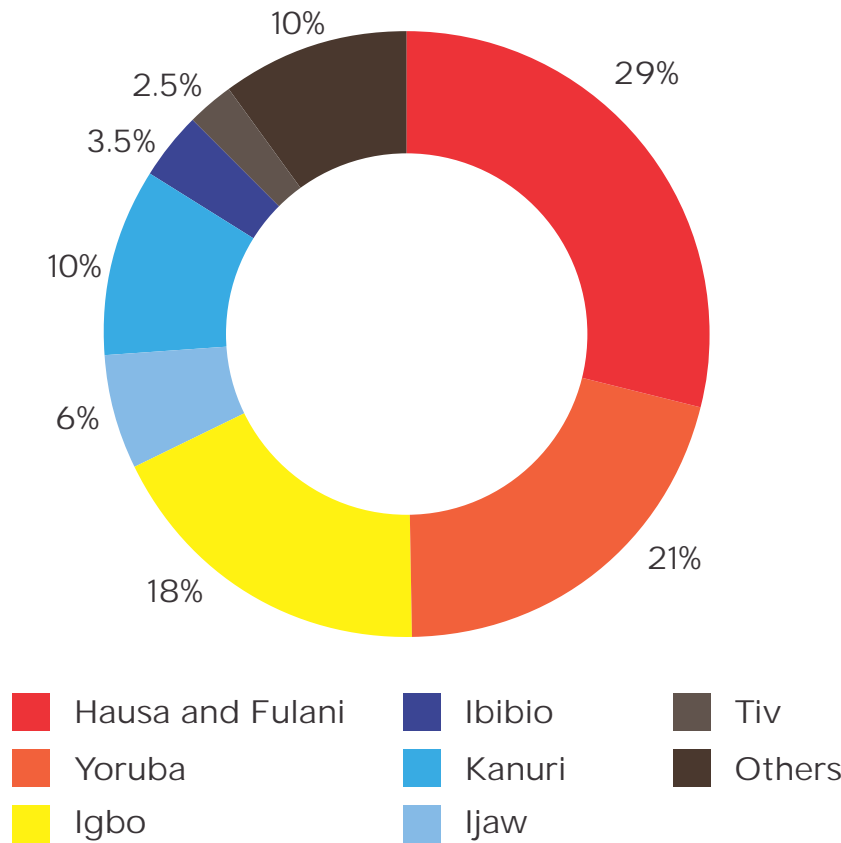


figure 3: Most Populous Ethnic Groups in Nigeria  
Source: www.indexmundi.com

<sup>5</sup> [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_population](http://en.wikipedia.org/wiki/List_of_countries_by_population)

Age Structure:  
The median age structure is found

Age Structure	Percentage of the Population (%)	Male	Female
0-14 years	43.9	38,232,053	36,483,243
15-64 years	53.1	44,862,457	45,484,314
65 years and over	3.0	2,325,682	2,735,991

Table 1: Nigerian Population Age Structure  
Source: CIA World Fact book 2012 estimates

Urbanization

URBAN POPULATION  
**50%**  
Of Total Population (2010)

RATE OF URBANIZATION  
**3.5%**  
3.5% Annual Rate of Change (2010-15 est.)

Median Age

Male  
**17.5**

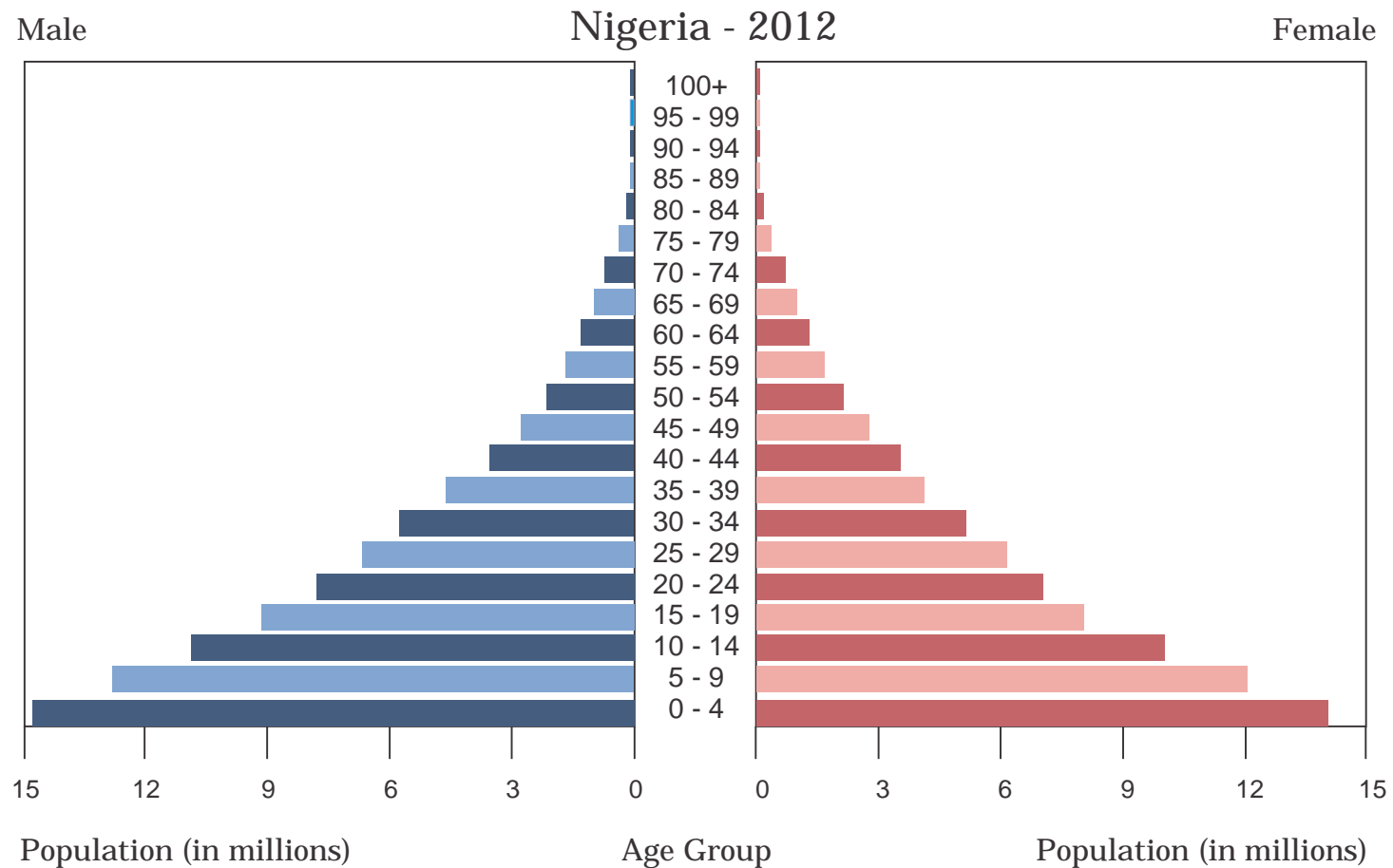
Female  
**18.4**

Total (Male+Female)  
**17.9**

Source: CIA World Fact book 2012 estimates



figure 4: Population Pyramid  
Source: CIA World Fact book 2012 estimates



## 6.2 Topography

Nigeria, the largest country in West Africa has a geographical coordinates of 10 00 N, 8 00 E<sup>6</sup> and is strategically located at the centre of opportunities of the world. The country shares boundaries with five different countries, the Republic of Benin in the west, Chad and Cameroon in the east, and Niger in the north and its coast in the south lie on the Gulf of Guinea on the Atlantic Ocean. Nigeria ranks 32<sup>nd</sup> by its total area of 923,768km comprising 910,768km of landmass delimited by international boundaries and/or coastlines, excluding inland water bodies (lakes, reservoirs, rivers) and 13,000km of water including all inland water bodies, such as lakes, reservoirs, or rivers, as delimited by international boundaries and/or coastlines accounting for 1.4% of total area.

Nigeria's climate conditions vary from one region to another. The climate is equatorial in south, tropical in center, arid in north. More so, the terrain also vary from the southern lowlands merging into central hills and plateaus; mountains in southeast, plains in northern region.

The country is blessed with abundant mineral resources including 33 solid minerals in commercial quantity in 450 locations across the country<sup>7</sup> Nigeria is one of the largest exporters of crude oil and natural gas and has the biggest cement plant in the world.

## 6.3 Nigeria's Economic Outlook

Nigeria has an economic growth rate of about eight percent per annum, a robust GDP growth rate of about 12 percent<sup>8</sup> is anticipated in the next five years translating to a nominal GDP of about USD500bn. Nigeria's vision

20:2020 aspiration to achieve a GDP of USD900bn by the year 2020 is predicated on improved overall sectoral performance, one of which is the road sector.

According to a fourth Quarter 2012 report<sup>9</sup>, the economic outlook is stable as S&P raised its long-term foreign and local currency sovereign credit ratings of Nigeria to 'BB-'from 'B+', just 3 points below investment grade, Moreso, Moody's expanded its coverage to include Nigeria, assigning a 'Ba3' rating and Fitch Ratings affirmed Nigeria's Long-term foreign and local currency Issuer Default Ratings (IDR) of 'BB-'and 'BB' respectively.

The main factors responsible for the improved rating include tighter fiscal policy stance, improved infrastructural development, and growing external reserves. However, there are rising concerns over the security challenges of some parts of the country, weak governance, relatively poor business climate and sticky inflation. The government of the present administration is committed to overcoming these challenges in a bid to making the country the next investment destination in the world.

The report went further to state that the economy when measured by the Real Gross Domestic Product (GDP) grew by 6.48% in the third quarter of 2012 as against 7.37% in the corresponding quarter of 2011.The lower growth can be attributed to the impact of flooding in some parts of the country which reduced the country's agricultural output given that Agriculture is over 40% of the GDP.

This led to a rise in food prices which increased inflationary pressures. Consequently inflation spiked to 12.30% in November from 11.70% in October and 11.30% in September. However, the external reserve appreciated by 7.26% to close the year at

<sup>6</sup> CIA World Fact Book

<sup>7</sup> The Punch, 2011

<sup>8</sup> Keynote Address by Honourable Minister during US-Nigeria Infrastructure Conference Oct 2012.

<sup>9</sup> Stanbic IBTC Asset Management Limited Quarterly Economic Review Q4:2012



\$44.178 billion largely as a result of increased foreign portfolio inflows and high oil prices. Consequently, the Naira appreciated slightly by 0.59% to close the year at \$155.77 as the Central Bank of Nigeria sold N3.12 billion in Q4 2012 compared to N5.34 billion in Q3 2012 at the Weekly Dutch Auction System.

The National Assembly formally passed a budget of N4.987 trillion for 2013 on 20 December 2012, compared to N4.75 trillion approved for 2012. The main highlights include a crude oil budget benchmark of \$79 up from \$72 per barrel, a reduction in the nation's budget deficit to 2.17% from 2.85% and recurrent expenditure was slashed by over N50 billion to N2.38 trillion, while capital project allocations was increased to N1.62 trillion from N1.34 trillion in 2012. Following the modest improvement in infrastructural development such as road, power generation, key reforms in the agriculture sector and expectations of the passage of the Petroleum Industry Bill ("PIB") in 2013, the economy is expected to grow even further compared to 6.77% recorded last year.

During last year, there was a general improvement in investors' confidence due to the reforms and initiatives such as increased oversight on corporate governance, introduction of market making and improvements in Nigeria's macroeconomic environment.

The economic profile of Nigeria shows that the country's economic potential is very great. The trends in GDP growth rate and recurrent expenditure as percentage of GDP are presented in figure 5.

According to a publication<sup>10</sup> release in 2012, Nigeria's most GDP annual growth rate of 7.1% is more than the annual population growth rate of 3.2%.

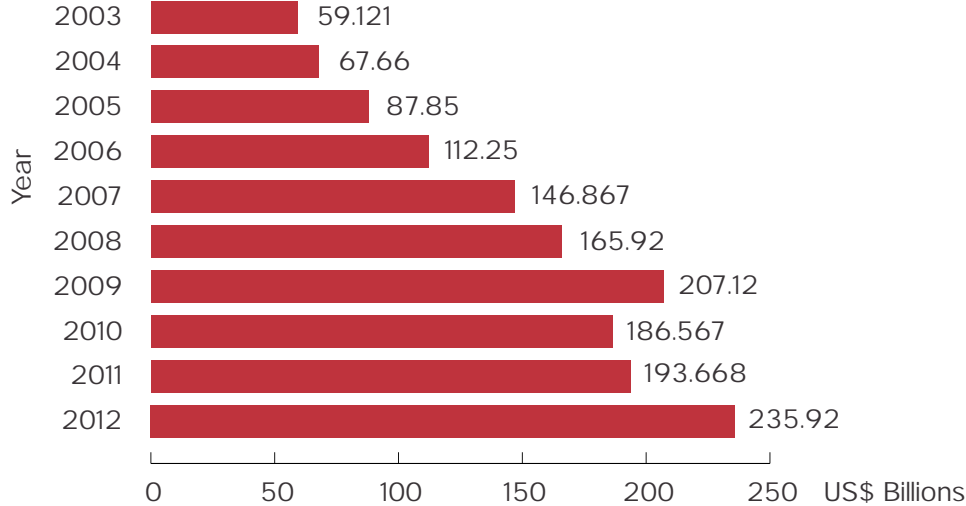


figure 5: Nigeria's Annual GDP Values  
Source: www.tradingeconomics.com

However, this impressive economic growth has been weakened by the high figure of poverty of 54.4%. Among the top 60 countries, Nigeria's poverty figure is the second highest, with Columbia's of 64% being the worst.

Indeed, many of the countries likely to contend with Nigeria to be among the top 20 currently have lower poverty figures, hence, Nigeria needs to attain annual GDP growth in excess of 10% per annum and strive to catch-up and overtake some of the countries in the top 20 largest economies by 20:2020. This can be achieved with prudent and efficient management of her resources.

Abakiliki-Afikpo Road, Ebonyi State.

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<sup>10</sup> Vision 20:2020 and the Challenges of Infrastructural Development in Nigeria, Mobolaji Olaseni and Wale Alade Feb 1, 2012.



## 7. Overview Of Road Infrastructure In Nigeria

### 7.1 Classification Of Roads In Nigeria

The Nigerian road network from the colonial days to the present day, have been classified into three namely Trunk A, B & C.

A

These roads forms the skeleton of the national road grid. They cut across regional boundaries in the country and even extend to the international borders of neighbouring West African countries. These categories of roads are under Federal Government's ownership. They are designed, constructed, maintained and financed by the Federal government through the Federal Ministry of Works. The Federal Road Maintenance Agency (FERMA) is in charge of carrying out maintenance of this class of roads.

B

These roads are the second category of main roads in Nigeria. They link the major cities within States with the State capitals. These roads are designed, developed, financed and maintained by the State governments through their Ministries of Works, Transport or Infrastructure. The primary objectives of Trunk B roads are to enhance the socio-economic development of the various States in the country.

C

These roads are local feeder roads constructed and maintained by the Works Department of Local Government Authorities in Nigeria. This class of roads are primarily not concrete asphalted and affected by seasonal weather changes. The roads link villages and communities in the remote parts of each local government region.

figure 6: Classification of Nigeria's Roads

Source: State of Infrastructure Report on Nigerian Highways by MCS Consulting, et al, December 2011.

### 7.2 Ownership And Economic Service Structure

The total national road network is approximately 200,000km made up of 33,000km, 50,000km and 117,000km for Federal, State and Local Government respectively depicted by the chart below. Only about 65,000km of the 200,000km are paved mostly in bituminous layers others are earth roads. Out of this, the Federal Government owns about 35,000km representing 54% of the entire bituminous road network in Nigeria. The balance is shared between the 36 States and the 774 Local Government Areas.

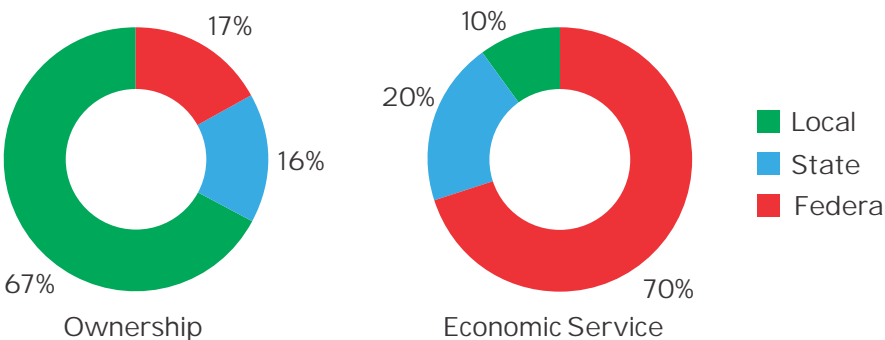


figure 7: Ownership & Economic Service Structure

Source: Pison Housing Company/US-Africa Infrastructure Conference Presentation, June 2012.

According to the Constitution of the Federal Republic of Nigeria, the different tiers of government have independent responsibilities for the planning, financing, constructing and maintenance of the roads under its

respective jurisdictions.

Most of the freight and passenger movement in the country are conveyed by road. The diagram below provides a comparative analysis of the number of vehicles over three decades

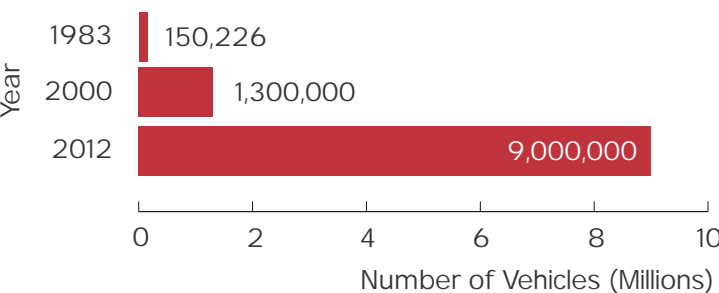


figure 8: Annual Vehicular Traffic

Source: Federal Ministry of Works

Even though Federal roads constitute only 17% of the total national stock, they carry more than 80% of the National vehicular traffic, thus underscoring their crucial importance to the economy of the country. The Federal roads have been subjected to severe pressure as a result of increased vehicular traffic as well as freight especially given the near absence of rail, marine and other forms of transport to convey heavy goods.



“ Even though Federal roads constitute only 17% of the total national stock, they carry more than 80% of the National vehicular traffic, thus underscoring their crucial importance to the economy of the country. The Federal roads have been subjected to severe pressure as a result of increased vehicular traffic as well as freight especially given the near absence of rail, marine and other forms of transport to convey heavy goods.”

Vom-Manchok Road, Plateau State.



Race Course Bus Terminal, Lagos.

“Advancing towards a self-governing Federal Highway Authority, RSDT has a mandate to initially manage the implementation of RSDMP on behalf of the Federal Ministry of works over a 10-year period with the assistance of a USD330million credit from the International Development Association - IDA (i.e. World Bank - WB), and a USD162million loan from the African Development Bank (AfDB)...”

## 8. Road Infrastructure Development In Nigeria

The Federal Ministry of Works is charged with the responsibility of developing the Nation's Federal Highway infrastructure. The Ministry has a critical role to play in the Transformation Agenda of the present administration. The Ministry has identified road infrastructure not only as critical in the socio-economic development of the country but also a crucial and pivotal resource required to fast track the development of other modes of transportation.

To this end, the federal ministry of works has a four-fold mandate which includes the following;

- i.* Planning, construction, rehabilitation and maintenance of Federal Roads;
- ii.* Planning, construction, rehabilitation and maintenance of bridges along Federal Highways;
- iii.* Provision of facilities such as street lights, road signs and markings on Federal Roads; and
- iv.* Providing professional services to other MDAs.

In discharging its responsibilities, the ministry has a single line of command from the Honourable Minister to the Minister of State through the Permanent Secretary to the Departments and Units and vice versa.

To re-invigorate and make the management of the nation's road network and on-going projects more effective, the existing two operational departments were re-structured as shown in figure 9. In addition, the ministry is also charged with the responsibility of supervising the Federal Roads Maintenance Agency (FERMA) and the Office of the Surveyor-General of the Federation (OSGOF).

In further campaign for road infrastructure development, the Federal Government of Nigeria through the then Federal Ministry of Transport instituted a road reform process termed as Road Vision 2000 (RV 2000) in June 1996. The Government-led RV2000 laid the foundation for the creation of a National Roads Board and a Road Fund with a mandate to establish a stable and sustainable basis for road infrastructure development and legal framework for private participation in management and financing of Road projects.

The Federal Government through the Ministry of Works, with the assistance of World Bank, further advanced the RV2000 program to the establishment of a Road Sector Development and Maintenance Program (RSDMP) in 2004. To coordinate the program, the RSDMP was established as a ten (10)-year prioritized program to be implemented by a Road Sector Development Team (RSDT).

The RSDT is a self-accounting, performance-based semi-autonomous unit within the institutional framework of the Federal Ministry of Works.

Advancing towards a self-governing Federal Highway Authority, RSDT has a mandate to initially manage the implementation of RSDMP on behalf of the Federal Ministry of works over a 10-year period with the assistance of a USD330million credit from the International Development Association - IDA (i.e. World Bank - WB), and a USD162million loan from the African Development Bank (AfDB) etc.

The first phase of the implementation process of the RSDMP comprised the creation of the Federal Road Development Program (FRDP). The FRDP is a major investment in improving road infrastructure in Nigeria.



