INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN 2278 – 0211 (Online)

Attaining a Higher National Growth Trajectory Via Sustainable Civil Infrastructure: Case Nigeria

Olatunji Ariyomo
COREN Regd., MNSE, MIET, National Development Initiative (NDi)
18 Impact, Upper Allen, S3 7AY, Sheffield, UK
Oyedokun A. Abiodun
SURCON Regd., MNIS, Department of Surveying and Geoinformatics
PMB 5351, Federal Polytechnic Ado-Ekiti, Nigeria

Abstract:
This two part paper examines the symbiotic link between public infrastructure and growth and advances a view in favour of a systemic infrastructure development model for Nigeria based upon the latent potential of the nation's infrastructure as a critical success factor in attaining a higher socio economic growth trajectory for the country. Using examples of certain development role models, It argues in favour of a staged development plan starting with the current v2020 – with infrastructure development having primacy - that will see government playing a central role in its first trimester witnessing a heavy investment of the proceeds of the nation's natural advantage (crude revenue) in her infrastructure growth and allowing the private sector to gradually take over and build upon this in subsequent plans.
The second part of the paper will examine the cost of infrastructure shortages and mismanagement upon the nation's real sector and identifies corruption as a major issue militating against the development of the required national infrastructure quota. The paper directly recommends a model that will reduce the influence of corruption and politicisation on the nation's contract procedures.

Keywords: *Sustainable civil infrastructure, development, economic growth, Nigeria, system driven growth, GIS*

1. Introduction

From a global perspective, physical and social developments are increasingly being driven by a nexus that connects institutions, infrastructure, and economic growth. This premise suggests that a nation will be poor and incapable of meeting her needs if she fails to operate a national policy designed to promote her infrastructure's sustainable growth by striking the right cord in the institution, infrastructure and economic growth tripod.

There appears a general consensus that infrastructure has a positive impact on economic growth and to alleviate the constraints to growth and poverty reduction, some scholars have advocated for a massive increase in public investment in infrastructure premising this upon the position that "infrastructure services have a strong growth-promoting effect through their impact on production costs, the productivity of private inputs, and the rate of return on capital—particularly when, to begin with, stocks of infrastructure assets are relatively low" (Agénor, 2010). Other works have however indicated strongly that infrastructure's impact goes beyond the aforesaid to include indirect consequences that however have appreciable effect on growth such as through nonlinear effects and impacts of infrastructure upon people's health and wellbeing.

This paper reviews scholarly works on the infrastructure-growth nexus globally, identifies inefficient infrastructure management and corruption as a major negative factor against infrastructure growth and apply the established arguments in relation to the Nigeria case to develop a system driven model to protect the nation's contracting procedure from exposure to abuse. The paper canvasses a **system driven** institutionalized approach to promoting efficient development of infrastructure and a system driven strategy for the sustenance of public infrastructure and the escape of corruption-induced pitfalls on the path of infrastructural development. It itemizes the constrains confronting Nigeria in this regards and attempts to proffer solutions to these constraints using examples from specific development role models with some having historical growth trajectory similar to that of Nigeria.

Referencing specific examples of development role models, the paper argues that poor nations are characterised by systems that depend on people while rich nations are characterised by systems that people depend upon. The aggregate systemic shift by any underdeveloped nation will determine the direction of movement - upward or downward pattern - of her economy.

Dwelling partly upon these views and prior works and findings by others, this paper presents a theory of development based on public infrastructure as the main trigger of growth in Nigeria and argues strongly in favour of a government led 'birthing' of public infrastructure - during the first trimester ahead of 2020 - and the conversion of such leapfrog gains in public infrastructure into national assets via an array of investor friendly but fair trade policies and legal frameworks that will ultimately promote the natural emergence of a private sector led infrastructural investment that is competitively, equitably and fairly regulated.