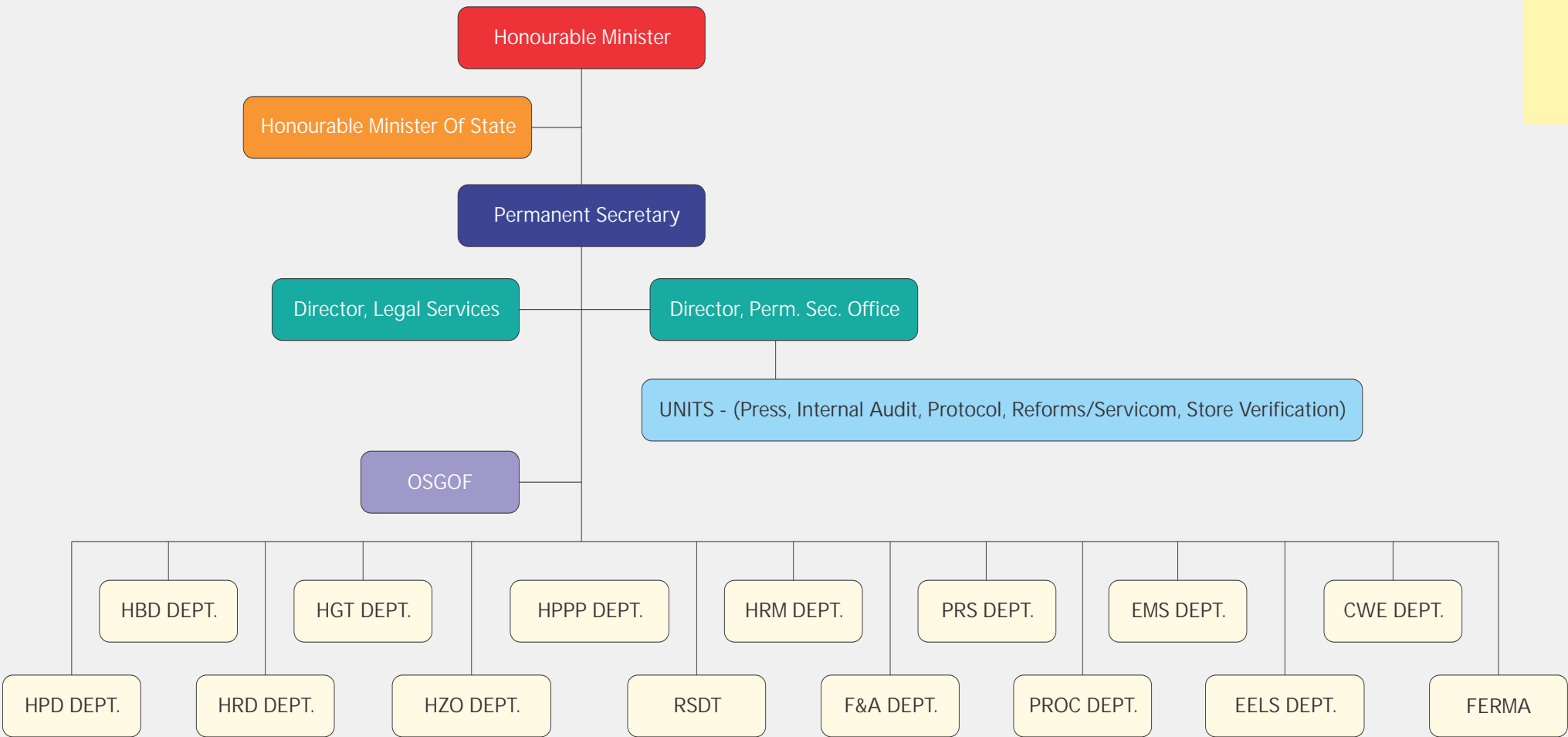
“ To re-invigorate and make the management of the nation's road network and on-going projects more effective, the existing two operational departments were re-structured as shown in the diagram.”

Third Mainland Bridge, Lagos

KEY DEFINITIONS

HPD – Highways Planning & Development;  
HBD – Highways Bridge Design;  
HRD – Highways Roads Design;  
M,GT&QC – Material, Geo-Technics and Quality Control;  
HPPP –Highways Public Private Partnership;  
HRSDT – Highways Roads Sector Development Team;

Figure 9: Ministry of Works Organizational Structure.



HZO – Highway Zonal Operations  
HSW – Highways South West;  
HSS – Highways South South;  
HNW – Highways North West;  
HNE – Highways North East;  
HSE – Highways South East)

HRM – Human Resource Management;  
HRM – Highways North Central;  
F&A – Finance & Accounts ;  
PRS – Planning Research & Statistics;  
PP – Public Procurement;  
EMS – Engineering Management Services;

ESLS – Electrical Street Lighting Services;  
CWE - Central Workshop & Equipment  
FERMA – Federal Road Maintenance Agency;  
OSGOF – Office of Surveyor General of the Federation



The principal objective of the project is the following;

- i. To reduce road transport costs along the road links supported by the project.
- ii. To introduce total asset management method for delivery and management of Federal roads also referred to as unity roads.
- iii. To plan and facilitate sustainable financing arrangement for the road sector.

The Federal Road Development Program (FRDP) comprise of three (3) components namely;

- i. Rehabilitation, upgrading and maintenance of Federal Roads
- ii. Institutional Strengthening and Policy Reforms
- iii. Road safety Components.

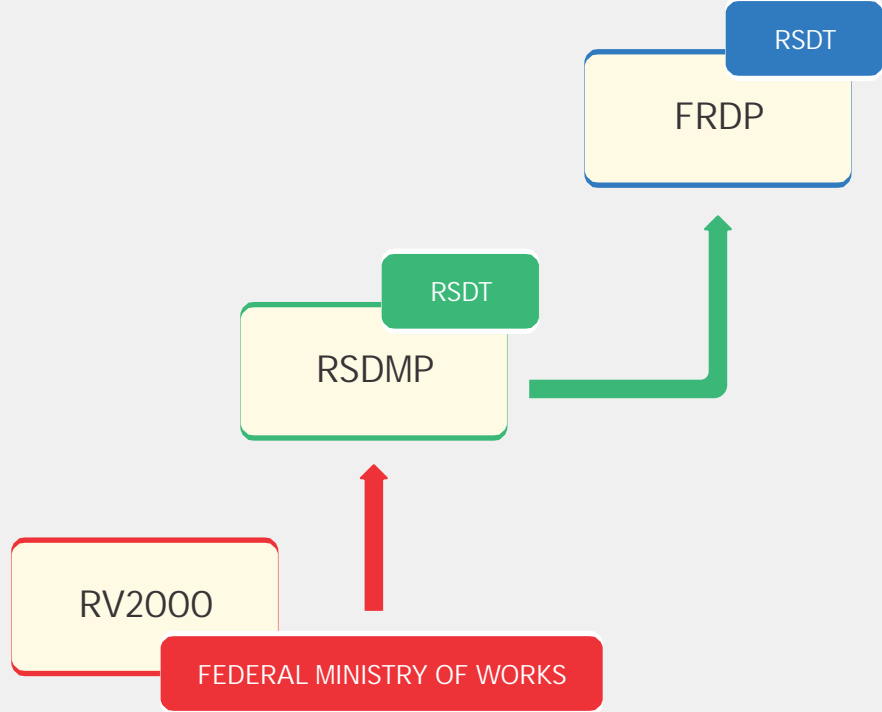


figure 10: Road Sector Program Transitions  
Model: Pison Housing Company.  
Source: Federal Ministry of Works, Abuja.

### Kano - Maiduguri Dual Carriageway

“ As a proactive approach, the ministry developed laudable policies to reaffirm its commitment towards elevating Nigeria's road infrastructure to a standard that will contribute immensely to rapid growth and development of the economy. ”



## 8.1 Strategy and Policy Initiatives

On assumption of Office, the Honourable Minister of Works, Arc. Mike Onolememen identified only a meager 30% of the Federal road network to be in fairly good condition while 70% remained in deplorable state and required immediate maintenance, rehabilitation, reconstruction and expansion efforts. In addition, the present administration also released a report<sup>11</sup> that states an inheritance a total of 160 on-going projects at various stages of completion with a total contract sum worth NGN 960bn.

Furthermore, the road sector faced with other constraints such as institutional and management problems had only two Highway Departments responsible for management of the entire Federal road network in the nation. As a proactive approach, the ministry developed laudable policies to reaffirm its commitment towards elevating Nigeria's road infrastructure to a standard that will contribute immensely to rapid growth and development of the economy.

In order to deliver the transformational agenda of the current administration in the road sector, some policy initiatives were introduced into the framework to guide the administration of road infrastructure development;

Further to the figure 11, the following highlights only an overview of some critical policies newly introduced into the road sector development. These policies are beginning to record tremendous success in the delivery of road infrastructure in Nigeria.



figure 11: Policy Initiatives by Federal Ministry of Works.  
Source: Pison Housing Company.



CMS - Victoria Island Link Road, Lagos.



1. The Ministry adopted a new paradigm described as “Strategic Highway Investment for Transformation (SHIFT)”. SHIFT was developed as a new plan to encourage public-private partnership in “GREENFIELD” projects. The SHIFT paradigm can be broken-down to the following components as depicted in the diagram below;

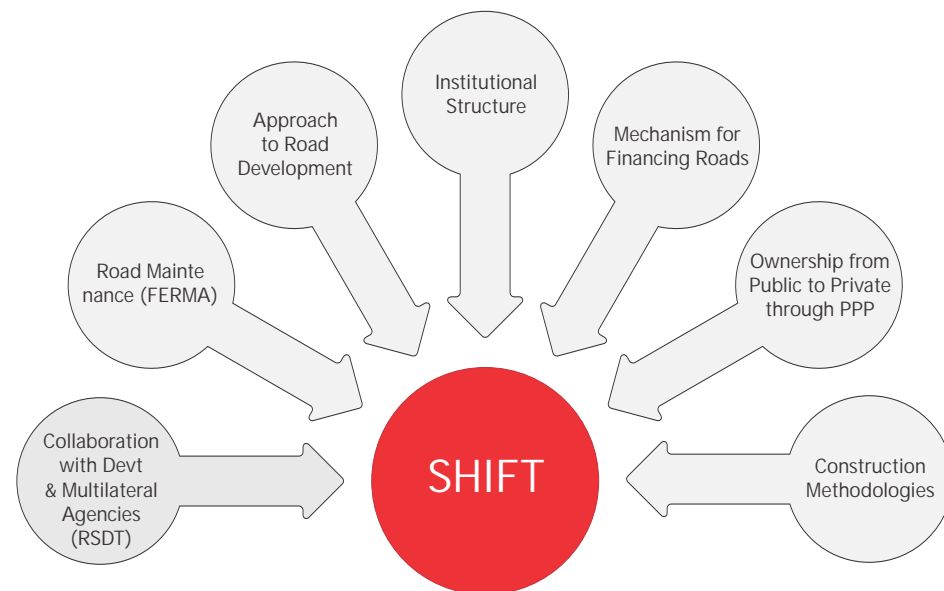
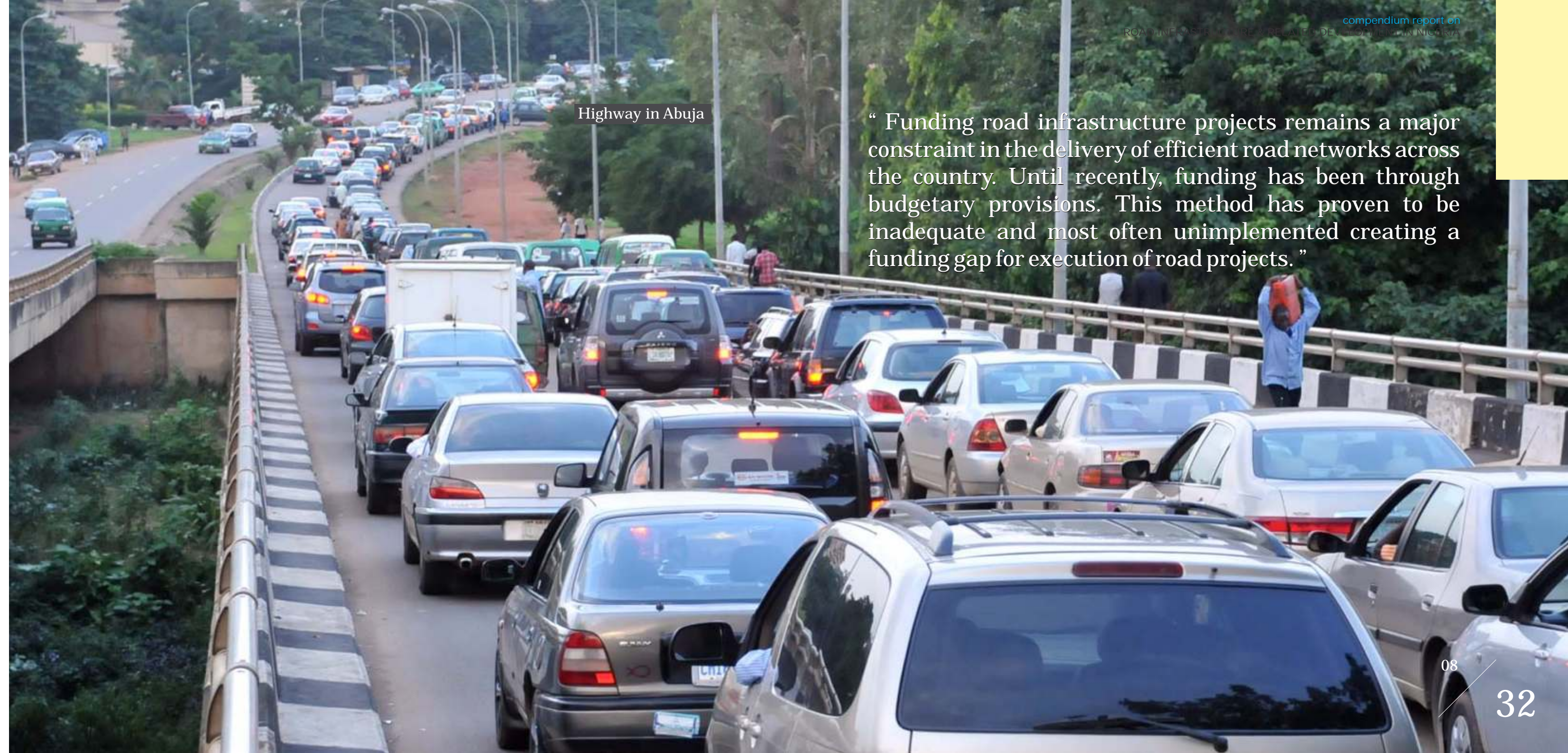


figure 12: Shift Paradigm by Federal Ministry of Works  
Source: Pison Housing Company

2. The Ministry adopted a BOLD approach in the development and improvement of the nation's Federal Roads network. The BOLD Approach, also an important component of the SHIFT paradigm involve the following:



Highway in Abuja

“ Funding road infrastructure projects remains a major constraint in the delivery of efficient road networks across the country. Until recently, funding has been through budgetary provisions. This method has proven to be inadequate and most often unimplemented creating a funding gap for execution of road projects. ”



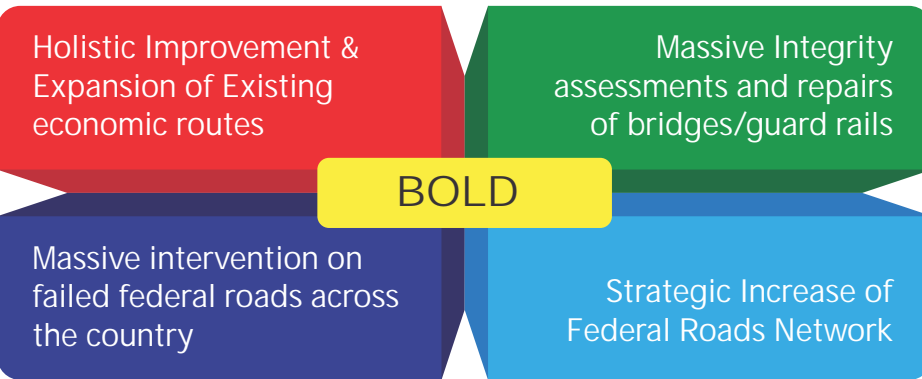


figure 13: "BOLD" Approach  
Source: Pison Housing Company

## 8.2 Road Infrastructure Finance Mechanism.

Funding road infrastructure projects remains a major constraint in the delivery of efficient and improved road networks across the country. Until recently, the funding of road projects has been through the budgetary provisions and executed by traditional method of direct contract award. This method has proven to be inadequate and most often unimplemented creating a funding gap for execution of road projects.

On an average, the annual funding requirement is estimated at NGN500b against an average budgetary allocation of NGN120bn with a deficit of NGN380bn. In 2012, out of the NGN143bn budgetary allocation for road infrastructure development only NGN110bn was released with deficit of NGN33bn unimplemented.

The deficit is evident to have negative consequences on the development of road infrastructure undermining national economic growth and causing loss of lives and properties across the country.

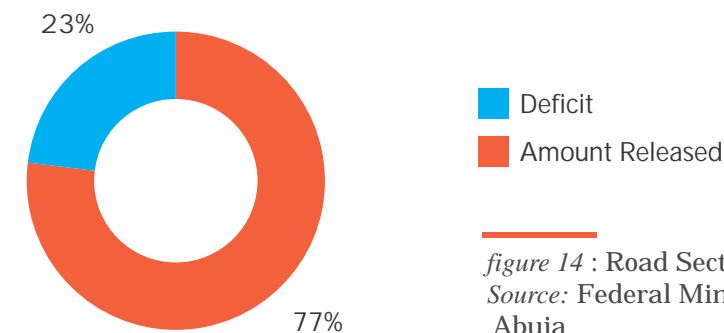


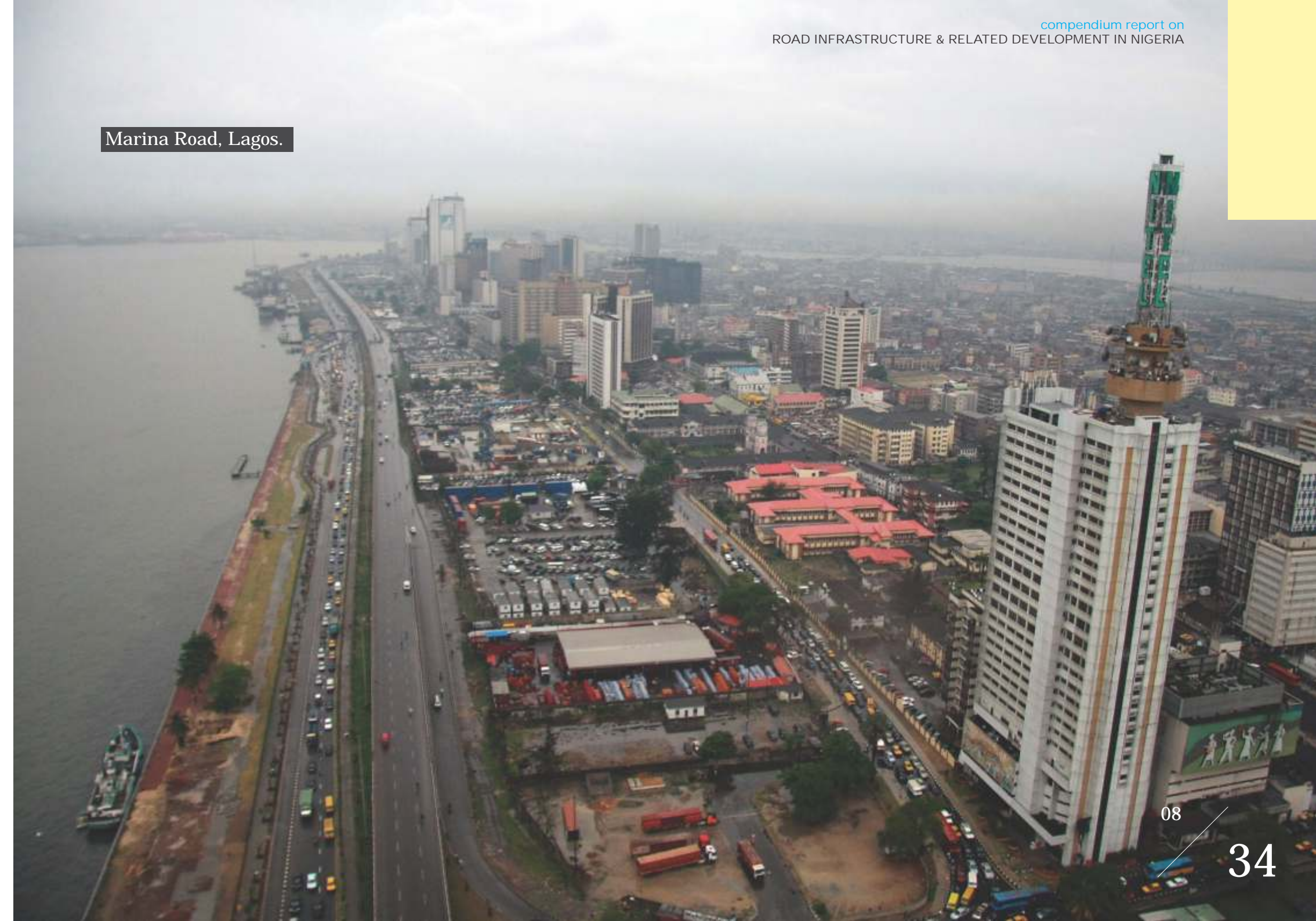
figure 14 : Road Sector Budget  
Source: Federal Ministry of Works  
Abuja

Against this background, reports<sup>12</sup> have further shown that Nigeria has the second highest road traffic accident fatalities among 193 countries in the world. The data available shows that Nigeria records 152 deaths for every 100,000 people, making road accidents the third highest killer in the country. The data further reveals that eighty per cent of injuries in Nigeria are traffic accident related. In the first half of 2012, the Federal Road Safety Commission put statistics for accidents at 1,936 fatalities<sup>13</sup> and substantial part of it is attributable to the poor state of our roads.

Furthermore, figure 15 shows the impact of decayed roads on the economy of the nation. Nigeria's economy loses whopping of NGN 175bn to deplorable road conditions across the country.

<sup>12</sup> Akintola K., (2012)  
<sup>13</sup> Ovuakporie E., (2012)

Marina Road, Lagos.





## CONSEQUENCES OF ROAD NETWORK'S DECAY

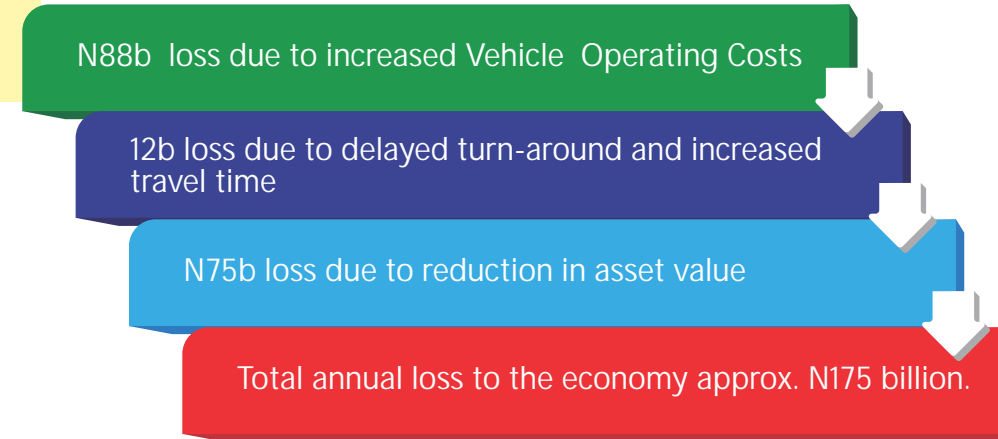


figure 15: Consequence of Road Network Decay  
Source: "Roads Vision 2000" - The loss calculated at 2.5% of GDP

Based on the diagram above, on account of only three road usage-related factors under consideration, the total annual loss to the economy is

### I. Conventional PPP finance for Road Infrastructure.

PPP or Public-Private Partnership or P3 describes a government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies (Obozuwa, 2011). Typically, one or more private sector companies form a consortium and are generally described as "Special Purpose Vehicle". The consortium may mainly consist of a project sponsor, Bank lender etc. Moreso, the consortium will be developed in a manner as to account for the technical, financial, legal, environmental and social aspects of the PPP transaction.

Considering the vast funding gap confronting the drive to deliver necessary road infrastructure development which is the primary ingredient for economic development, the Government is unable to meet

“ Government has taken bold steps to embark upon Public-Private Partnership initiatives geared towards tackling the current and impending challenges facing the development of the road infrastructure in the country.

In order to demonstrate its commitment towards this objective, the federal Government of Nigeria has further established the Infrastructure Concession Regulatory Commission (ICRC) through the ICRC Act of 2005.

The ICRC is the agency of the Federal Government of Nigeria responsible for catalyzing public private partnerships for the development and implementation of a world class PPP framework towards the development of a world class Brown-field and Green-field infrastructure projects for the benefit of Nigerians and the Nigerian Economy.”



up with the financial requirements of road infrastructure development. In this regard, Government has taken bold steps to embark upon Public-Private Partnership initiatives geared towards tackling the current and impending challenges facing the development of the road infrastructure in the country.

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The ICRC was enacted to serve as a regulatory and monitoring institution to provide an enabling environment for private sector players to participate in the provision of infrastructure while ministries, departments and agencies concentrate attention towards planning and structuring of projects. However the ICRC is not involved in the following;

- Project Initiation & Approval
- Determine Output Requirements
- Contracting Authority

#### Governance Structure of the ICRC

The organogram below depicts the structure of the commission;

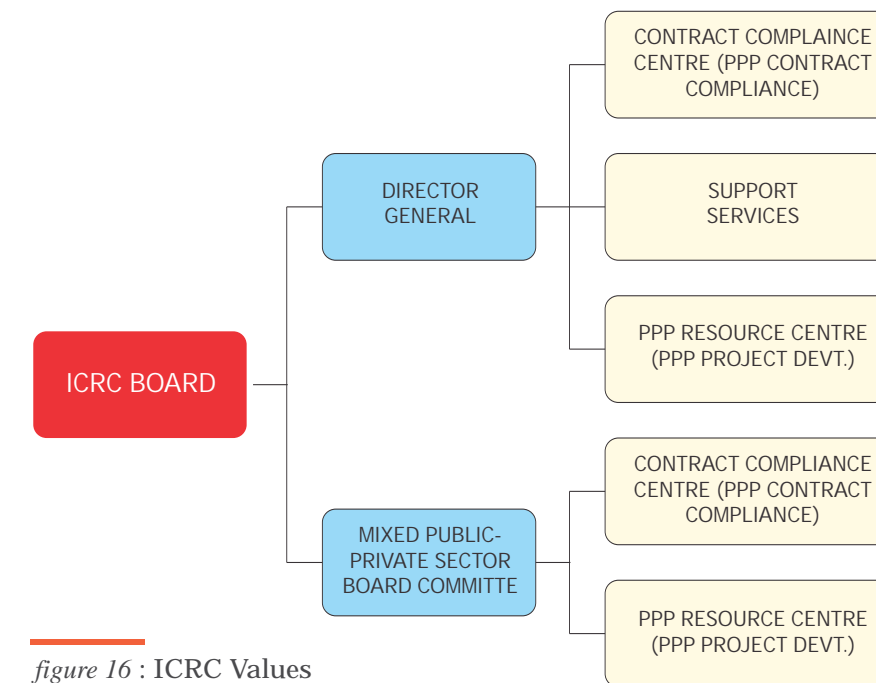


figure 16 : ICRC Values

Source: [www.icrc.gov.ng](http://www.icrc.gov.ng)

The following provides a summary of the role of ICRC in PPP arrangements.

- The ICRC and its governing board will regulate, monitor and supervise the concession and development projects and ensure that the transfer

of responsibility to private sector follows best practice and is achieved through transparent and open competition.

- The ICRC is responsible for establishing guidelines to promote, facilitate and ensure the implementation of Public-Private Partnership projects in Nigeria with the objective of achieving better value for money (VFM) and risk sharing between parties.
- ICRC empowered through the ICRC act 2005 seeks to provide the participation of the private sector in financing, construction, development, operation and maintenance of Federal Government infrastructure or development project through concession and contractual arrangements.

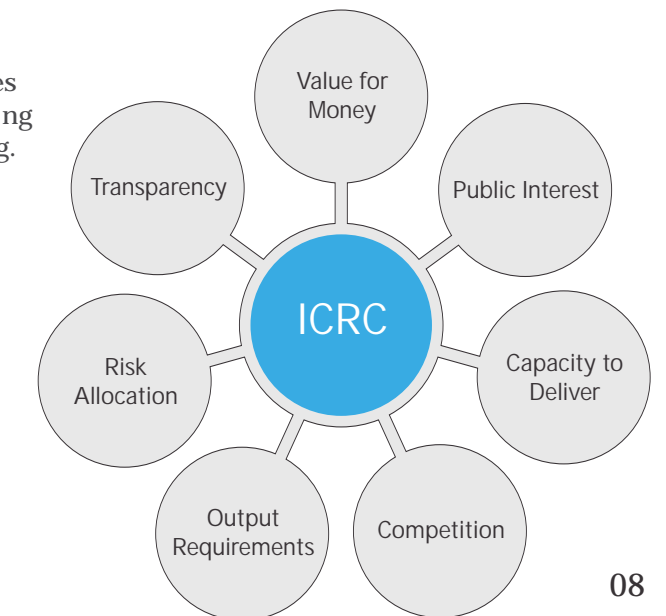
#### ICRC Principles And Value

The Key Principles and values being driven by ICRC for any PPP arrangement are depicted by the diagram below;

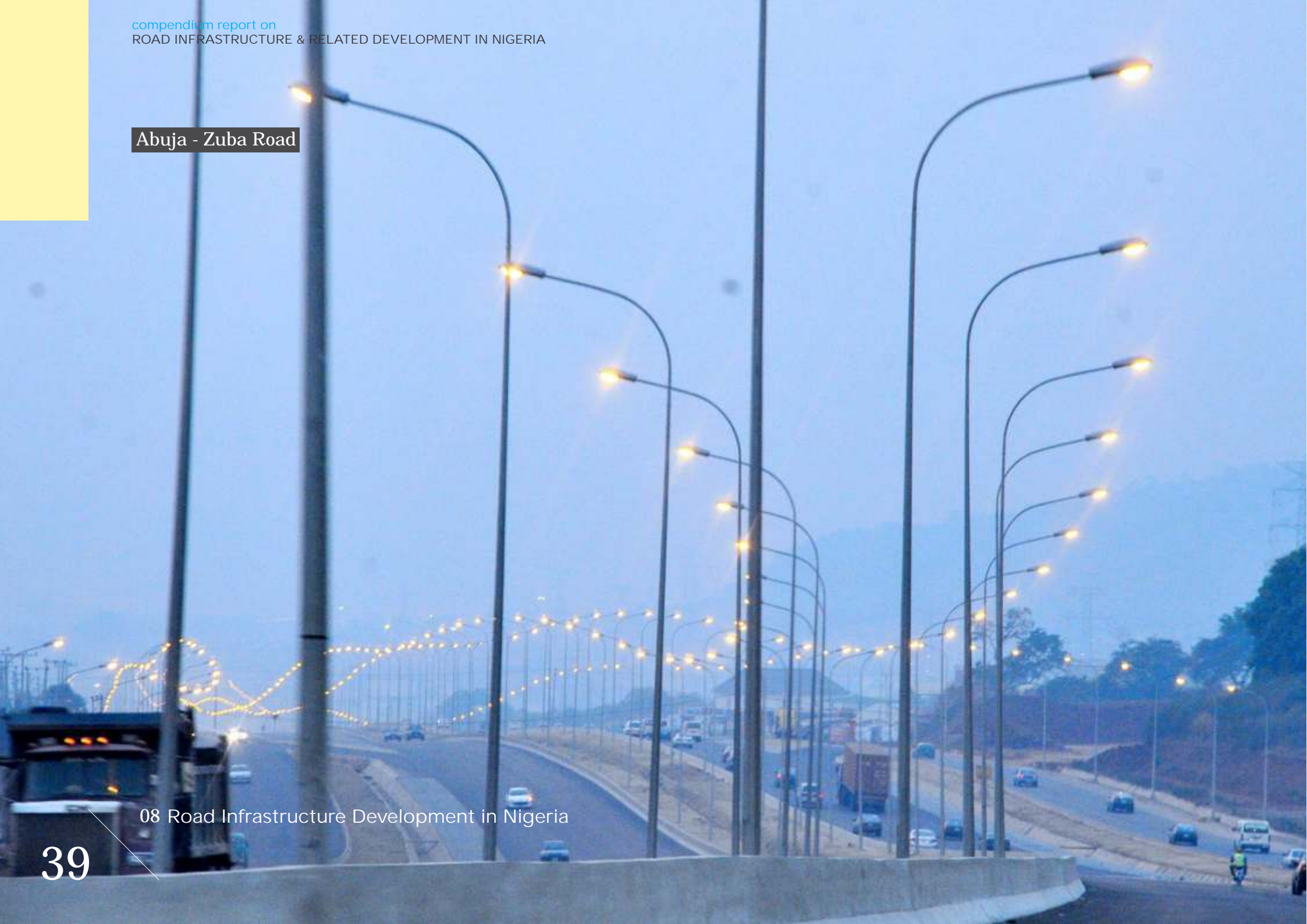
figure 17: ICRC Values

Source: [www.icrc.gov.ng](http://www.icrc.gov.ng)

Model: Pison Housing.







Abuja - Zuba Road

08 Road Infrastructure Development in Nigeria

### Models of Private-Public Partnership

The following are the models available for PPP transactions in Nigeria. These models have been developed using simple terms to provide clarity;

s/n	PPP Model	Description
1	Design-Build (DB) or Turnkey Contract	The private sector designs and builds infrastructure to meet public sector performance specifications, often for a fixed price. The cost of overruns is transferred to the private sector.
2	Service Provision Contract	A private operator, under contract, operates a publicly owned asset for a specified period. Ownership of the asset remains with the public entity.
3	Management Contract:	A private entity contracts to manage a Government owned entity and manages the marketing and provision of a service.
4	Lease and Operate Contract:	A private operator contracts to lease and assume all management and operation of Government owned facility and associated services, and may invest further in developing the service and provide the service for a fixed term.
5	Design-Build-Operate-Finance (DBFO):	The private sector designs finance and constructs a new facility under a long term lease and operates the facility during the term of the lease. The private partner transfers the new facility to the public sector at the end of the lease term.
6	Build-Operate-Transfer (BOT):	A private entity receives a franchise to finance, design, build and operate a facility (and to charge user fees) for a specified period, after which ownership is transferred back to the public sector.
7	Buy-Build-Operate (BBO):	The transfer of a public asset to private or quasi-public entity usually under contract that the assets are to be upgraded and operated for a specified period of time. Public control is exercised through the contract at the time of transfer.
8	Build-Own-Operate (BOO):	The private sector finances, builds, owns and operates a facility or service in perpetuity. The public constraints are stated in the original agreement and through on-going regulatory obligations.
9	Build-Own-Operate-Transfer (BOOT)	This is an extended version of the BOT model where the private sector builds, owns and operates a facility for a specified period as agreed in the contract and then transfers to the public.
10	Operating License	A private sector receives a license or rights to build and operate a public service, usually for a specified period. Similar to BBO arrangement.
11	Finance Only	A private entity, usually a financial services company, funds a project directly or uses a mechanism such as long-term lease or bond issue.

Table 2: PPP Models

Source: Obuzuwa, D. (2011).

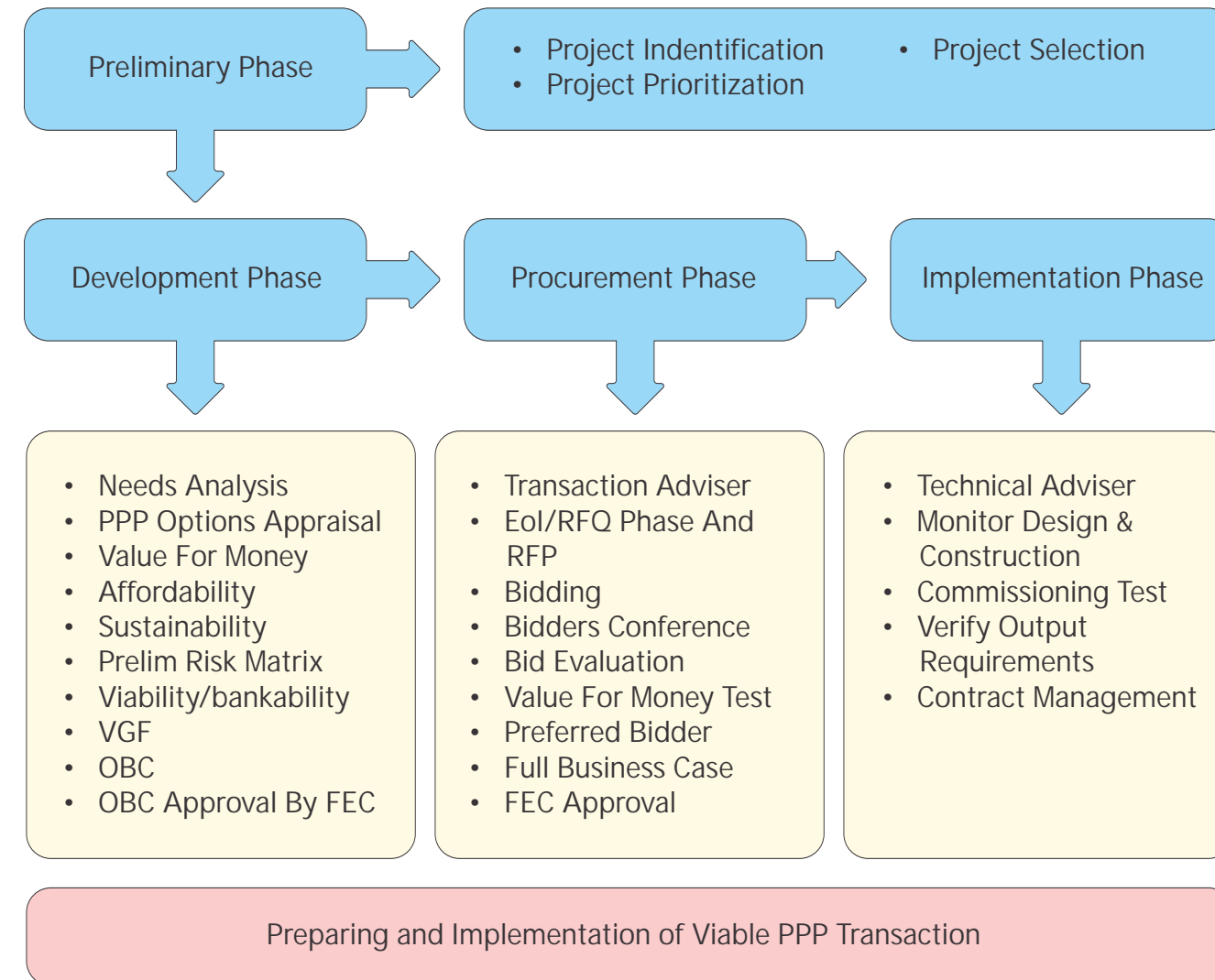
## PPP Life Cycle

The Diagram below provides a summary of the public private partnership life-cycle in line with the National policy on Public-Private Partnership ventures

*Figure 18: PPP Life Cycle*  
*Source: Federal Ministry of Works*  
*Model: Pison Housing Company.*

### KEY DEFINITIONS

VGF – Viability Gap Funding;  
EoI – Expression of Interest;  
RFP – Request for Proposal;  
OBC – Outline Business Cases;  
FEC – Federal Executive Council



PPP Transactions involve the following;

- Mobilizing private sector's money, expertise and capacities for infrastructure development;
- Long-term relationship between government and private sector (usually greater than 10 years);
- Sharing of Risks and Rewards with no lop-sided agreements – (privatizing the profits or nationalizing the loses);
- Private sector performs to agreed KPIs i.e. output focused;
- Life cycle focus on operations and maintenance;
- Public Projects with Private Investment not Private Projects with Public Facilitation;
- Internal Rate of Return (IRR) greater than Weighted Average Cost of Capital;
- Return on Equity (RoE) greater than Shareholders Requirement;
- Debt Service Cover Ratio greater than Bankers or Lenders Requirements;
- Loan Life Cover Ratio greater than Bankers or Lenders Requirements;
- Availability of Viability Gap Funding and FGN Capital Grant;
- Financial Intermediary Loan;
- Sovereign Wealth Fund (SWF) – Infrastructure Enabler Investments;

Key Benefits of the PPP for Private Investors

- Private sector will have ready access to secure long-term investment opportunities with relative certainty and security of

the Federal Government of Nigeria contract.

- Private sector partners involved in PPP transactions in Nigeria can achieve efficiency based on technical, financial and innovative capability.
- PPP facilitates expansion of business. Private sector partners can also expand their capacity and expertise in a particular sector. This can be leveraged on to create other business opportunities. E.g. any company can market its expertise or service in other areas of the economy, once it has established a track record of working successfully with the public sector in Nigeria.

Key Benefits to the Public Sector

- Maintaining Economic Stability - While the private sector focuses investments in the infrastructure development, there is no need for the government to take loans and pay interests. The implication of this is that less pressure will be exerted on the money market, thereby diminishing the upward pressure on interest rate and inflation.
- Gains from Private Sector Innovation and Expertise - Since the private sector is responsible for developing infrastructure, the most cost-effective and innovative means and technologies is employed without compromising value. This enables the best source of value for money gain.
- Logical Estimate of Expenditure during the Lifecycle of the



Infrastructure - The private sector promoters coordinate and implement different aspects of the project such as designing, financing, construction, maintenance, and management.

Therefore, it is possible to make logical estimate of expenditure during the lifecycle of the infrastructure.

- Achieving Desired Growth Rate - Desired growth rate cannot be achieved if the government is unable to invest in infrastructure development at the appropriate time. Participation of private sector allows additional investment and increased production capacity that feeds into higher growth rate.

## II. Viability Gap Funding.

The Federal Government of Nigeria has established a Viability Gap Fund to aid PPP infrastructure projects which face a viability gap owing to peculiarity of certain project e.g. For projects in which the traffic is expected to be insufficient to recover the expected investment, the government can provide a capital grant up to 40% of the project cost to meet the funding gap.

The long term plan is for the scheme to provides financial support in the form of grants, one time or deferred, to infrastructure projects undertaken through public private partnerships with a view to making them commercially viable. The long term plan is for the scheme to be administered through a proposed road fund managed by the proposed road board.

In order for PPP road project to be eligible for this method of financing, there are certain requirements that must be satisfied as below;

- The PPP project should be implemented, i.e. developed, financed, constructed, maintained and operated for the Project term by a Private Sector Company to be selected by the Government or a statutory entity through a transparent and open competitive bidding process.
- The criterion for bidding shall be the amount of viability gap funding required by the Private Sector Company for implementing the project where all other parameters are comparable.

## III. Adoption of Annuity contracts for key arterial routes;

Annuity Scheme is another format of BOT scheme, in which when the project cannot be implemented on BOT/ DBFOT basis (because of low revenue due to low traffic or high cost of Construction) but are important to construct for security reasons or for the development of the area are being implemented on Annuity basis.

In the annuity model the private concessionaire finances and undertakes the construction and maintenance of the highway and recovers its investment plus a predetermined rate of return from the annuity payments by the government or granting authority.

The annuity-based contracts are granted through a tender process in which the lowest annuity requested is used as a bidding criterion. The

## Oyo - Ogbomosho Dual Carriageway (Under Construction)

“ The Federal Government of Nigeria has established a Viability Gap Fund to aid PPP infrastructure projects which face a viability gap owing to peculiarity of certain project e.g. For projects in which the traffic is expected to be insufficient to recover the expected investment, the government can provide a capital grant up to 40% of the project cost to meet the funding gap.

The Viability Gap Funding Scheme provides financial support in the form of grants, one time or deferred, to infrastructure projects undertaken through public private partnerships with a view to making them commercially viable.”



“ The Federal Government of Nigeria is open to interested multilateral agencies who desire to tap into the opportunities within the road infrastructure sector of the economy. The sector promises tremendous rewards for investors who have the financial capacity, technical wherewithal and the institutional framework to do business with the Government of Nigeria. ”

Asokoro, Abuja

08 Road Infrastructure Development in Nigeria

granting authority retains the traffic risk, since it collects the toll revenues.

IV. **Borrowing from Multilateral Agencies and Pension fund for key Highways infrastructure**

The Federal Government of Nigeria is currently exploring this method of financing under the 10-year prioritized Road Sector Development Program (RSDP). The Federal Road Development Programme (FRDP) is the first step in the implementation of the RSDP currently managed by the Road Sector Development Team (RSDT) on behalf of the Federal Ministry of Works.

Currently, the funding for the FRDP is being supported by the following

S/N	Multilateral Agencies	Amount \$US Mil.
1	World Bank	330.00
2	Japanese Grant	3.00
3	Federal Government of Nigeria (Counterpart Funding)	32.00
4	Federal Government of Nigeria (Counterpart Funding)	17.82
5	Africa Development Bank (AFDB)	162.00
	Total	544.82

Table 3: Funding by Multi-lateral Agencies.  
Source: Federal Ministry of Works

The components of the FRDP for which the fund provides support are as follows;

- i. Civil Works
  - ✓ Rehabilitation
  - ✓ Upgrading, Strengthening & Periodic Maintenance
  - ✓ Consultancies
- ii. Institutional Strengthening and Policy Reforms
- iii. Road safety Component Improvements.

The Federal Government of Nigeria is open to interested multilateral agencies who desire to tap into the opportunities within the road infrastructure sector of the economy. The sector promises tremendous rewards for investors who have the financial capacity, technical wherewithal and the institutional framework to do business with the Government of Nigeria.

V. **Floating of Road Bonds for Highway projects**

Basic Concepts of Road Bonds

FGN road bond may be described as a written promise issued by the Federal Government of Nigeria to re-pay borrowed money on a definite schedule, usually at a fixed rate over the period of the bond. The moneys received will be channeled towards the development of Road infrastructure in the country.