The paper canvasses for the introduction of a regime of breadcrumbs of regulations in public infrastructure contracts and management that will: utilize a model of transparency not currently in use; enable contract procedure and management to be governed by regulations that whittle down the influence of politics (politicians – corruption, nepotism, favouritism etc) and bureaucracy (civil servants – corruption, nepotism, favouritism, mediocrity etc) , and; protect programme continuity in successive governments. The breadcrumbs of regulations will constantly leave direct trails which will tie each stage of public contracts to a common or central regulation and empower the public to legitimately flag issues and ask questions - and in extreme instances of potential failures - caused to be enforced 'public procurement sanctity and rights'; thereby promoting enhanced transparency and infrastructure deployment efficiency.

Infrastructure, economic growth and corruption – a review

2. Defining Infrastructure

Infrastructure means different things to different groups or people as it is "*both relational and ecological ... being the balance of action, tools, and the built environment, inseparable from them*" (Star, 1999).

Infrastructure refers to "the services and facilities necessary for an economy to function" (Sullivan & Sheffrin, 2003).

The World Bank considers infrastructure sectors to include "energy, information and communications; mining, transportation, urban development, and water supply and sanitation" (World Bank, 2001).

The American Heritage Dictionary of English Language (AHDEL) focuses its contemporary definition of infrastructure on the following:

- An underlying base or foundation especially for an organization or system.
- The basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, post offices, and prisons (AHDEL, 2010).

On July 15, 1996, President Bill Clinton's Executive Order 13010 defined infrastructure as "The framework of interdependent networks and systems comprising identifiable industries, institutions (including people and procedures), and distribution capabilities that provide a reliable flow of products and services essential to the defense and economic security of the **United States**, the smooth functioning of government at all levels, and society as a whole"(Moteff & Parfomak, October 1 2004). This definition was consistent with what could be described as a definition from a national security point of view even as Sec. 1016 (e) of the USA PATRIOT and Homeland Security Acts, in response to the September 11, 2001 terror attacks defined critical infrastructure as *systems and assets, whether physical or virtual*.

In its explanatory notes on usage, AHDEL explains that the term **"**has been used since 1927 [this is supported by Oxford English Dictionary (2010)] to refer collectively to the roads, bridges, rail lines, and similar public works that are required for an industrial economy, or a portion of it, to function" and that "perhaps because of the word's technical sound, people now use *infrastructure* to refer to any substructure or underlying system" including extended use to cover people e.g., "that terrorist organizations have an infrastructure of people sympathetic to their cause". AHDEL added that it's "Usage Panel finds this extended use referring to people to be problematic" (AHDEL, 2010).

The word has become so extensively applied (Prud'homme, 2005) with matching etymological changes in meaning that it sometimes becomes nebulous and debateable. Compare AHDEL (2010).

Prud'homme (2005) restricted the meaning of infrastructure to describe objects like the ones listed in AHDEL's definition which have in common all or most of the attributes in Table 1 which shows the relationship between infrastructure and the associated services. The attributes are that they:

- Are capital goods
- Are not consumed directly. Rather, in combination with labour, and possibly other inputs
- Provide services.

Service	Associated infrastructure
Transportation	Roads, bridges, tunnels, rail tracks, harbours, etc.
Water supply	Dams, reservoirs, pipes, treatment plants, etc.
Water disposal	Sewers, used water treatment plants, etc.
Irrigation	Dams, canals
Garbage disposal	Dumps, incinerators, compost units
District heating	Plant, network
Telecommunication	Telephone exchanges, telephone lines, etc.
Power	Power plants, transmission & distribution lines

Table 1: Infrastructure and Associated Services

He concluded that "what matters is the service, much more than the infrastructure used or needed to produce it. Policies should focus on the end, service provision, not on the means, infrastructure endowment. The confusion often made between the two reflects the fact that, in many cases, the role of the infrastructure is predominant in the production of the service, or, to put it otherwise, that these services are very capital intensive" (Prud'homme, 2005). This agrees with the emphasis at the conclusion of the equivalent definition provided by Oxford English Dictionary that infrastructure is the "basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise" (Oxford English Dictionary, 2010) and the proviso - "for an economy to function" added by Sullivan & Sheffrin (2003).
This definition by Prud'homme (2005) will suffice for the purpose of this paper which is principally "civil infrastructure" (see table 1 as itemized).