Over the last 20 years, there has been a significant increase in the use of highway bonds as a mechanism of financing highway improvement across the world. For instance, in the United States of America, Massachusetts



became the first state employ this method of financing for highway purposes in 1893<sup>15</sup>. Hitherto, all but two states -- Nebraska and Wyoming - have issued highway bonds.

In Nigeria, with the urgent need for investment in road infrastructure improvements -- a need that greatly exceeds available financing, the Federal Government of Nigeria (FGN) has identified Road or Highway Bonds as an emerging option and a way forward for enhancing Highway Financing. The Bonds which will be issued in form of FGN bonds will assume similar characteristics as such. The road bonds will become debt securities (liabilities) of the Federal Government of Nigeria issued under the authority of Debt Management Office (DMO) and listed on the Nigerian Stock Exchange (NSE). The FGN is mandated to pay the bondholder the principal and agreed interest as they fall due.

Nature of FGN bonds

- Denomination: minimum subscription of NGN 10,000.00 + multiple of NGN 1,000.00 thereafter
- Yield: - Interest payment
  - ✓ Fixed interest rates: Majority of the FGN bonds possess fixed interest rates and paid bi-annually:
  - ✓ Floating interest rates: Some FGN bonds (e.g. 3<sup>rd</sup> & 4<sup>th</sup> tranches of the 1<sup>st</sup> FGN bonds) have floating rates of interest which fluctuates around a reference rate on the basis of specified parameters.
  - ✓ Availability of zero-coupon bonds whereby both interest and principal are re-paid at the final maturity date of the bond.

**“ In Nigeria, with the urgent need for investment in road infrastructure improvements - a need that greatly exceeds available financing, the Federal Government of Nigeria (FGN) has identified Road or Highway Bonds as an emerging option and a way forward for enhancing Highway Financing. The Bonds which will be issued in form of FGN bonds will assume similar characteristics as such. The road bonds will become debt securities (liabilities) of the Federal Government of Nigeria issued under the authority of Debt Management Office (DMO) and listed on the Nigerian Stock Exchange (NSE). The FGN is mandated to pay the bondholder the principal and agreed interest as they fall due.”**

The Regulators and Government Agencies in the FGN Bond Operation

S/N	Regulators/Agencies	Description
1	Debt Management Office (DMO)	DMO is the Agency authorized by statute to issue FGN Bonds on behalf of the Federal Government. The DMO also regulates the activities of the bond market and the Primary Dealer/Market Makers.
2	Central Bank of Nigeria (CBN)	The CBN acts as the issuing House and the Registrars for FGN Bonds.
3	The Nigerian Stock Exchange (NSE)	FGN bonds are listed and traded on the Floors of the Nigerian Stock Exchange
4	Central Securities Clearing Systems Ltd (CSCS)	Acts as the depository of the bonds listed on the Nigerian Stock Exchange. Investors who opted for physical certificates at the issue must have their certificates deposited in CSCS before transactions on them on the floors of the Nigerian Stock Exchange.
5	Security and Exchange Commission (SEC):	The apex regulator in the capital market; it regulates the activities of all operators as far as operations and their transactions in the market is concerned.

Table 4: Regulator and Government Agencies in FGN Bond Operation.  
Source: [www.dmo.gov.ng/hifb.php](http://www.dmo.gov.ng/hifb.php)

<sup>15</sup> Highway Bonds: “An Emerging Option for Increasing Highway Financing”, by Tom Howard



- Tenor: FGN bonds have a minimum of two (2) years investment period and maturities between 2 and 20 years, in issue. There are plans to have bonds with maturities above 20 years in the future.
- Default Risk: FGN bonds as a sovereign debt are the safest investment instrument. Default risk is nil. The Government always pays what is due to subscribers on the agreed date.

#### FGN Bond Operation Agencies

The agencies involved in the operation of FGN Bonds comprise mainly of regulators and government agencies. Essentially, this will provide potential investors with reliable information as regards agencies responsible for transaction of FGN bonds in the bond market. These agencies and their statutory responsibilities in the bond market have been outlined in the table 4;

#### Investor's Attraction to Road Bonds

- The FGN bonds as a sovereign debt is considered the safest of all investments in domestic currency securities market because it is backed by the “Full Faith and Credit” of the government. These type of bonds have no default risk, the implication is that it is virtually certain the interest and principal will be paid as and when due.
- The interest income earned from FGN (highway) bonds is exempt from state and local taxes. The savings incurred through state & local tax exemption affords investors to consider FGN bonds more than any other bond.



Abuja - Lokoja Road



- The attractive prospects of FGN bonds for the year 2013 was indicated by a strong run in second half (H2) of the previous year. Reports<sup>16</sup> by analysts suggests that the largest single driver in the year 2012 was an announcement of JP Morgan in August 2012 to add three FGN debt issues to its local currency government bond index in stages from 01 October 2013. Moreso, there are further plans for FGN bonds to be included in the comparable Barclays index with effect from March 2013.

Automatically, both developments are targeted at attracting foreign investors, most of whom would not otherwise accept Nigerian risk.

- According to a report<sup>17</sup>, the Nigerian economic landscape remains favorable to investment in high-yielding frontier markets. S&P raised its long-term foreign and local currency sovereign credit ratings of Nigeria to 'BB-' from 'B+', just 3 points below investment grade, Moreso, Moody's expanded its coverage to include Nigeria, assigning a 'Ba3' rating and Fitch

Ratings affirmed Nigeria's Long-term foreign and local currency Issuer Default Ratings (IDR) of 'BB-' and 'BB' respectively.

Noting some domestic positives. Inflation is set to fall, likely to single digits Year on Year (Y/Y) this quarter 2013. The naira exchange rate has stabilized. The monetary policy is accommodative across the developed world, and the avoidance of

the fiscal cliff in the US, if not definitive, means that risk is back "on" for traders.

As part of the road reform plan, the Federal Government of Nigeria, in a bid to improve road infrastructure delivery through alternative sources of highway financing, have made attempts to explore implementation of a five percent fuel surcharge of petroleum products.

## VI. Implementation of the 5% fuel surcharge

Following passage of the law since 2007, the implementation of the law is yet to be carried out owing to bottlenecks in the bureaucratic process. The proposed surcharge will go a long way to provide the required resources to fix existing dilapidated roads and construct new alignments across the nation.

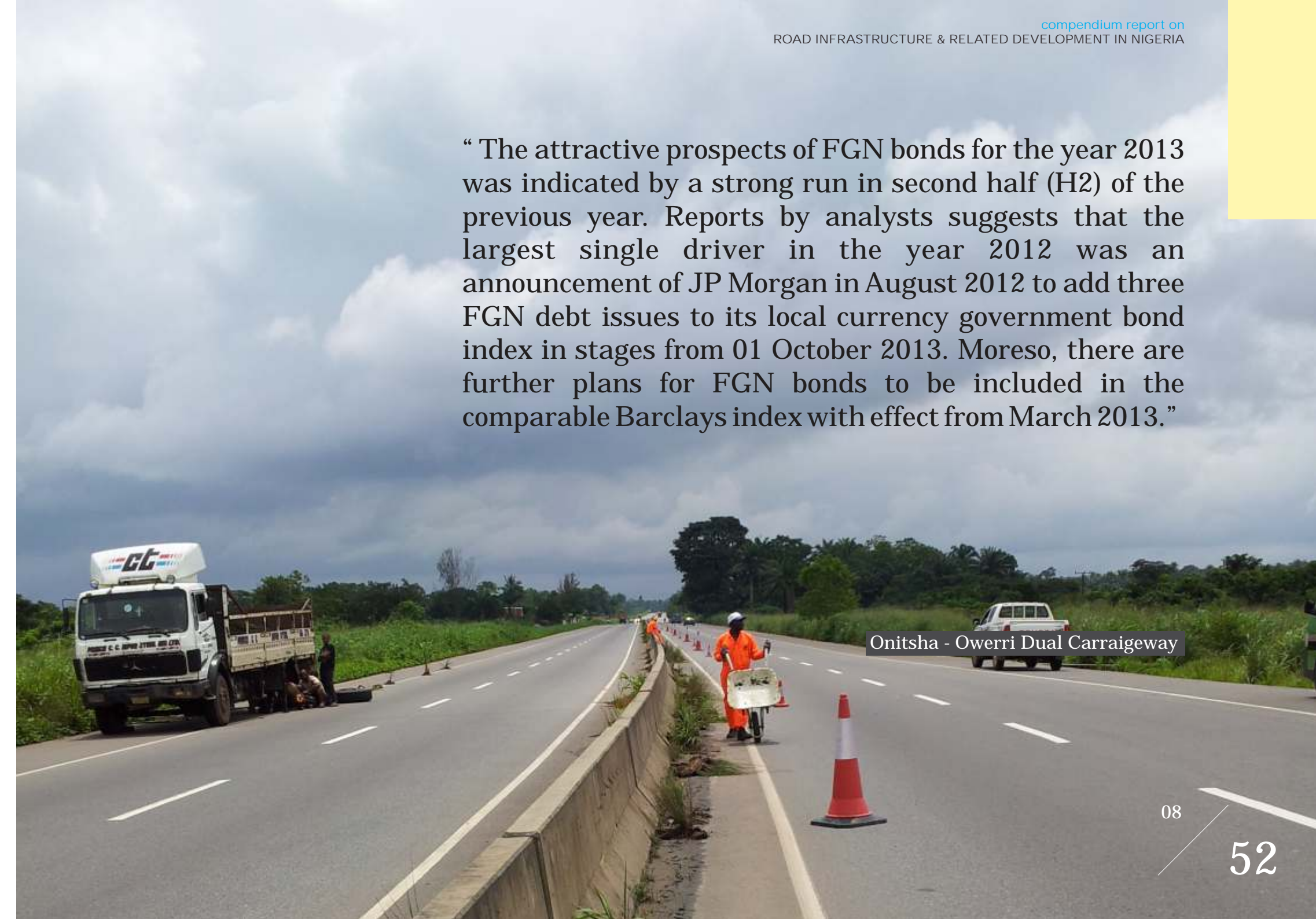
Based on the proposed arrangement, forty percent (40%) of the generated fund will be assigned to Federal Road Maintenance Agency (FERMA), while state governments are to share the remaining sixty percent (60%) for maintenance of state-owned alignments. However, state government who intend to benefit from the chunk of sixty percent (60%) will be required to establish a state road maintenance agency.

The introduction of this method of financing is nearing its concluding stages as final stages will involve disbursement of funds given that legislative laws have already been enacted.

<sup>16</sup> Egwatu P., (2013)

<sup>17</sup> Stanbic IBTC Asset Management Limited Quarterly Economic Review Q4:2012

“ The attractive prospects of FGN bonds for the year 2013 was indicated by a strong run in second half (H2) of the previous year. Reports by analysts suggests that the largest single driver in the year 2012 was an announcement of JP Morgan in August 2012 to add three FGN debt issues to its local currency government bond index in stages from 01 October 2013. Moreso, there are further plans for FGN bonds to be included in the comparable Barclays index with effect from March 2013.”



Onitsha - Owerri Dual Carraigeway



“ The Nigerian economic landscape remains favorable to investment in high-yielding frontier markets. S&P raised its long-term foreign and local currency sovereign credit ratings of Nigeria to 'BB-' from 'B+', just 3 points below investment grade. Furthermore, Moody's expanded its coverage to include Nigeria, assigning a 'Ba3' rating and Fitch Ratings affirmed Nigeria's Long-term foreign and local currency Issuer Default Ratings (IDR) of 'BB-' and 'BB' respectively. ”

River Niger Bridge, Onitsha, Anambra

08

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08

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## 9. Overview of Selected Road Infrastructure Projects in Nigeria

### 9.1 In-depth Analysis of Selected Road Projects

In line with the Federal Government's seven point agenda for the provision, operation and maintenance of infrastructure in the country, the Federal Ministry of Works has embarked on the concession of high traffic roads through the Public Private Partnership arrangements. Accordingly, the Government is taking steps for procurement of concessionaires to finance, design, construct, maintain and operate the roads.

In this context, the FMW through the Public Private Partnership unit has sought the services of reputable consulting firms or consortia to provide transaction advisory services throughout the PPP life cycle for these roads. Essentially, these advisory services comprise of conducting feasibility studies of some identified road alignments to ascertain feasibility studies on technical, legal, social, environmental and financial viability of the road projects for government partnership with the private sector investments. The results of these assessments have been compiled in a document described as Outline Business Cases. The Federal Ministry of Works has developed Outline Business Cases for viable and bankable major highways in the nation to attract private sector and foreign investments into the sector.

The methodology adopted in generating the Outline Business Case report is based on site investigation and data collection from socio-economic profile analysis, traffic surveys & forecasts, financial viability and other investigations in order to enable any investor make informed investment decision.

In line with the objective of this report, this section aims to showcase to investors the potential investment opportunities within some identified

road infrastructure projects with existing outline business case reports.

This section of the report provides an overview using analytical representation and brief discussions for reading convenience. However, comprehensive details of the various road projects are available and accessible through the individual Outline Business Case (OBC) reports.

A few of the road alignments that are being funded solely by the government are as follows;

1. Abuja-Kaduna-Kano
2. Shagamu-Benin-Asaba

Both roads are to be awarded in future for PPP under Operation & Maintenance model. In view of that, we have shown in this report the viability and feasibility of both alignments.

Other road projects which are available for private sector investment includes but not limited to;

1. Lagos-Iseyin-Kiishi-Kaiama
2. Kaiama-Bahama-Kaoje-Gwambu-Fokku-Sokoto

Project Title	Abuja – Kaduna-Kano Route
OBC Prepared by	SNC-LAVALIN International Inc./Yaroson Partnership Ltd.
Prepared for	Federal Ministry of Works, Public Private Partnership Unit
Road Type	378km (Abuja – Kaduna Section;166km, Kaduna – Kano Section; 212km) Four-lane Dual Carriageway Separated by Concrete New Jersey Barrier
Design Specification	Flexible pavement with;  - 150 mm lateritic sub-base; - 150 mm crushed stone base; - 60 mm asphaltic concrete binder; - 40 mm wearing course; - 560m minimum radius of curvature; - 5.5m vertical clearance; - Lane width - 3.65 m; - Existing Median width - Varies 10 – 20 m and New Jersey Barrier; - Paved Shoulder - 2.75 m outer shoulder and 15 m inner shoulder; - Carriageway width - 7.3 m Each carriageway; - Right of Way – 90m - Design flood frequency - 100 year return period; - Design Speed - 110 Km/h; - Posted Speed - 100Km/h; - Level of Service – B; - Design Vehicle - Interstate Semi – Trailer (Wb20); - Design flood frequency - 100 year return period;



Project Rationale

The proposal for improvement of the existing 4-lane carriageway includes provision of the following components;

Geometric Improvements; Widening Proposal; Service Roads; Side walk; Longitudinal Profile improvement; Improvement of Junctions; Bridge and Cross Drainage Structures; Special Problems and; Traffic Control and Safety Measures

Socio-Economic Profile Analysis

The Abuja – Kaduna - Kano road alignment is considered to be an important highway and lifeline for trade and commerce. The Abuja – Kaduna section stretches from the interchange within the Western bypass and ends at Rigachukwu in Kaduna State. While the Kaduna – Kano section starts from Rigachukwu in Kaduna State and terminating at the first roundabout inside Kano Township. The alignment is a popular route which traverses 12 localities from North-west geo-political zone and 16 localities from North-south geo-political zone connecting to the national seat of government, the nation's capital.

Apart from the political relevance of the Abuja – Kaduna - Kano route, it further provides a link for transportation of agricultural produce from the agricultural belt of the North-West and North-south, where both rain-fed and irrigated agriculture are most developed and practiced, to the Federal Capital Territory with its teeming population. The population of the localities in the Niger and Kaduna and Kano States traversed by the highway is estimated at 151,300 and 2,265,749 and 75918 respectively.

Therefore, any effort aimed at improvement of the route will catalyze growth and development of economic activities across the region. Citing the real estate sector as case study, one of such growth of activities is evident by the value to real estate development across the alignment. One of the critical factors that determine the value of any real estate property is the amenities available in proximity. One of such amenities is provision of road infrastructure. Typically, roads that provide access to communities and businesses for smart growth will increase property values. Roads that serve as barriers, or redirect traffic away from particular areas, will cause property values to fall.

Traffic Survey Analysis & Forecasts

An investigation of the traffic volume along these routes were conducted in order to establish the traffic flow characteristics, travel pattern, users' willingness to pay toll, economic and financial viability, junction improvements, road safety components etc. The projected traffic volume on the Abuja - Kaduna - Kano alignment plays a critical role in the private public partnership transaction as it determines to a large extent the technical and financial viability of the proposed investment.

The traffic survey of the Abuja – Kaduna - Kano route was carried out using;

- i. Automatic Traffic Count (ATC)
- ii. Axle Load Surveys
- iii. Origin-Destination surveys
- iv. Collection of Willingness to pay information.

Automatic Classified Traffic Count Survey

Automatic Classified Traffic Count Survey was carried out with the use of Metro Vehicle Classification System device - MC5600. The MC5600 is a simple axle-based pneumatic counter/classifier which collects data at a 'Time-Stamping'. The principle of operation of the device is such that every axle hit by the vehicle moving at least 10km/hr is being recorded at the time of hit by a pneumatic sensor. The recorded data is then interpreted by specialized computer software to give an output.

These studies were conducted at two selected regular count stations for twenty-four hours over a 7 day period along the length of the both sections of Abuja – Kaduna & Kaduna - Kano routes.

The table 5 represents the traffic volume data at two different count stations on each section of the route based on information on the annual average daily traffic (AADT) for motorized vehicles.

Abuja – Kaduna Section

Count Station	2 Axle - Cars, light, buses & pickups	2 - Axle	3 - Axle	4 - Axle	5 - Axle	6 - Axle or more
1	11600	1589	879	1539	372	436
2	12271	1552	927	1830	436	360

Table 5: Vehicular Count.  
Source: Federal Ministry of Works, Abuja

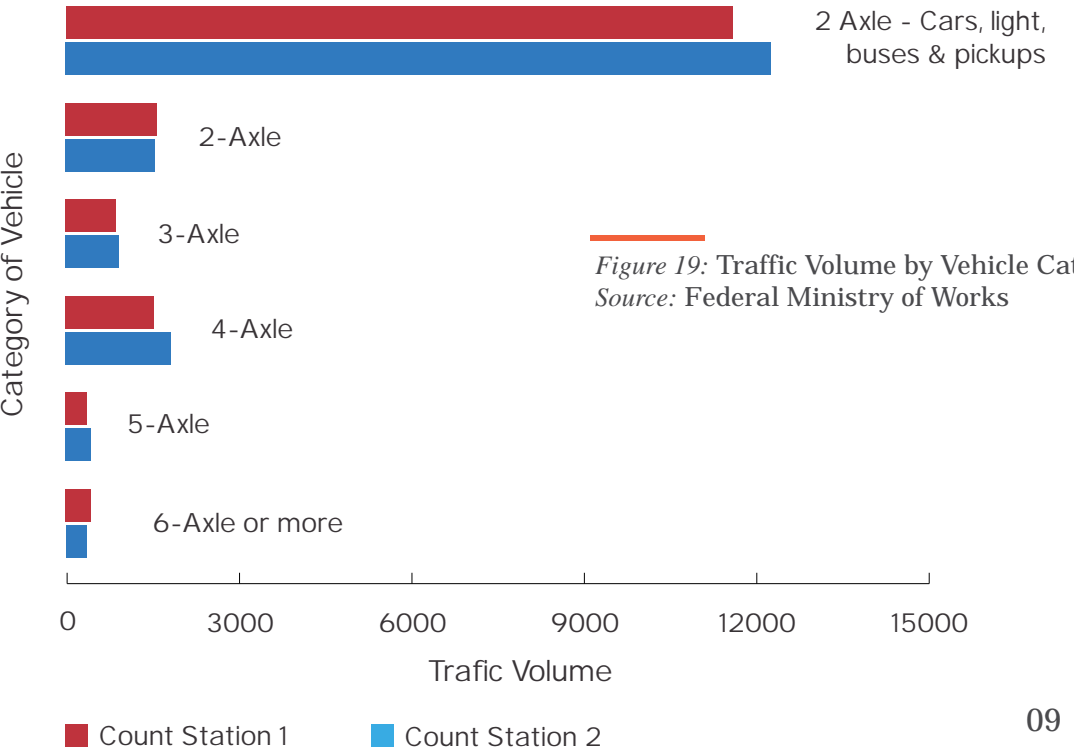


Figure 19: Traffic Volume by Vehicle Category  
Source: Federal Ministry of Works



Kaduna – Kano Section

Count Station	2 Axle - Cars, light, buses & pickups	2 - Axle	3 - Axle	4 - Axle	5 - Axle	6 - Axle or more
1	20666	1502	966	3171	868	1092
2	8307	926	624	2127	584	524

Table 6: Vehicular Count.  
Source: Federal Ministry of Works, Abuja

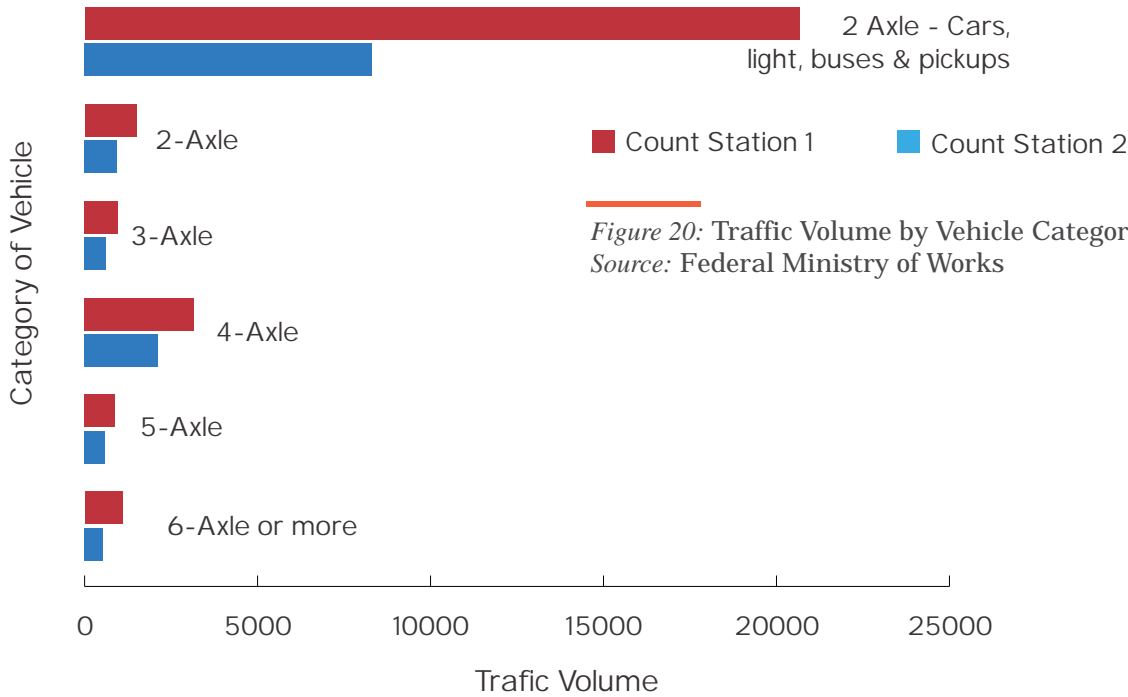


Figure 20: Traffic Volume by Vehicle Category  
Source: Federal Ministry of Works

From figures 19 & 20, it is therefore evident that the 2-Axle Cars, Light Buses & Pickups vehicles are the most prevalent category of vehicle travelling across for both sections of the alignment. More so, it can also be seen that the traffic volume for the Kaduna – Kano section is the lowest of both sections. The implication of the result obtained for Abuja – Kaduna section indicates that there are relatively more passengers and light weight freight movement across this section than the other Kaduna – Kano section. Therefore, there exists tremendous opportunities for real estate development such as motels, supermarkets etc given the high traffic flow of passengers and light weight freight movement.

Traffic Forecast

Table 7 represents the traffic growth rates for different categories of vehicles projected over a period till year 2030 based on the economic analysis. While the average growth rate used in the financial analysis of the road project was considered to be an average of 6.5%.

Traffic Growth Rates (%)

Vehicle Category		2010 - 2015	2016 - 2020	2012 - 2025	2026 - 2030
Passenger Transport	Car, Taxies Mini-, Light Buses Large Buses Motor Cycles	8.0	7.5	7.0	7.0
	2 Axle	7.5	7.0	6.5	6.5
Freight Transport	3 Axle 4 Axle 5 Axle 6 Axle and Above	6.0	5.5	5.0	5.0

Table 7: Traffic Forecast.  
Source: Federal Ministry of Works, Abuja.

Axle Load Survey

The axle load survey was conducted to determine Vehicle Damage Factor (VDF) / Equivalent Standard Axles from the axle load spectrum data which gives the damaging effect on pavements. The design and performance of the pavement is affected by a number of factors such as gross load, tyre pressure, number of wheels, wheel configuration and number of repetitions. The structural damage to the roads is determined by the type of vehicle expected to make use of the alignment during the life span of the route.

Origin – Destination (O-D) Survey

The O-D survey was conducted using 10-15 % sample size to determine the travel characteristics of freight and passenger along the route under study. The survey was conducted for 16 hours at two different locations along the alignment. The method of Roadside interview of randomly selected vehicles was adopted in the study to collect the following information;

- Origin and destination of trips, Trip time & purpose, Commodity type and pay load, and Frequency of trips



### Willingness to Pay

The toll rate and the traffic volume play a critical toll on the proposed road given that the route is to be built under a PPP arrangement. The analysis of the willingness of commuters to pay specific toll rate as they travel on improved roads was therefore sampled alongside the O-D surveys. The result from this analysis is depicted by the figure 21 & 22 for both sections of the Abuja-Kaduna-Kano.

Toll Rate Survey: Abuja - Kaduna Section

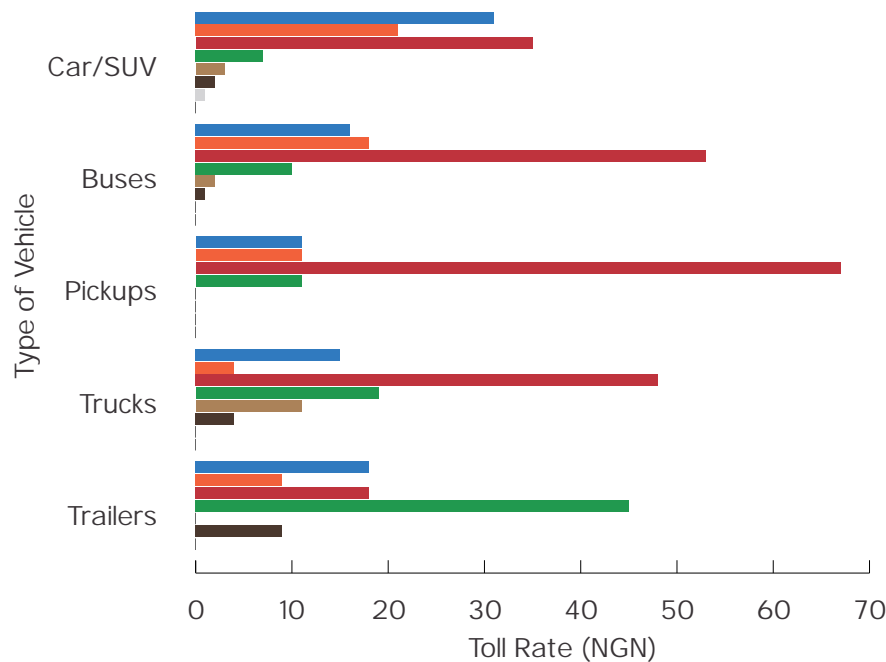


Figure 21: Toll Rates by Vehicle Type.  
Source: Federal Ministry of Works

Toll Rate Survey: Kaduna - Kano Section

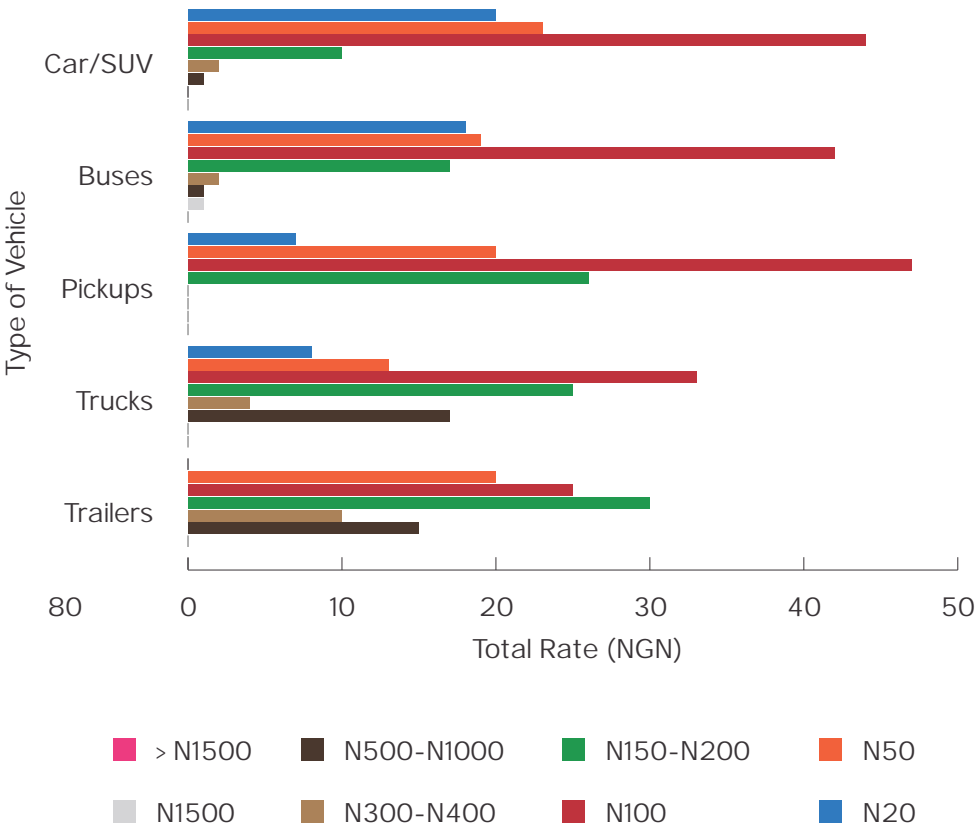


Figure 22: Toll Rates by Vehicle Type.  
Source: Federal Ministry of Works

From figures 21 & 22, it can be deduced that N100 toll fee was found to be the preferred toll fee by majority of the vehicle categories for both sections of the Abuja – Kaduna - Kano. A significant proportion of trucks and trailers have indicated preference for N150 – N200 toll rate. Clearly, the N1500 and above toll rate is observed to be the most unacceptable toll rates for both sections of the route.

However, these rates do not indicate the final toll rate as it only provides a guideline on the optimum rates for acceptability. The final toll rates are determined by the financial analysis of the project.

### Toll Rates Based on Financial Modeling

The base toll rates are to be increased @ 3% per year. Based on the financial analysis of the project, table 8 below gives base toll rates per km in 2010 and the projected effective rate per km in 2014 after increasing at 3% simple rate. Please note that these rates have been revised under a 12% inflation rate.

Base Toll Rates (N/Km)		
Vehicles	2010	2014
Cars, Van, SUV	2.00	2.26
Light Truck & Mini Bus	3.23	3.65
Large Bus/Heavy Truck	6.77	7.65
4-6 Axle	10.62	12.00
> 6 Axles	12.92	14.60

Table 4: Base Toll Rate  
Source: Federal Ministry of Works, Abuja





### Economic Analysis

The total construction cost of the Abuja – Kaduna & Kaduna – Kano sections of the road project based on the quantities generated from the design drawings and unit rates for different items of works are estimated at NGN 17,883,504,080.00k & NGN 20,072,275,860.00k respectively.

The economic evaluation of the project was carried out under a “Do Nothing/Do Minimum” and “With Project” conditions using HDM-4 software and projected over a period to year 2030. In conducting the investigation, a sensitivity analysis was also carried out to examine the likely impact of changing conditions on the results of the economic feasibility.

Table 8 represents the results of the sensitivity analysis on motorized traffic average annual daily traffic (MT AADT) and vehicle operating cost (VOC) for both sections of the alignment.;

Both sections of the road project is considered to be economically viable under the “Base Case” scenario, returning substantial Net Present Value (NPV) of NGN 229,933.38 & NGN 57,865.27 million, and Economic Internal Rate of Return (EIRR or IRR) of 70.1% & 32.3% respectively. These values are comfortably above the threshold of 12% discount and therefore can be considered for implementation.

### Financial Viability

According to table 10, the base cost for both sections of the road are estimated to be N 19,047.720 million and NGN 21,579.70 million calculated on 2010 prices when 2% toll equipment cost, 0.01%

Road Network in F.C.T. Abuja





		Abuja - Kaduna Sections		Kaduna - Kano Sections	
S/N	Sensitivity Scenario	IRR (%)	NPV at 12 % Discount (N' Millions)	IRR (%)	NPV at 12 % Discount (N' Millions)
1	Base Case	70.1	229,933.38	32.3	57,865.27
2	15% decrease MT AADT	63.2	188,873.83	26.6	36,95 5.37
3	15% reduction in traffic growth rate	67.9	201.655.12	30.0	44,266.81
4	15% increase in capital cost	65.4	227,607.89	29.5	55,230.66
5	15% reduction in MT VOC savings	65.8	201,923.04	30.0	49,852.75
6	15% decrease in MT time savings	68.9	221,124.12	31.4	54,576.15
7	All factors together	52.4	137,336.02	19.6	17,288.59

Table 4: Sensitivity Analysis.  
Source: Federal Ministry of Works, Abuja

Environment Management Programmes cost, utility shifting cost is 0.5%, supervision cost is 1% and physical contingency is considered 4% are added.

The Estimated Project Costs (EPC) of NGN 19,047.720 million & NGN 21,579.70 million represents the Total Project Cost (TPC) at current prices when escalation is considered as 12%, interest rate for Interest during Construction (IDC) is taken as 18.0% and 18.78% for sections 1 & 2

respectively, financial charges as 2% and expenditure phasing considered as 30%, 40%, and 30% respectively in 30 months of construction. The IDC has been estimated considering loan component 70% and full interest rate on current and past loan amounts taking cumulatively. The interest amount estimated on an annual basis.

The TPC estimation for sections 1 & 2 as shown by table 10.

Year	2010		2011		2012		2013		Total	
Sections	1	2	1	2	1	2	1	2	1	2
Total EPC Cost at 2010 prices	19,047.70	21,579.70	-	-	-	-	-	-	-	-
Distribution of EPC	-	-	5714	6474	7619	8632	5714	6474	19048	21580
EPC at current prices	-	-	6400	7251	9557	10828	8028	9095	23986	27174
Loan Amount @70%	-	-	4480	5076	6690	7579	5620	6367	16790	19022
Interest @ 18.0% & 18.78% for 1 & 2 respectively on current year debt	-	-	806	914	1204	1364	1012	1146	3022	3424
Interest on previous year Loan & Interest	-	-	-		952	1078	2373	2688	3324	3766
Total IDC	-	-	806	914	2156	2442	3384	3834	6346	7190
Financing Charges @2% on Debt	-	-	90	102	134	152	112	127	336	380
Total Project Cost	-	-	7296	8266	11847	13422	11525	13057	30668	34744

Table 10: Total Project Cost (TCP) Estimation.  
Source: Federal Ministry of Works, Abuja



### Key Assumptions

The assumptions that have been considered in financial analysis of this project are as follows:

- Project costs, toll rates and Operation & Management costs have been adjusted to current prices beyond 2010 prices at the rate of 12% discount per annum.
- Medical Aid post construction included in toll plaza costs
- Straight Line Method (SLM) and Written Down Value (WDV) depreciation methods have been used on book value of asset for income and tax estimation.
- 10% Written Down Allowance (WDA) depreciation has been considered.
- SLM rate (4.55%) estimated on the total period excluding construction period.
- 100% of book value of asset is considered for depreciation
- 30% tax rate has been considered.
- 7 years tax holiday has been considered.
- 10 years repayment period has been considered excluding 3 years construction period.
- The rate of interest has been considered as 18.0% per annum. Interest during construction has been capitalized.
- The debt-equity ratio has been taken as 70:30.
- One-time 2% enhancement of debt amount has been made to accommodate up-front and debt syndication charge.
- For the purpose of financial analysis 2-wheelers, auto, agriculture trailer and NMT have been excluded.
- The construction phases are 30%,40% and 30%

- 12% has been take as average inflation rate
- Toll rate indexed @7.8 % [threshold 3% + 40% of Wholesale Price Index (WPI) (12%) each year]
- The discount rate for Net Present Value (NPV) has been taken as 12%.
- Concession period is 25 years including 3 years construction spell.
- Routine maintenance cost has been taken as N 0.5 million per km
- The periodic maintenance in case of flexible pavement is considered N 40 million/km
- The cost of insurance is considered 0.01% of project cost at 2014 prices per section.
- No concession fee is considered
- It has been assumed that financial closure will be completed within stipulated time period.
- No revenue shortfall loan has been considered
- No construction of additional toll-way has been considered
- It has been assumed that there will be no change of law loaded with cost hike implications.
- 30% of project cost as Equity support has been considered
- Toll efficiencies for car 80%, bus 85%, LCV 85% and truck 85%
- Toll charge for overloaded and evasive traffic not considered
- Project IRR has been estimated taking project cost without the equity support of the Government. This equity support as contribution from government is not a cost to the concessionaire.
- Project IRR has been estimated against NET OPERATING INCOME
- Equity IRR has been estimated against NET CASH FLOW
- Maximum govern support is 40% in form of grant during construction/maintenance
- The value of Debt-Service-Coverage Ratio (DSCR) ideal value is 1.3:1.5

### Kano By-pass





Abuja – Kaduna Section

Options	Govt. Support (%)	Percentage change from Basic Toll rate (N2/km)	Percentage income from other sources	Project IRR (%)	Equity IRR (%)	NPV (N'Million)	DSCR
Options 1	0	0	0	13.5	12.74	3196.57	1.01
Options 2	0	0	5	14.55	14.15	6717.67	1.14
Options 3	5	0	5	15.02	14.67	7676.36	1.2
Options 4	25	0	5	17.26	17.78	12583.71	1.52
Options 5	0	0	40	17.31	17.65	16384.18	1.36
Options 6	30	0	0	16.75	17.08	10340.52	1.44
Options 7	0	35	0	16.88	17.1	14789.04	1.34
Options 8	0	25	10	17.1	17.38	15586.61	1.36
Options 9	5	20	10	17.12	17.44	14986.03	1.38
Options 10	5	20	5	16.58	16.74	13071.88	1.36
Options 11	0	25	5	16.56	16.69	13592.7	1.33

Table 11: Option Analysis.  
Source: Federal Ministry of Works, Abuja

Ongoing Construction of Two Bridges Along Auchi - Agebeode Road in Edo State.





Kaduna – Kano Section

Options	Govt. Support (%)	Percentage change from Basic Toll rate (N2/km)	Percentage income from other sources	Project IRR (%)	Equity IRR (%)	NPV (N'Million)	DSCR
Options 1	0	0	0	16.35	16.43	14586.29	1.33
Options 2	0	0	5	16.93	17.16	16961.88	1.35
Options 3	5	0	0	16.85	17.09	15893.76	1.37
Options 4	0	5	0	16.93	17.16	16961.88	1.35

Table 12: Option Analysis.  
Source: Federal Ministry of Works, Abuja

Financial Evaluation Results

However, even though the project is good for implementation, the results of the financial analysis for 25 years indicate that both sections of the project is unviable without augmentation from government /toll rate hike/ income from other sources.

In view of this, the public private partnership unit of the Federal Ministry of Works would make recommendations based on the feasibility studies (OBC) conducted by transaction advisers for the government to provide viability gap funding (VGF) to secure the interest of private sector investors. These supports are required to make the project financially

viable on PPP basis Project could be made viable by Viability gap fund method

Findings of Financial Analysis

Based on the financial analysis in the table 12 above, the project road is financially viable under options 8 & 4 respectively.

Obiozara Uburu Road, Enugu State





Project Title	Shagamu – Benin - Asaba
OBC Prepared by	Roughton International/ Allot Nigeria
Prepared for	Federal Ministry of Works, Public Private Partnership Unit
Road Type	384km (Shagamu – Benin Section; km, Benin - Asaba Section; km) Four-lane dual carriageway separated by barrier
Design Specification	Overlay design on existing flexible pavement with;  - 300 mm hardcore/sub-base; - 200 - 300 mm crushed stone base; - 60mm - 100mm bituminous binder; - 40 mm bituminous wearing course; - 200mm of filter stone - Two layers of bituminous macadam 100mm – 200mm

Socio-Economic Profile Analysis

The Shagamu–Benin-Asaba with an existing dual carriageway of approximately 384km stretches from the west, the main junction in Shagamu town, Ogun State through the south and terminates at the start of Niger Bridge, south of Asaba. The route traverses four states namely Ogun, Ondo, Edo and Delta states as project influence areas. According to an estimated 2009 census<sup>18</sup>, the four states made up of a population of 15.4 million people which accounts for about 10% of the entire country. Along this route, there are approximately four major interchanges (Lagos-Ibadan, Benin bypass entry, Auchi road Benin bypass, and Benin bypass exit), 30 minor intersections and considerable number of informal and track access routes.

The 2007 income assessment data<sup>19</sup> available as at the time the Outline Business Cases for the Shagamu-Benin-Asaba alignment were prepared suggests that the GDP per capita for the four project states is 50% higher than the national average (US\$1670). According to this report, amongst the project states, Delta state has the largest GDP per capita of over US\$5,000 with values approximately twice the national average. This is best explained by the oil exploration and production activities within the state.

The key activities occurring within the project states help to reinforce the significance of the alignment to the economic wellbeing of the country. In delta state, oil exploration and production is pre-dominant, timber extraction, milling and processing is pre-dominant in Edo and Ondo states, gold and some minerals deposits are abundant in the former. Widespread amongst the four project states are the following; building materials manufacturing (i.e. aggregates quarry and winning), light

<sup>18</sup> National Population Commission  
<sup>19</sup> Canback Global Income Distribution Database and National Bureau of Statistics

industrial activities such agro-processing and chemicals. The pre-dominant activity across the majority of the economically active project areas is farming. Therefore, the alignment will serve as an important route for transportation of these agricultural goods and services from any of the states to other locations accommodated within the route.

Moreso, the Shagamu-Benin-Asaba alignment is considered as one of the most significant highway and lifeline for trade and commerce between western and eastern part of Nigeria. The route is very popular for heavy traffic flows particularly during festive periods. The lack of maintenance of the route has resulted in its decay transforming the road into a major destination for road-user casualty.

Traffic Survey Analysis & Forecasts

The traffic survey is a vital tool for assessment of income predictions and hence financial viability of the PPP transactions. For the purpose of analysis, the total length of the road was divided into two sections during studies to investigate varying features along the alignment such as traffic level, cross section, surface conditions and rehabilitation requirement peculiar to each section of the alignment.

- Section 1- Shagamu junction – Benin bypass and
- Section 2 - Benin bypass – Asaba bridge

An investigation of the traffic volume along these routes were conducted in order to determine traffic flow characteristics, travel pattern, users' willingness to pay toll for improved travel conditions, income predictions etc. The traffic survey of the Shagamu-Benin-Asaba road was carried out



using the methods of Roadside Interview (RI), Manual Classified Counts (MCC), Highway Inventory, Stated Preference (SP),

Roadside Interview (RI) & Manual Classified Counts (MCC)

The RSI and MCC methods were employed to examine the existing travel pattern for both sections of the alignment for a 12-hour period. Details of these methods have been discussed earlier in the report except for the slight changes in measuring conditions. The road side interviews were conducted at 15 locations throughout the study area. The results of this traffic counts are presented in figure 23 below in the report.

Observed Count

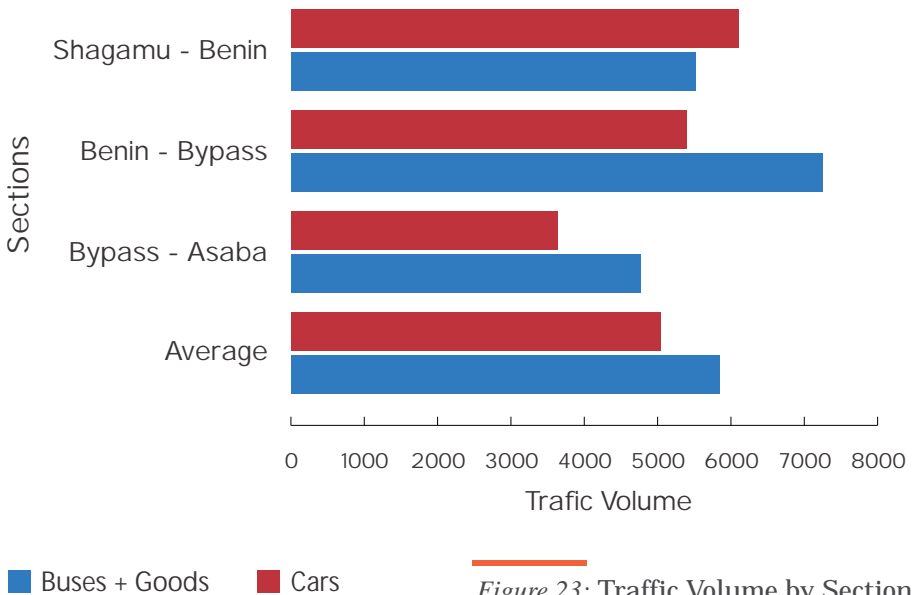


Figure 23: Traffic Volume by Section.  
Source: Federal Ministry of Works

The results from the observed traffic count showed an average of 5,045 and 5,845 for cars and Buses & Goods vehicle category across the three define sections of the Shagamu – Benin – Asaba alignment for 12 hours. Extrapolations to the average annual daily traffic against the optimum toll rate for each category of vehicle from the financial analysis will provide only a guide as to the income predictions along the alignment. The financial viability of the route is discussed in the outline business case (OBC) for the route. This OBC is available for interested investors.

Highway Inventory (HI)

The HI survey was employed to acquire data required to build the road network. The results obtained were used to determine characteristics of a link connecting any two junctions along the alignment. The characteristics includes route descriptions (one-way or two-way route), average speed of traffic on the each link etc. the results were used to build a highway network which was checked and corrected using the global positioning system, detailed digitized map of the road network and inventory data.

Stated Preference (SP)

The SP survey was employed to determine the traveler's value for time, an important parameter to measure the willingness of road users to pay toll for improved travel conditions. The data obtained from this survey was inputted to SP analyzer to give co-efficient of

Abakiliki-Afikpo Road, Ebonyi State

“ The results from the observed traffic count showed an average of 5,045 and 5,845 for cars and Buses & Goods vehicle category across the three defined sections of the Shagamu – Benin – Asaba alignment for 12 hours. The financial viability of the route is discussed in the outline business case (OBC) for the route. This OBC is available and only applicable for interested investors under the future operations and maintenance PPP model. ”



toll perception, in-vehicle time and cost.

The results show that the value of time saved is N8.9 per minute which is comparable higher than values obtained from other route. The value of time save is approximately four times that of Lokoja and Makurdi bridges (N2.1 per minute) and twice that of Port Harcourt (N4.9 per minute). The overall analysis reveals that the high quality toll road is perceived by drivers to be attractive and worth the equivalent of saving 27.5 minutes of their travel time.

#### Traffic Model Comparison

The results of all the investigations conducted were used to build a traffic model using convergence analysis. The results of the traffic model were found to compare well with the data obtained from the observed count for a 2-way trip.

#### Traffic Demand Forecast

The model was further applied to analyze the appropriate toll rate to be applied to the toll road and found to be N25 per km optimum toll rate. This toll rate was also verified in comparison with the outcome of the toll rate based on economic analysis.

Moreso, the model was also used to determine the growth in traffic on the toll road under the low (3%), medium (5%) and high (8%) scenarios. These assumptions were made for gross domestic

product growth rates based on a constant 2.2% population growth at intervals throughout the concession period from the year 2012 to year 2036.

The table 13 below presents the growth domestic product growth rate assumptions.

Annual Growth Rate		Growth Factors			
GDP Growth (%)	Population Growth (%)	2012	2019	2026	2036
3	2.2	1.1081	1.5871	2.2731	3.7974
5	2.2	1.1515	1.887	3.092	6.261
8	2.2	1.2183	2.4315	4.8528	13.0239

*Table 13: Growth Domestic Product (GDP) Growth Rate.*  
*Source: Federal Ministry of Works, Abuja*

Figure 24 presents demand daily (24hrs) traffic forecasts and expected revenue along the Shagamu – Benin & Benin – Asaba sections of the alignment for all vehicles including cars, buses & goods at interval within the period under study.





Annual Daily Traffic Forecasts for Shagamu - Benin Road

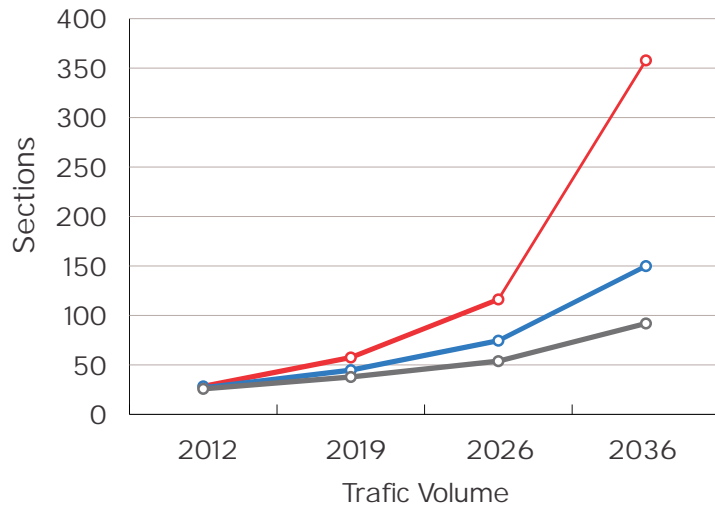


Figure 24: Traffic Forecast  
Source: Federal Ministry of Works

Based on the analysis as shown above (figure 24), it can be seen that under the 3%, 5% & 8% scenario, the model predicted 45,000, 46,000 and 49,000 vehicles which generates an income of N25.8 million, N26.8 million and 28.3 million respectively at the start of the concession.

At the end of the concession, the income expected to be generated are N91.9 million, N149.9 million and 357.8 million by 161,000 and 265,000, and 609,000 vehicles respectively under the respective scenarios.

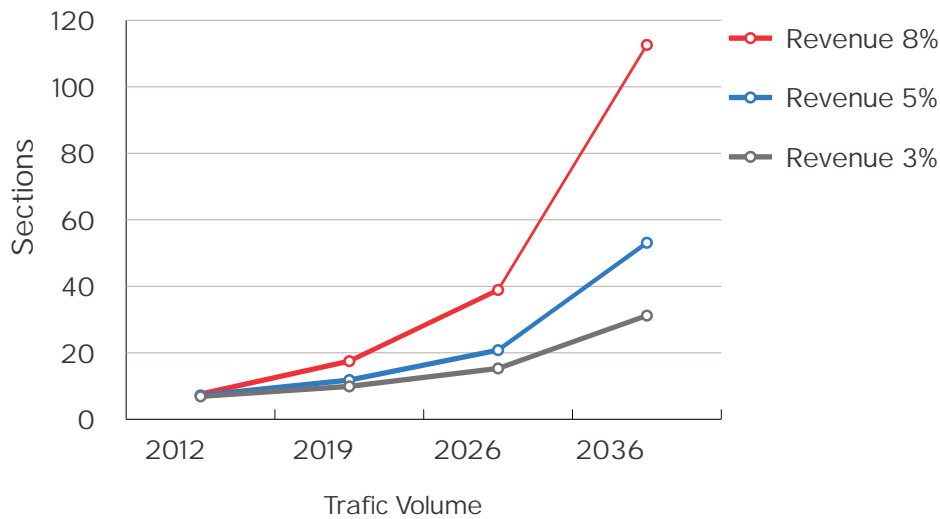


Figure 25: Traffic Forecast  
Source: Federal Ministry of Works

Based on the analysis as shown above (figure 25), it can be seen that under the 3%, 5% & 8% scenario, the model predicted 27,000, 39,000 and 31,000 vehicles which generates an income of N6.9 million, N7.2 million and N7.6 million respectively at the start of the concession.

At the end of the concession, the income expected to be generated are N31.2 million, N53.1 million and N112.6 million by 120,000 and 211,000, and 112,600 vehicles respectively under the respective scenarios.

Road Maintenance by FERMA





### Economic Analysis

The economic analysis was restricted to appraisal of private costs and benefit in economic terms. The primary objective of the analysis is to provide justification for the economic cost of traffic using the road under three different toll regimes in comparison with the cost of using the road before re-construction. As before, the HDM-4 software was used to investigate the road user costs within a particular period.

The result of the economic appraisal for both sections of the road project indicates that the N5 per km toll appear to be the most favorable toll regime and hence yields the optimum economic results.

### Financial Analysis

The financial analysis for the Shagamu – Benin – Asaba alignment was conducted based on the traffic generated for the 3%, 5%, and 8% growth rates for growth domestic product and the following basic assumptions;

- Government will provide 5% & 50% of the total construction cost as grant for Shagamu - Benin and Benin – Asaba sections respectively to be treated as “zero return” equity to SPV;
- The private shareholders will provide investment of 10% of the total cost of construction as equity on each section of the alignment;
- From above, the outstanding 85% & 40% for Shagamu – Benin & Benin – Asaba sections in the form of US dollar denominated debt;
- Concession period of 25 years;

- 8% interest on long term debt with 2 year repayment holiday period;
- 20% minimum return on equity;
- 30% corporate tax rate;
- 5% VAT rate;
- Upgrading and construction period: 2 years with spending plan: 1<sup>st</sup> year – 55% and 2<sup>nd</sup> year 45%;
- 98% toll collection efficiency;
- Local traffic does not pay toll.

Based on the Outline Business Cases (available from the PPP office of the Federal Ministry of Works) for Shagamu – Benin & Benin – Asaba sections of the Shagamu – Benin – Asaba alignment, the results of the financial analysis indicate that the project would yield the required returns under the 5% and 8% growth scenarios (as shown in the traffic demand forecast) with government contributions of 5% & 50% of the total upgrading and construction costs as zero return equity to the SPV for Shagamu – Benin & Benin – Asaba sections respectively.

The ensuing section of the report will discuss available road alignments for PPP.

Project Title	Lagos - Badagry - Kaiama
OBC Prepared by	Sanol Engineering Consulting Ltd/Voyants Solutions PVT. Ltd.
Prepared for	Federal Ministry of Works, Public Private Partnership Unit
Road Type	Proposed 11 sections with a total of 631km 2 & 4-lane carriageway separated by median
Design Specification	Improvement Proposal;  New construction @ Sections1 & 3 – 7 for 4-lane carriageway; Rehabilitation With Wearing Course And Binder Course @ Sections 2 & 8-11 for 2-lane carriageway  Proposed pavement composition;  - 230 mm sub-base course; - 150 mm thickness base course base; - 60 mm thickness binder pavement; - 40 mm thickness wearing course; - Paved Shoulder – 1.5m – 2.0m; - Carriageway width – 6.0m - 7.3m; - Right of Way – 100m i.e. 50m on either side



Project Title	Kaiama-Babana-Kaoje-Gwambu-Fokku-Sokoto Road
OBC Prepared by	Sanol Engineering Consulting Ltd/Voyants Solutions PVT. Ltd.
Prepared for	Federal Ministry of Works, Public Private Partnership Unit
Road Type	Proposed 11 sections with a total of 631km 2 & 4-lane carriageway separated by median
Design Specification	<div>Improvement Proposal;</div> <div>New construction @ Sections1 &amp; 3 – 7 for 4-lane carriageway; Rehabilitation With Wearing Course And Binder Course @ Sections 2 &amp; 8-11 for 2-lane carriageway</div> <div>Proposed pavement composition;</div> <div><div>- 230 mm sub-base course;</div><div>- 150 mm thickness base course base;</div><div>- 60 mm thickness binder pavement;</div><div>- 40 mm thickness wearing course;</div><div>- Paved Shoulder – 1.5m – 2.0m;</div><div>- Carriageway width – 6.0m - 7.3m;</div><div>- Right of Way – 100m i.e. 50m on either side</div></div>

Socio-Economic Profile Analysis

The Kaiama-Babana-Kaoje-Gwambu-Fokku-Sokoto road with a proposed length of 631km starts from the Kaiama roundabout and ended at the roundabout at the entrance of Sokoto town. Along this route is one of the major terminals for international business route between Shaki in Oyo state of Nigeria and Parakou in Benin Republic.

An approximate 337.4km of the existing road is a bush track without pavement. The route comprise of 11 sections of individual alignment from beginning to the end. The alignment traverses 14 major junctions connecting federal and state arterial roads and 50 minor junctions earmarked under a separate improvement plan.

The road project under study have been ear-marked for widening and strengthening of the single / intermediate / two /four-lane road to be carried out in PPP scheme.

Traffic Survey Analysis & Forecasts

The traffic survey of the Kaiama-Babana-Kaoje-Gwambu-Fokku-Sokoto route was carried out using the same methods adopted in the analysis of previous road projects. These methods have been discussed extensively in prior sections of this report. However, differences in measuring conditions are outlined in presenting results of the analysis.

The results from the investigation into the average annual daily traffic volume are depicted by figure 26 for both east and west bound sections of the alignment under study.

Traffic Survey Analysis By Count Stations

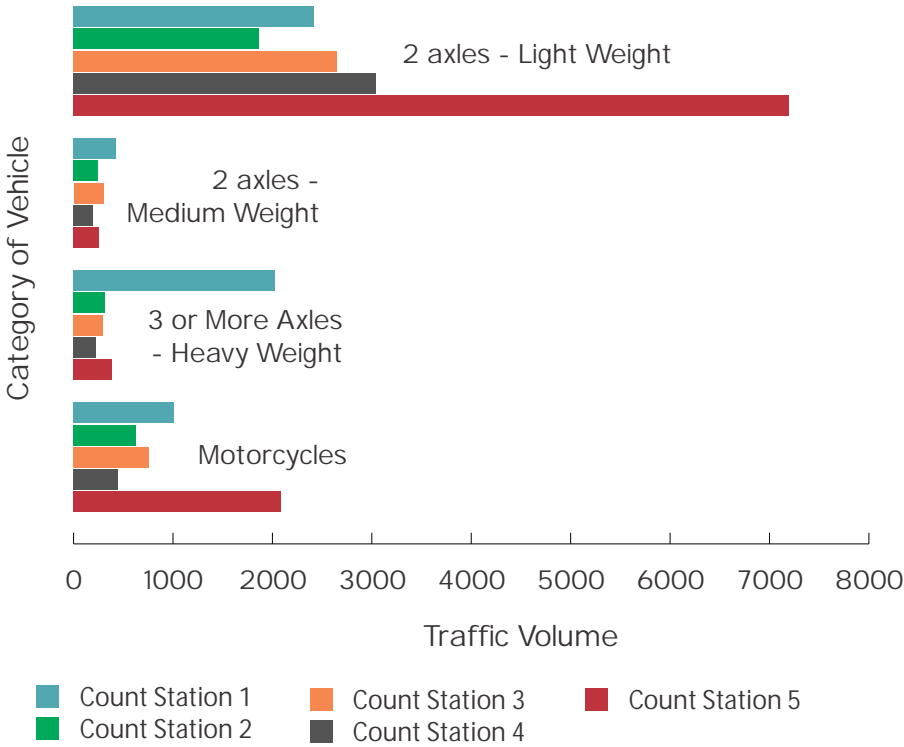


Figure 26: Traffic Volume by Vehicle Category.  
Source: Federal Ministry of Works



### Traffic Survey Analysis By Count Stations

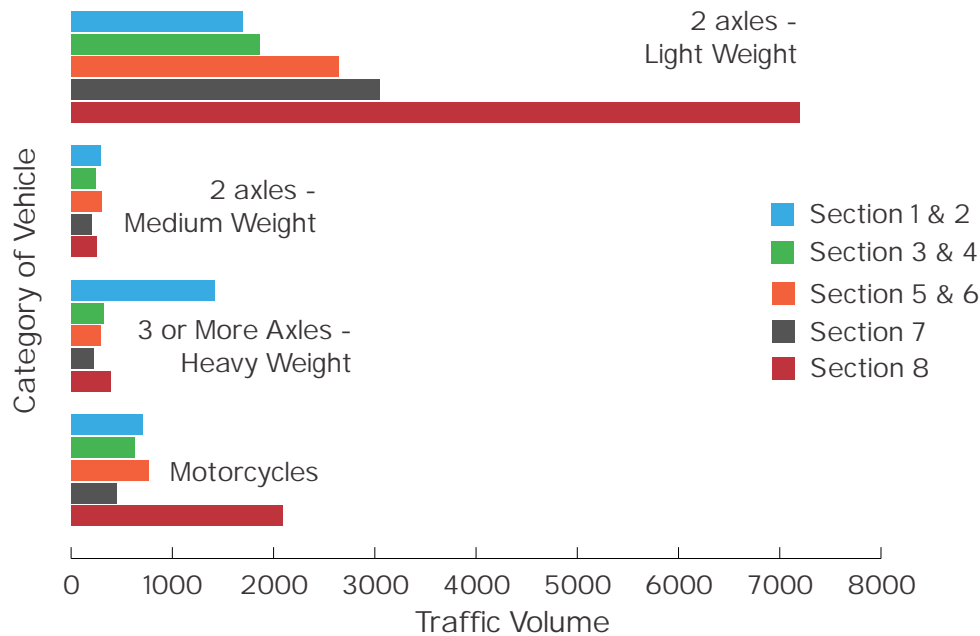


Figure 27: Traffic Volume by Vehicle Category.  
Source: Federal Ministry of Works

### Traffic Forecast

The projected Average Annual Daily Traffic growth rates for the different categories of vehicles examined under three different scenarios are represented by figure 28;

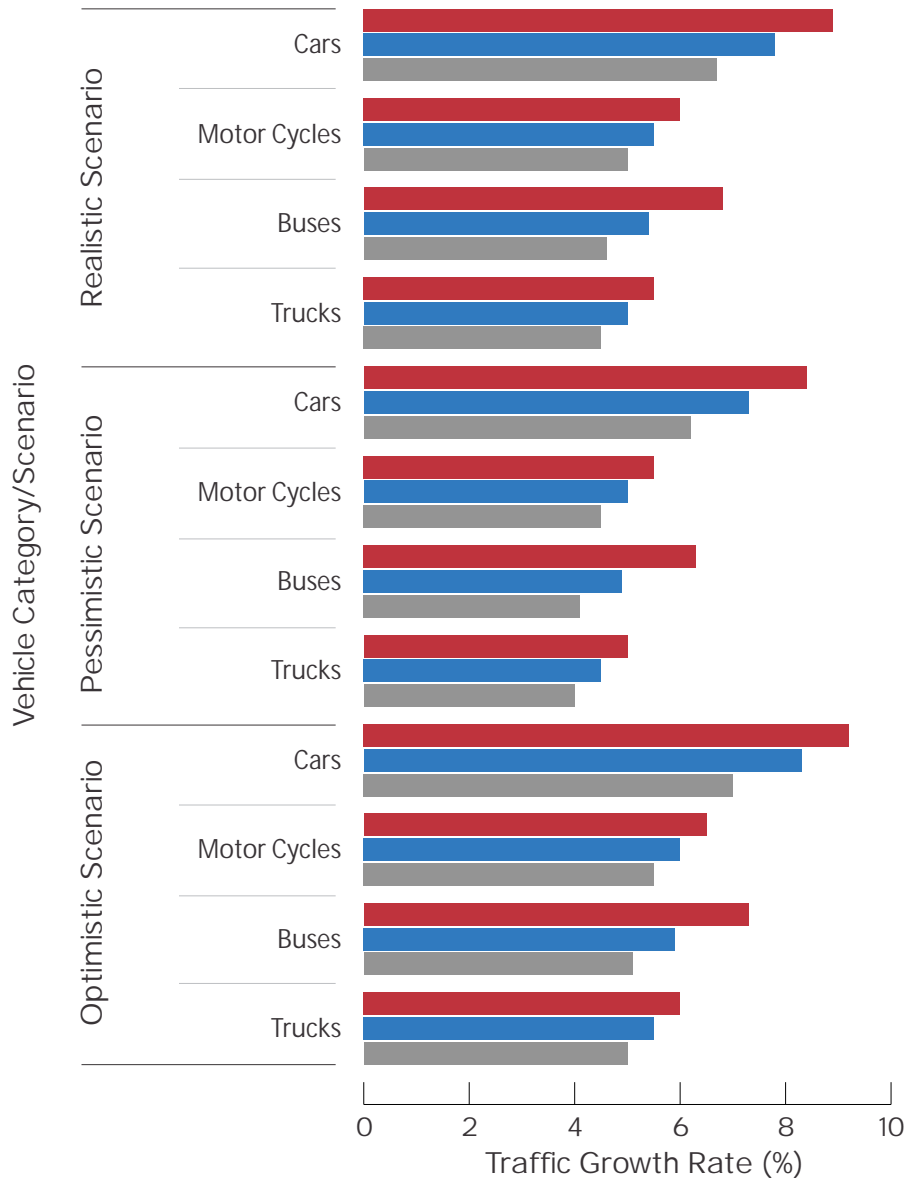


Figure 28: Vehicular Traffic Growth Rate by Scenarios  
Source: Federal Ministry of Works

### Financial Evaluation

The financial analysis of the road project under study was investigated using all potential sources of income. The primary purpose was to determine the possibility of sustainable returns through the life-span of transaction period in order to satisfy the requirements of potential investors.

### SYNOPSIS OF OTHER ROAD INFRASTRUCTURE PROJECTS ALSO AVAILABLE FOR INVESTMENTS

#### Enugu-Port Harcourt Road Description:

Nigeria has a strategic location and size which has resulted in four routes of the Trans-African Highway network using the national road system, and the Enugu-Port Harcourt road is part of these four routes.

The Enugu-Port Harcourt expressway is from the NNPC Mega Fuel Plaza outside the city of Enugu and ends at Eleme junction, 10Km after the Imo River at the boundary of the city of Port Harcourt. The Port Harcourt-Enugu expressway is part of the A3 Federal Road that serves the East as well as the North East of Nigeria through Benue State crossing the Benue River at Makurdi. It passes through Rivers, Abia and Enugu States.

The Enugu-Port Harcourt road is a major road in the South-South zone of Nigeria<sup>20</sup>. The road is a major one for business people and traders, which is the most operative occupation in the south-south region of the country. It is the key route for over 80% of trucks. Currently, truck travel time takes

over 10 hours due to the bad road conditions. A reconstruction of the road will enhance travel time between the two locations to an average of 5 hours. Driving distance from Expressway, Port Harcourt to Independence Ave, Enugu is approximately 232 km or 144.2<sup>21</sup> miles. Special lanes can also be built for trucks so they are focused on particular paths.

The road takes estimated 12,000 – 30,000 vehicles, both ways, daily. If the road is fixed, this traffic has the potential of increasing to 70,000 vehicles daily. For returns of investment, sustainability and maintenance, a toll will be introduced. This will divert some vehicles to alternative competing routes, but the vehicles that will divert will be approximately 60%, and this still leaves a sizable number that will utilize the toll.

#### Project Strategy

Analyzing the renovation of the Enugu – Port-Harcourt dual carriageway examines the technical, economic and financial feasibility of renovating and managing the route through a PPP method. Port- Harcourt has the second largest port in Nigeria, and Enugu – Port-Harcourt road is a very significant highway in the country. It was built in the 1980s and it passes through several states and connects to the main road that goes on to Maiduguri which is in the northern part of the country.

The south is mainly a petroleum processing area and the middle-belt to northern area is essentially the food processing part of the country. The road connects these areas, facilitating business in raw materials, food, petroleum products, goods and people. Renovation and maintenance of this road will enhance economic activities along the route and ultimately boost the nation's economy.

<sup>20</sup> <http://thenationonlineng.net/new/editorial/letters/insult-called-enugu-port-harcourt-expressway/>

<sup>21</sup> <http://www.gomapper.com/travel/what-is-the-driving-distance-from/port-harcourt-to-enugu-enugu.html>



## Abuja - Lokoja Dualization Road Project



### Policy Framework

A PPP structure for the renovation of the Enugu – Port-Harcourt road can easily be facilitated and implemented as backed by Nigeria's Vision 20:20:20. The private sector is authorized to instill and manage the development of infrastructure in the power and transport sectors.

The Federal Ministry of Works currently manages Federal Government roads. Intervention, partnership and management by the private sector will enhance maintenance of the roads.

#### Traffic Forecast

- Traffic Count 1(Route 1): Km 5 position from Enugu town
- Traffic Count 2(Route 2): Km 85 position from Enugu before Okigwe town
- Traffic Count 3(Route 3): Km 116 Position from Enugu in Umuahia town
- Traffic Count 4(Route 4): Km 145 Position from Enugu in Aba town
- Traffic Count 5(Route 5): Km 195 Position from Enugu in Port Harcourt town

As an average on all sections, the traffic along the route is distributed as follows:

- 10% category 1 (pedal cycle, tricycle and motor cycle)
- 71% category 2 (car, station wagon, pick-up, jeep, minibus)
- 5% category 3 (lorry, truck, petro tanker)
- 14% category 4 (tractor trailer, tractor tanker, bus)

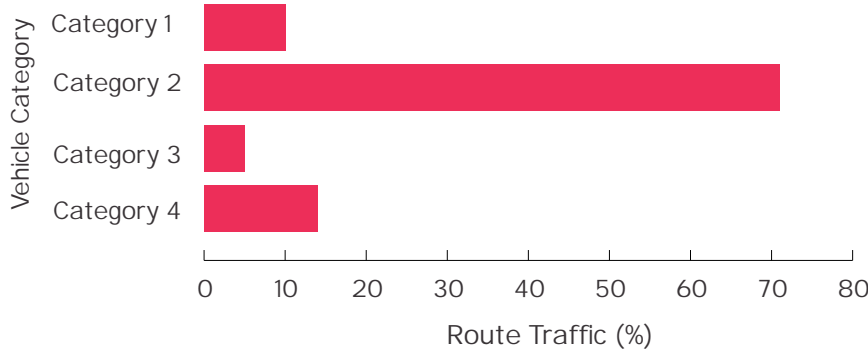


Figure 29: Route Traffic by Vehicle Category.  
Source: Federal Ministry of Works

Table 14 shows the average of traffic for the routes surveyed. The statistics takes account of both the left-hand-side and right-hand-side of the roads. Daytime count was done for 7 days while night time was for 3 days.

It was observed that trucks and heavy equipment vehicles ply more at night. From gathered statistics, almost 70% of the traffic at Route 1 was car passengers. A toll gate and operations will generate substantial revenue as shown in traffic count.

The traffic count data (table 15) shows revenue to be generated with current traffic flow on each of the Route 1 to Route 5 as described. As shown, none of the tolls is likely to generate less than 1 million naira in a day, while some of the routes can generate as high as NGN 6 million to NGN 7 million in a day. Even if there are provisions of alternative routes, approximately 80% of commuters will prefer to go along good roads and significant revenue will still be generated.



Table 14: Average Traffic Count by Routes.  
Source: Federal Ministry of Works, Abuja.

DAYTIME COUNT				NIGHTTIME COUNT		
	Right Hand Side	Left Hand Side	Total 2 - Way 7 Day Count	Right Hand Side	Left Hand Side	Total 2 - Way 3 Day Count
Route 1	5,943	6,289	85,624			
Route 2	4,639	4,644	64,981	1,375	1,336	8,133
Route 3	2,650	2,552	36,414	550	564	3,342
Route 4	11,307	13,302	172,263	1,781	1,754	10,605
Route 5	13,261	15,747	203,056			

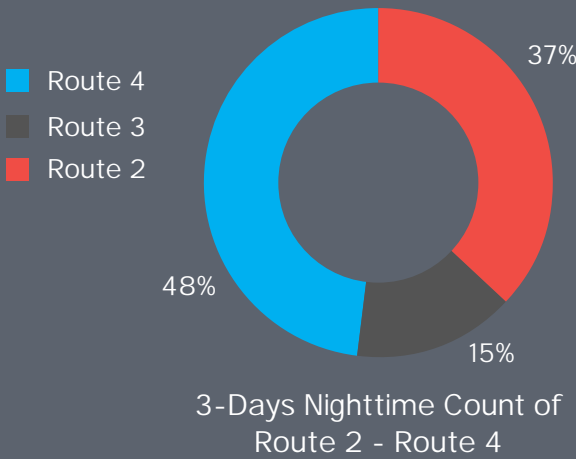
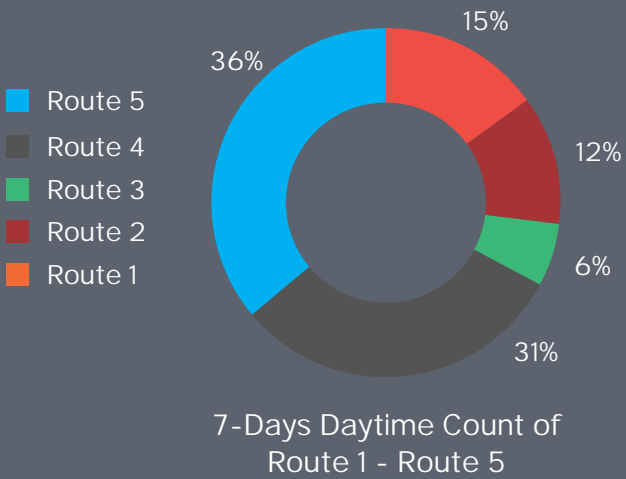


Figure 30: Route Day & Night Time Count.  
Source: Federal Ministry of Works

Location	Vehicle Type	Day Time (Average)	Night Time (Average)	Amount per Vehicle (NGN)	Total Vehicles	Daily Total Amount (NGN)	Remark
Route 1	Car	8,564		200	12,232	1,712,800	
	Heavy Vehicle	3,668		300		1,100,400	
						2,813,200	Only Daytime
Route 2	Car	6,034	1,084	200	11,994	1,423,600	
	Heavy Vehicle	3,249	1,627	300		1,462,800	
						2,886,400	
Route 3	Car	3,381	557	200	6,316	787,600	
	Heavy Vehicle	1,821	557	300		713,400	
						1,501,000	
Route 4	Car	19,687	2475	200	28,144	4,432,400	
	Heavy Vehicle	4,922	1060	300		1,794,600	
						6,227,000	
Route 5	Car	18,855		200	29,008	3,771,000	
	Heavy Vehicle	10,153		300		3,045,900	Only night time. Estimate 65:35 for vehicle type
						6,816,900	

Table 15: Traffic Count Generated Revenue  
Source: Federal Ministry of Works, Abuja.



## Lafenwa Bridge, Ogun State.



<sup>22</sup> [http://en.wikipedia.org/wiki/Katsina\\_Ala\\_River](http://en.wikipedia.org/wiki/Katsina_Ala_River)

<sup>23</sup> <http://blueprintng.com/2012/03/buruku-river-where-boats-ferry-loaded-lorries/>

<sup>24</sup> Ibid

<sup>25</sup> [http://www.leadership.ng/nga/articles/28601/2012/07/01/benue\\_riverine\\_community\\_seeks\\_bridge\\_over\\_river\\_buruku.html](http://www.leadership.ng/nga/articles/28601/2012/07/01/benue_riverine_community_seeks_bridge_over_river_buruku.html)

<sup>26</sup> <http://blueprintng.com/2012/03/buruku-river-where-boats-ferry-loaded-lorries/>

## Katsina – Ala River Bridge

### Overview and Background

Unlike the name may indicate, the Katsina-Ala river is not located in Katsina state but in Buruku in Benue State, Nigeria. The river serves as a major arm of the River Benue; the source is found in northwestern Cameroon, on the Bamenda highlands<sup>22</sup>. It is also known as River Buruku. The river separates Buruku local government from Logo and Katsina-Ala Benue State. The area is known for production of large quantities of yam. Another local government that shares a boundary with Katsina-Ala and Logo is Ukum, which also produces yams in large quantity. Ugbah is the headquarters of Logo local government<sup>23</sup>.

By road, it will take less than 20-minutes drive to get to Ugbah, and about 30 minutes to get to Ukum and Katsina-Ala respectively, starting from Buruku<sup>24</sup>.

There is however a challenge as there is no bridge at the river. Even some parts of the major villages of Buruku local government are across the other side of the river<sup>25</sup>. Therefore vehicles carrying yams and other goods travel far, often over approximately 150km, from Anyiin, Ugba, Ukum (Zaki-Biam) through Katsina-Ala and to Gboko local government. They then decide on proceeding to the southern or northern parts of the country<sup>26</sup>.

In an effort to devise means of easing their challenges, the Buruku locals use canoes to ferry humans and vehicles across the river. This is however very risky as the tools for the transportation are not appropriate heavy

equipment or sophisticated. They go across some distance, Gboko, Ugbema, Katsina-Ala before accessing Zaki-Biam, Ugba or Anyiin and the paddlers have admitted it is risky to ferry vehicles across. Commuters still take the risk though as they have little or no option. Buruku River crossing is regarded as the fastest way to Anyiin, Gbanyam village and Ugba town, the headquarters of Logo<sup>27</sup>.

Currently, not less than 200 vehicles are ferried across the river at the crossing point on a daily basis. The risk is higher during the rainy season as averagely about 3 to 4 cars get submerged in the process. Even prominent statesmen have lost their vehicles in this feat<sup>28</sup>.

It was approved recently that the engineering designs for the Buruku Bridge be done, the House of Representatives asked the Federal Ministry of Works to use the engineering designs for the construction of the bridge<sup>29</sup>.

The bridge would link points between Benue state and Taraba state, passing through Makurdi and Katsina-Ala in Benue to Wukari in Taraba. This will significantly reduce travel time for those who try to maneuver through possible routes, and travel risk for both water and road travelers. Return on investment will be through tolls. There is a bridge further to the project point, towards the borders of Cameroon.

### Traffic Analysis

Benue state was approximately 5 million in population in 2009 and has an annual growth rate of 2.8%<sup>30</sup>. The traffic on the routes that traverse through the water circuits and available roads can be estimated at 800

<sup>27</sup> [http://www.leadership.ng/nga/articles/28601/2012/07/01/benue\\_riverine\\_community\\_seeks\\_bridge\\_over\\_river\\_buruku.html](http://www.leadership.ng/nga/articles/28601/2012/07/01/benue_riverine_community_seeks_bridge_over_river_buruku.html)

<sup>28</sup> <http://blueprintng.com/2012/03/buruku-river-where-boats-ferry-loaded-lorries/>

<sup>29</sup> Ibid

<sup>30</sup> <http://www.benuestate.gov.ng/index.php/aboutus>



vehicles daily as surveyed.

A toll introduced will attract higher flow of traffic. Toll fees of N300 will be adapted and with annual growth of traffic, revenue from fees will significantly increase on an annual basis.

Analysis of the traffic to determine possible origin and final destination of vehicles was done. The bridge is very strategic with traffic from areas including Onitsha and Kano. Some models of the traffic routes involve interstate traffic or travel within the state and nearby surroundings.

Buruku Bridge as a cost-effective tool for commuters

Analyzing the status of the bridge as a cost effective tool took into account the current means of transport in terms of both time and money.

Ferries that transport both passengers and vehicles are one of the means of transport for commuters who wish to go across. Those who do not go through the ferry, either by choice or due to the size of their vehicles, take an alternative route to the nearest bridge route. The bridge will thus cater for these sets of people. The bridge will save on the following:

- a. Cost of ferries for transporting passengers across the river
- b. Cost of ferries for transporting vehicles across the river
- c. Time taken to maneuver through the alternative route to get across the river. This route takes more time than going directly across.
- d. Value of time for the passengers that use the ferries.

Cost of ferry use per annum in USD

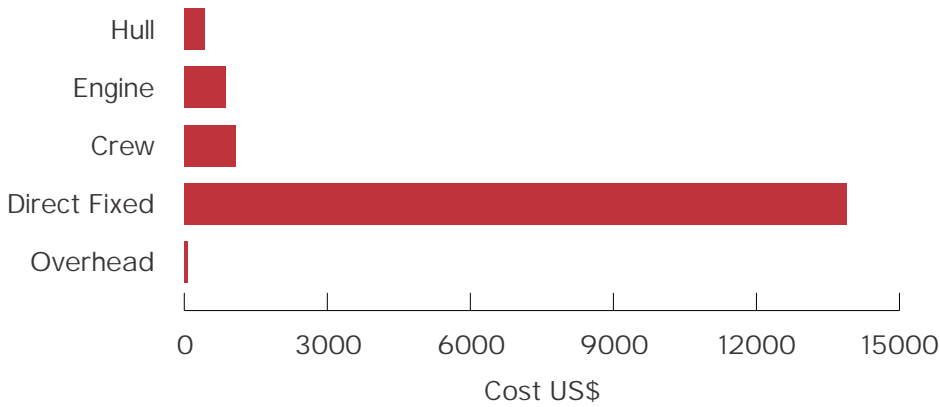


Figure 31: Cost of Ferry Use Per Annum.  
Source: Federal Ministry of Works

The total monetary value of acquiring and operating a small ferry for a year is about USD 38,940 divided into various costs as shown in chart above (figure 31). Average time spent on crossing a vehicle is approximately 48 minutes.

The construction of the bridge will save time for both passenger and vehicle crossing. It also presents a safer route of travel; most commuters now carry on as there is little or no option. It is assumed that if the origin and destination of the current crossings is within Yende and Zaki Biam respectively, then a travel distance of approximately 40km will be saved.

Third Mainland - CMS Link Bridge

“ In furtherance of the transformation agenda in the road sector and in its urgent bid to meet the yearnings of the public, the Federal Ministry of Works has also embraced some institutional reforms which will pave way for private sector financing of road infrastructure in Nigeria. ”



## 9.2 Future Key Pipeline Road Infrastructure Project also available for investments

In line with the transformational agenda of the present administration, the Federal Ministry of Works, through its BOLD approach, has embarked on development of a critical road infrastructure project described as green-field projects. The green-field project is being developed as a pragmatic approach towards tackling the burgeoning infrastructure deficit within the road sector.

Furthermore, the private sector will be solely responsible for driving the green-field project while the primary role of government will focus on its statutory responsibilities such as to create the enabling climate, provide the Right of Way (ROW) and offer guarantees in form of Viability Gap Funding (VGF) as the case maybe.

In view of this, the green-field project has been identified to comprise mainly of two primary alignments as below;

- i. The Golden Triangle Super-Highway
- ii. The 2nd Lagos Outer Ring Road
- i. Golden Triangle Super-Highway

The Golden Triangle Super-Highway was adapted from India's blueprint of the golden quadrilateral. The golden quadrilateral provides connection between four major metros of India with a total length of approximately 6,000km.

In Nigeria, the golden triangle of approximately 5,000 km provides

connection between key hubs of commercial activities across the country namely;

- (i) Lagos – Port Harcourt segment – approx. 560km,
- (ii) Port Harcourt – Kano segment – approx. 800km, and
- (iii) Lagos – Kano segment – approx. 870km.

The key features of the Golden Triangle Super-Highway are as follows:

- 4 to 6 lanes entirely new super-highway
- Within 1 hour of 30 cities and state capitals
- Crosses or within reach of 20 states of the Federation
- It will ensure the provision of world leading services on public highway facilities as well as attract Real Estate development along the ROW
- Private sector financed and tolled
- Engine for economic growth
- Economic Spine/Corridor
- Support existing key economic hubs
- New economies will be created along the corridor (e.g. tourism in the coastal alignment)
- Large scale employment generation, as the project will create over three (3) million jobs.
- Decongests our National road network due to expected large increase in vehicle ownership
- Provides revenue to Government
- Off Balance sheet of the Federal Government where VGF is not required
- Enhances inter-modal connectivity
- Enhances network connection to Ports
- Promotes private sector development.

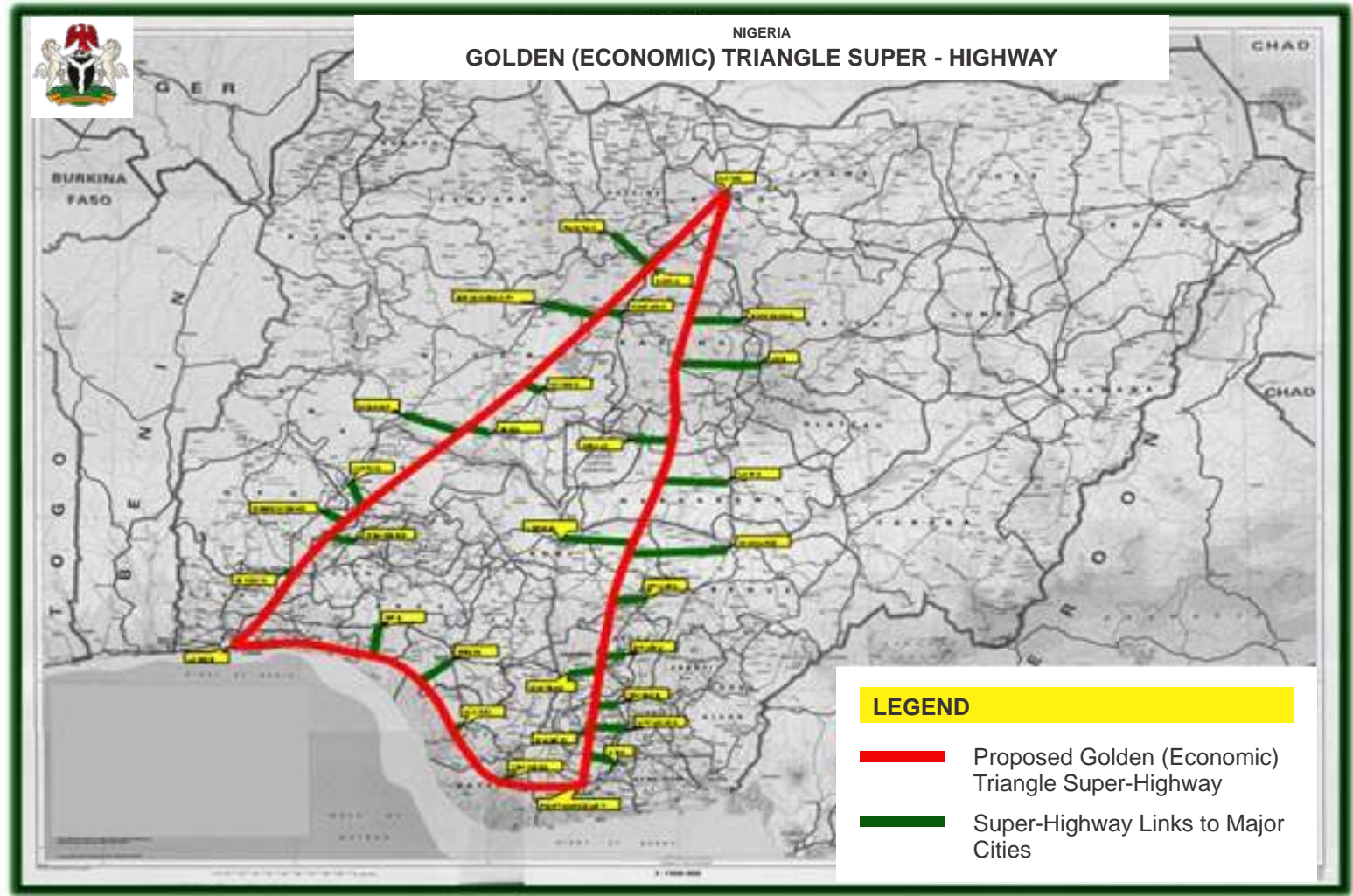


Figure 32: Golden (Economic) Triangle Super Highway.  
Source: Federal Ministry of Works



The project is estimated to cost the sum of NGN 960 billion and detailed identification of the route is on-going.

#### 2nd Lagos Outer Ring Road

The 2nd Lagos Outer Ring Road is being developed with the aim of decongesting heavy traffic volume currently experienced within the Lagos metropolitan area. For instance, the heavy duty trailers and tankers from the ports and Apapa petroleum depots will utilize this alternative route thereby decongesting traffic along the Apapa – Oshodi highway. Under the proposed transaction arrangement, the road project is planned to be implemented in collaboration with the governments of Lagos and Ogun state. The design of the alignment has been completed and Outline Business Cases available at the PPP office of the Federal Ministry of Works. The road project with a total length of approximately 99km is comprised of two phases

Phase 1:  
Tin Can Island – Igando – Lagos/Otta road Interchange – Lagos/Ibadan expressway (74km);

Phase 2:  
Lekki – Ikorodu – Ijebu Ode on Shagamu/Benin expressway (25km).

Other proposed PPP highway projects available for Investors;



Project Title	ILORIN-JEBBA-MOKWA-KADUNA ROAD
Length (KM)	458
Terrain	The road traverses a rolling terrain. The terrain is predominantly sloppy on short grades with noticeable undulations. Deposits of coarse sand are noticed at the valleys resulting from the short grades.
Design Specifications	Carriageway width - 7.3m wide, 2.75 surface dressed shoulders on either side; Laterite fill: 200mm laterite sub-base, 200mm crushed stone base, 60mm asphalt binder course with bitumen content of 4.5-6%, 40mm wearing course with bitumen content of 5.5-6.5%.
Project Description	<ul style="list-style-type: none"><li>▪ Ilorin-Kaduna Road is a section of the arterial North-South Route A1/A125 and forms part of the Trans-Saharan Africa route,</li><li>▪ The Trans-Saharan Highway links Lagos, the commercial nerve center of Nigeria to Niger Republic and Algiers in Algeria.</li><li>▪ There are about 35 bridges along the road alignment with several culverts and other hydraulic structures.</li><li>▪ The section of the road under consideration is 458km long and lies between Longitude 07° 30'E &amp; 04° 30'E and Latitude 10° 30'N &amp; 08° 30'N.</li></ul>
Estimated Annual Daily Traffic in 2012	6,855
Estimated Project Cost (NGN ' Billion)	221.2
Concession Period (years)	25



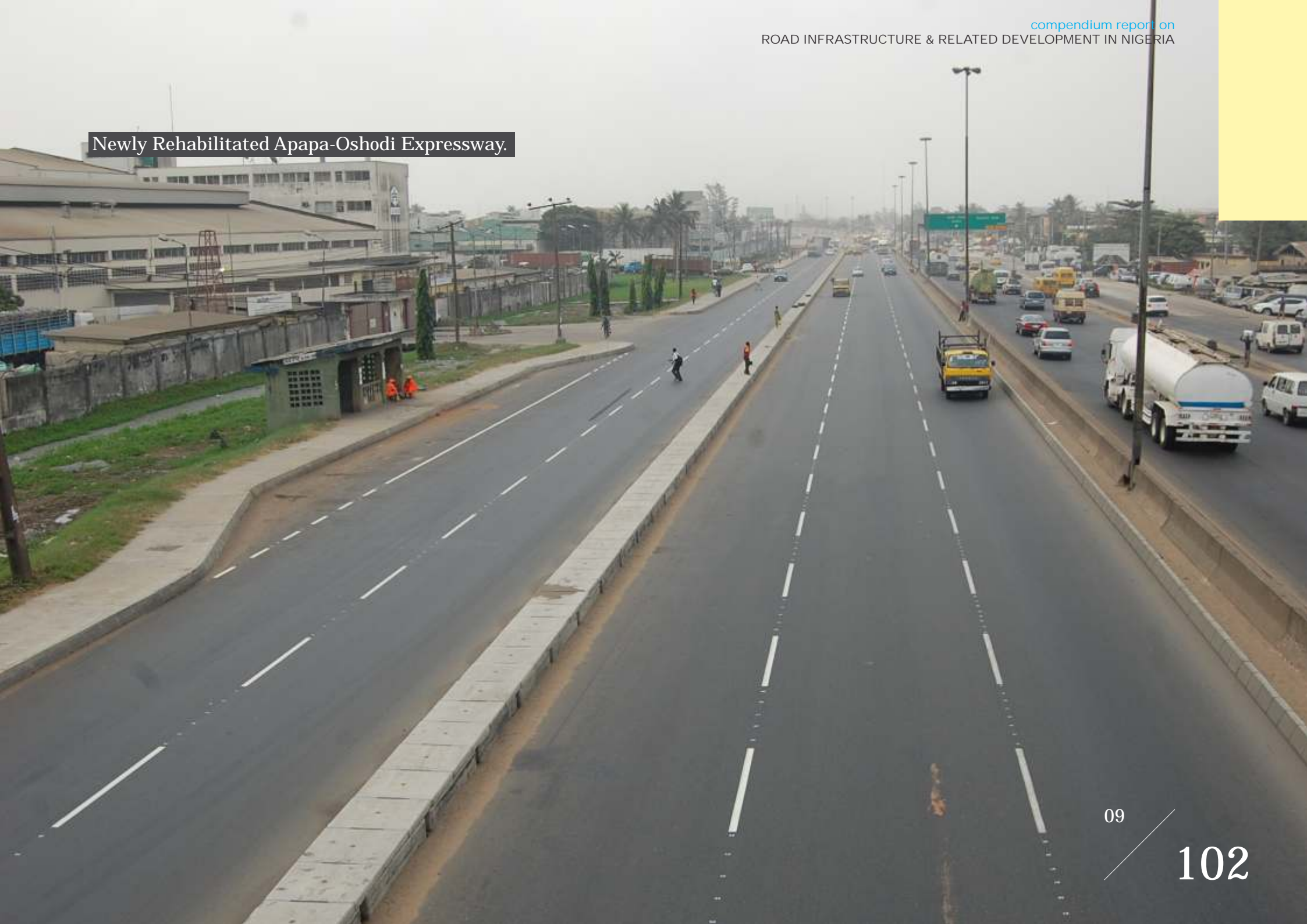


Marina Bridge, Lagos.

Project Title	ENUGU - 9TH MILE - MAKURDI ROAD
Length (KM)	251
Terrain	Rolling with gentle slopes
Design Specifications	Existing Carriageway width - 7.3m wide , 2.75 surface dressed shoulders on either side; Laterite fill: 200mm laterite sub-base, 200mm crushed stone base, 60mm asphalt binder course with bitumen content of 4.5-6%, 40mm wearing course with bitumen content of 5.5-6.5%.
Project Description	<ul style="list-style-type: none"><li>▪ Ilorin-Kaduna Road is a section of the arterial North-South Route A1/A125 and forms part of the Trans-Saharan Africa route,</li><li>▪ The Trans-Saharan Highway links Lagos, the commercial nerve center of Nigeria to Niger Republic and Algiers in Algeria.</li><li>▪ There are about 35 bridges along the road alignment with several culverts and other hydraulic structures.</li><li>▪ The section of the road under consideration is 458km long and lies between Longitude 07° 30'E &amp; 04° 30'E and Latitude 10° 30'N &amp; 08° 30'N.</li></ul>
Estimated Annual Daily Traffic in 2012	7,723
Estimated Project Cost (NGN ' Billion)	110
Concession Period (years)	25



Project Title	JOS-AKWANGA-MAKURDI ROAD WITH LINK TO KEFFI FROM AKWANGA
Length (KM)	251
Terrain	Rolling to hilly, with occasional flat stretches
Design Specifications	Existing Carriageway width - 7.3m wide , 2.75 surface dressed shoulders on either side; Laterite fill: 200mm laterite sub-base, 200mm crushed stone base, 60mm asphalt binder course with bitumen content of 4.5-6%, 40mm wearing course with bitumen content of 5.5-6.5%.
Project Description	<div><ul style="list-style-type: none"><li>▪ Jos – Akwanga - Makurdi Road is located in North Central Zone of Nigeria</li><li>▪ The road lies between longitude 08° 30'E and 09° 00'E and latitude 08° 30'N and 10° 00'N</li><li>▪ The Road alignment is part of Route A3 which is one of the major North-South Highways in Nigeria.</li><li>▪ The Northern part of the route extends up to N'Djamena in Chad Republic through Borno State in Nigeria while the Southern part terminates at Port Harcourt in Rivers State one of the economic nerve centers of Nigeria with crude oil facilities and Sea Ports.</li><li>▪ The road is 395km long and links four (4) States of Nassarawa, Kaduna, Plateau and Benue.</li><li>▪ There are 19 bridges along the road alignment with several culverts and other hydraulic structures.</li><li>▪ The road also links Keffi (Route A234) from Akwanga and connects the Nigeria capital Abuja.</li></ul></div>
Estimated Annual Daily Traffic in 2012	6,547
Estimated Project Cost (NGN ' Billion)	181.13
Concession Period (years)	25



Newly Rehabilitated Apapa-Oshodi Expressway.



Project Title	BODO-BONNY ROAD
Length (KM)	39
Terrain	Rolling with gentle slopes
Design Specifications	<ul style="list-style-type: none"><li>▪ The route traverses through thick forests, swamps and creeks.</li><li>▪ It is a virgin route with no history of any development.</li><li>▪ The Project area is criss-crossed by numerous creeks and rivers, which empty into the Atlantic Ocean.</li><li>▪ The roadway from km6+400-km30+700 traverse swampy terrain which is inundated by the daily tidal flow around the area.</li></ul>
Project Description	<ul style="list-style-type: none"><li>▪ The road lies between longitude 07° 30'E and 07° 00'E and latitude 05° 00'N and 04° 30'N</li><li>▪ The road links Bodo on the mainland to the industrial Island of Bonny that houses the Liquefied Natural Gas (LNG) factory in Rivers State.</li><li>▪ There are three bridges to be constructed across creeks and rivers along this route: Afa creek (507m); Opobo creek (1000m); Nanabie creek (507m)</li></ul>
Estimated Annual Daily Traffic in 2012	---
Estimated Project Cost (NGN ' Billion)	24 (Initial Contract Sum)
Concession Period (years)	25

Federal Road Safety Corps patrol van funded by the  
Federal Ministry of Works, Abuja





Project Title	NUPEKO BRIDGE
Length (KM)	286
Project Description	<ul style="list-style-type: none"><li>Construction of a new bridge at Nupeko, located halfway between Koton Karifi Bridge and Jebba Bridge, across river Niger. The proposed bridge will provide continuity of the Bida-Nupeko- Pategi road connecting State/Primary Roads.</li><li>Nupeko is located in food producing area of Niger State of Nigeria producing rice and other cereals, and fish. The proposed Nupeko Bridge will link the food producing areas to larger markets in urban areas. The bridge will be the main link to the South of the River Niger. The project bridge will therefore be a major link to South of River Niger, and it is expected to boost economic activities in the area.</li><li>The proposed bridge is on the Federal road from Bida in Niger state through Nupeko to Patigi in Kwara state. Therefore, Kwara and Niger States can be considered as the project influence areas. Bida is located on Latitude 9 05'5N and longitude 06 00'E, while Patiki is located on Latitude 9 00'N and Longitude 7 34'E.</li></ul>
Estimated Average Daily Traffic	2989
Average Crossing Time (Hours)	4
Total Capital Investment Cost (US' Millions)	20.2
Economic Internal Rate of Return (%)	33.0
Net Present Value @ 12% discount rate (US' Million)	8.18
Concession Period (years)	20

River Niger Bridge.





Project Title	IBI BIRDGE
Project Description	<ul style="list-style-type: none"><li>▪ The proposed Ibi bridge located in Taraba state is a critically important commercial link for the north and south of river benue and enhance the movement of people, agricultural produce and services.</li><li>▪ Ibi is an administrative town located approximately 154Km North-East (Upstream) from Markurdi where the nearest road crossing exists, the next upstream bridge across the benue river is at Numan in Adamawa State.</li></ul>
Traffic generated per day @ 4%, 6% & 8% for 2015	1000/1000/1100 respectively
Crossings/year	225,901
Total Cost of Construction (NGN' Million)	34.9
Total Project Cost (NGN ' Million)	5405.4
Government Grant NGN million	270.3
Economic Internal Rate of Return (%)	37.5
Net Present Value @ 12% discounted rate (US ' Million)	95.74
Concession Period (years)	25

Zaria - Kano Road  
Before the Intervention of FMW



After





Project Title	LAGOS-ISEYIN-KISHI-KAIAMA ROAD
Length (KM)	414.4
Terrain	The terrain varies from moderately plain to highly rolling. The project alignment has steep gradients at some places.
Design Specifications	<ul style="list-style-type: none"><li>▪ The Thickness of the Wearing Course: 40mm</li><li>▪ The Thickness of the Binder Course: 60mm</li><li>▪ The Thickness of the Base Course: 250mm</li><li>▪ The Thickness of the Sub Base Course:230mm</li></ul>
Project Description	<ul style="list-style-type: none"><li>▪ The project road is an alignment which comprises of existing 2-lane alignments starts from Km 33.000 of Badagry-Lagos expressway and ends at a roundabout at Kaiama town. The road traverses through Lagos, Ogun, Oyo and Kwara states.</li><li>▪ There are 20 major junctions in the influence area/ rural areas of the project road</li><li>▪ There are 12 existing bridges along the project road section. Their total length measured is 465 m.</li><li>▪ There are 93 culverts in the project road section, of which 85% are in good condition but require an extension.</li></ul>
Average Daily Traffic Volume	35,406
Cost of Civil Works (NGN' millions) @ 5% VAT	112,303.84
Total Cost of the Project (NGN Million)	156,095.89
Concession Period (years)	22





Project Title	ONITSHA - ENUGU ROAD
Length (Km)	108.6
Design Specification	<ul style="list-style-type: none"><li>▪ 200mm aggregate subbase hardcore</li><li>▪ 250mm aggregate base course (Crushed Stone)</li><li>▪ 225mm aggregate road base (filter stone)</li><li>▪ 60mm binder course</li><li>▪ 40mm wearing course</li></ul>
Project Description	<ul style="list-style-type: none"><li>▪ The project road is a critically important commercial link between Onitsha, the largest market in West Africa and Enugu.</li><li>▪ The project road is one of the main links between the east and west of the country.</li><li>▪ The project road remains the dominant means to facilitate collection and distribution of products from the popular market and nearby farmlands to other parts of the country along this alignment.</li></ul>
Average Daily Traffic	65,388
Total Cost of the Project (US ' Million)	334
Economic Internal Rate of Return (%)	36.8
Net Present Value @ 12% discounted rate (US ' Million)	639.18
Concession Period (years)	25

Onitsha Head Bridge - Upper Iweka  
Before the Intervention of FMW



After





### 9.3 Case Studies of Successful Projects/Program Funded by Alternative Sources

Based on empirical evidence, it has been established that funding road infrastructure through the annual budgetary allocation has proven to be unsustainable. Moreso, the economic implication of the absence and/or decay of existing road infrastructure has also been highlighted into perspective. Consequently, the Federal government of Nigeria has embarked on securing alternative mechanism of financing road infrastructure development other than the usual meager annual budgetary allocation.

With this innovative approach, the present administration through the Federal Ministry of Works have recorded tremendous success in tackling the enormous challenges facing delivery of enhanced quality and capacity road network of highway network in Nigeria.

In view of this, there have been a considerable number of road infrastructure projects/program funded by alternative means that have recorded a remarkably high success rate. The following are only a few of these projects/programs identified to fall under this category;

#### Federal Road Sector Development Program (FRDP)

The FRDP is a first phase of the implementation process of the Road Sector Development Management Program (RSDMP). Moreso, the FRDP is one of the biggest road infrastructure development projects in Nigeria. In fact, once completed, it will represent one of the most visible symbols of

modern development across the country. FRDP is an enormous challenge, as such the Federal Government of Nigeria has entrusted the execution of this project to the Road Sector Development Team (RSDT). As discussed previously, RSDT is a self-accounting, performance-based semi-independent unit within the institutional framework of the Federal Ministry of Works.

Furthermore, the mandate of the RSDT is to initially manage the implementation of RSDMP on behalf of the Federal Ministry of works over a 10-year period with the assistance of funds available from multi-lateral agencies. The funding includes USD330million credit from the International Development Association - IDA (i.e. World Bank - WB), and a USD162 million loan from the African Development Bank (AfDB) etc.

The following highlights the “before and after” scenarios of construction works on some of these selected road projects.

#### WORLD BANK PROJECTS

##### SECTION OF RUMUKRUSHI-CHOKOCHO ROAD IN RIVERS STATE

Before



After





SECTION OF JEBBA-LAFIAJI ROAD IN NIGER STATE

Before



After



SECTION OF ENUGU-ABAKALIKI ROAD IN NIGER STATE

Enugu-Abakaliki Road awarded in December 2011 and flagged-off in February 2012. Contract Sum of US\$57.8million

Grading of Shoulder



Scarification of Shoulder





AFDB PROJECTS

SECTION OF ABAKALIKI-MBOK (OGOJA JUNCTION) ROAD

Abakaliki - Ogoja Junction awarded in November 2009 and completed in June 2012 (AfDB funded). Contract Sum of approximately US\$68.3million. Moreso, Ogoja Junction-Ikom Road also awarded in December 2011 and flagged-off in February 2012. Contract Sum of US\$39.8million

Before



After



IKOM – MFUM ROAD AS AT COMPLETION IN JUNE 2012

Ikom - Mfum, awarded in November 2009 and completed in July 2011 (AfDB funded). Both contracts are with combined contract sum of approximately US\$18.6m.

Before



After



These two road projects funded by Africa Development Bank have been earmarked under the emerging concept of Output-based Performance Rate Contract (OPRC). The OPRC initiative is described as a step towards sustainability of road infrastructure projects embarked upon by Government and multilateral agencies. The initiative is employed in developed countries as standard industry best practice for the award of international contract.

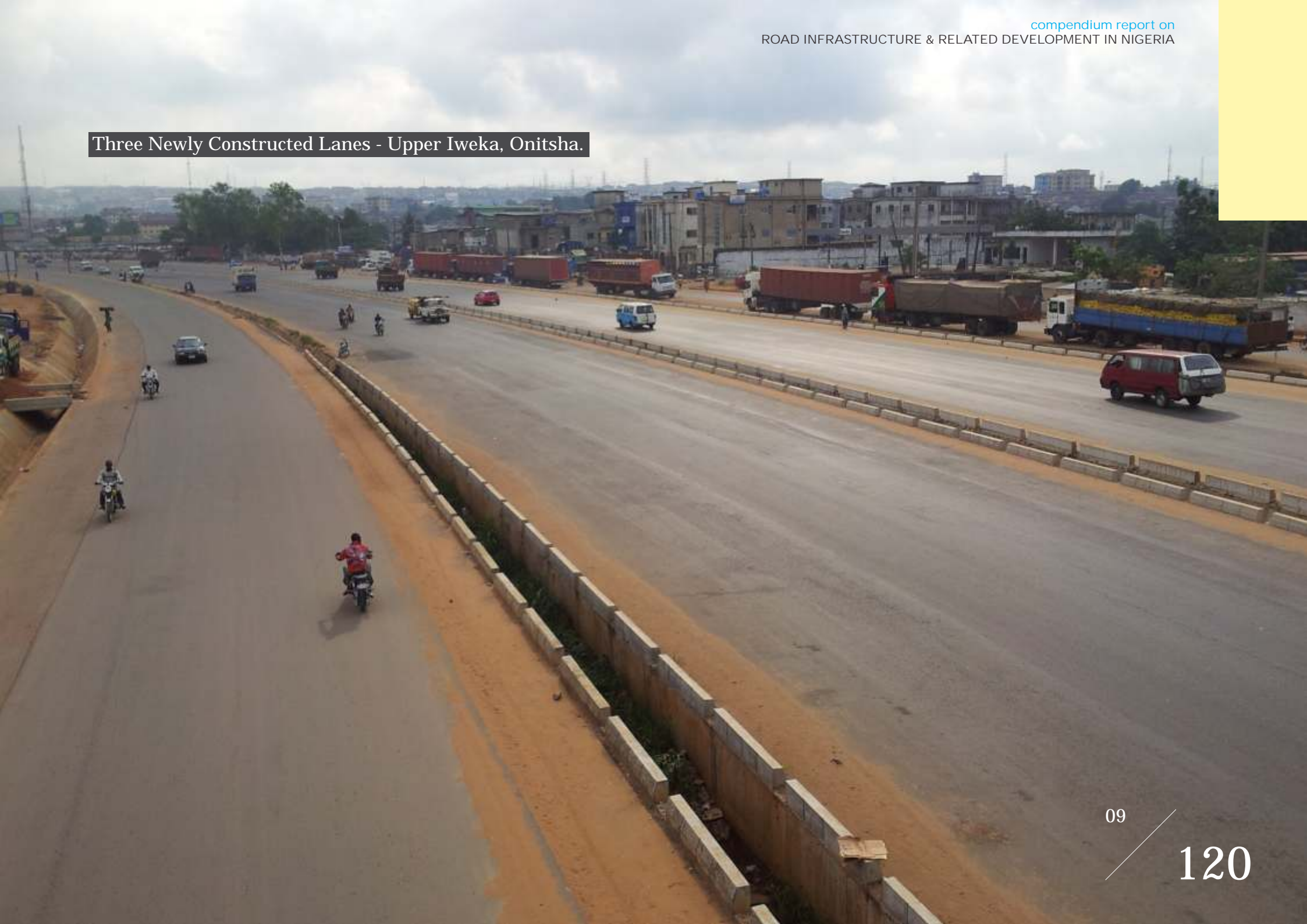
The Federal Ministry of Works (FMW) represented by Road Sector

Development Team (RSDT) embarked on invitation of sealed bids from eligible bidders for the Output and performance-Based Road Contract (OPRC) for the above alignments.

The OPRC road maintenance services shall comprise but not limited to the following services: Maintenance of pavement structure; maintenance of road shoulders; maintenance of roadside areas (removing obstructions and vegetation control; maintenance of bridges, culverts and drains; maintenance of traffic signs, guardrails, etc.

“ These two road projects funded by Africa Development Bank have been earmarked under the emerging concept of Output-based Performance Rate Contract (OPRC). The OPRC initiative is described as a step towards sustainability of road infrastructure projects embarked upon by Government and multilateral agencies. The initiative is employed in developed countries as standard industry best practice for the award of international contract. ”

Three Newly Constructed Lanes - Upper Iweka, Onitsha.





## 10. Conclusion

The Federal Government of Nigeria has identified private sector participation in the development of the road sector as a sustainable approach towards tackling the road infrastructure deficit in the country. Furthermore, the government of Nigeria through the Federal Ministry of Works has taken bold initiatives in this direction by developing Outline Business Cases through notable transaction advisory services for viable and bankable major highways in the nation to attract private sector and foreign investments into the sector.

Following an expanding population, increased economic activities and the pressing need to connect, there has been a massive road infrastructure deficit hampering progress and failure to support thereby stunting growth and development in many areas. For instance, citing the real estate sector, one of the critical factors that determine the value of any real estate property is the amenities available in proximity. One of such amenities is provision of road infrastructure. Typically, access roads that provide access to communities and businesses for smart growth will increase property values while roads that serve as barriers, or redirect traffic away from particular areas, will cause a decline in property values.

This report provides an overview of the road sector in Nigeria and also identified selected road infrastructure projects through a review of outline business cases (OBC) developed by the public-private partnership of the Federal Ministry of Works. The information contained in this report have highlighted the basic

indicators of viable and bankable road infrastructure projects in the road sector namely Capital costs, traffic volume, user fees and concessionary period for each of the selected projects in details.

However, in-depth details confirming the revenue streams, allocation of risks, net present value analysis (NPV), and sufficient scale for absorbing transaction costs as well as high transaction success rate are available in the Outline Business Cases that have been developed for each of the alignment. Moreso, the irresistible offer in terms of information that has been provided by this report will secure the interest of most financiers approached for funding. In addition, the other parts of the report have also identified key future pipeline road projects like the Super Golden Triangle and Lagos Outer Ring Roads for private sector participation.

To achieve scale and a friendly business environment, the government of Nigeria has put in place adequate mechanisms to ensure a favourable climate for businesses to thrive.

Finally, we welcome all prospective investors who are interested in building not just road infrastructure but economic corridors within the largest African nation in the world.

Ikoyi - Dolphin - Marina - Sangross Interchange





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