3. Infrastructure, Institutions and Economy

3.1. Institutions and Infrastructure
A working paper of the Centre for Development Studies (Centro Studi Luca D'Adliano), University of Milan, produced from a panel of 284,049 bilateral trade flows covering 1988 to 2002 explored the influence of infrastructure, institutional quality, colonial and geographic context, and trade preferences on the pattern of bilateral trade. Using selection-based gravity modelling of trade flows, the paper concluded that many African countries remain "consistent underperformers" largely due to weak or lack of qualitative institutional framework to support efficient infrastructural system. The "results support the notion that export performance, and the propensity to take part in the trading system at all, depends on institutional quality and access to well developed transport and communications infrastructure. Indeed, this dependence is far more important, empirically, than variations in tariffs in explaining sample variations in North-South trade. This implies that policy emphasis on developing country market access, instead of support for trade facilitation, may be misplaced (Francois & Manchin, January 2007).
Of particular interest are the following variables used in the above study:

- Government efficiency. This is the efficiency required in putting the infrastructure in place. This will include cost and best practice benchmarks as well as measuring the competence of the bureaucracy and the quality of public service delivery)
- Political stability – this measure the uncertainties with regard to changes in political leadership, violence and threats of violence and terrorism
- Regulatory quality (measuring the incidence of market-unfriendly policies)
- Rule of law (measuring the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence), and;
- Voice and Accountability (measuring political, civil and human rights).

3.2. How They Impact the Economy
Extensive research works have shown that there are empirical correlation in the institutions, infrastructure and economic growth tripod. Bruijne and Eeten (2007) found that "critical infrastructures constitute the backbone of the society by providing it with services that are essential for its functioning" (Bruijne & Eeten, 2007). This is correlated by Johansson and Hassel (2010) stating that infrastructure is not only critical for growth but a 'dislocation' of same will negatively impair growth. "Disruptions in infrastructural services may inflict large consequences to health, safety, security and the economy" (Johansson & Hassel, 2010).
A study by Esfahani *et al.* (2003) which actively employed an approach that specified the convergence rates and steady-state conditions of various national assets as functions of country characteristics and estimates them as such came to a similar conclusion that cross-country estimate of his model confirms that Gross Domestic Product (GDP) is substantially affected in the positive by the contribution of infrastructure and that this generally do exceed the cost of provision of those services and that "the steady-state elasticity of infrastructure with respect to total investment is greater than one, which means that the countries that manage to invest more do so particularly in infrastructure sectors"(Esfahani & Ramı´rez, 2003).

Agenor (2010) proposed in "A theory of infrastructure-led development" that long-run development based on public infrastructure is the engine of growth. The government, by investing in infrastructure, indirectly spends on health services, which in turn raise labour productivity and lower the rate of time preference. By this, infrastructure has a cumulative and nonlinear impact on both production and the public to the extent that the degree of efficiency of infrastructure is exponentially related to the stock of public capital provided there is adequate level of public investment efficiency (Please compare this with the variables used by Francois and Manchin, 2007). Thus all things being equal, increasing the share or expenditure on public infrastructure financed through a reduction of unproductive expenditure or foreign grants may "facilitate the shift from low growth equilibrium, characterized by low productivity and low savings, to a high growth steady state" (Agénor, 2010).

Calderon and Serven (2004) supported the position with an empirical evaluation of the impact of infrastructure development on economic growth and income distribution using a large panel data set from 1960 to 2000 and encompassing over 100 countries. They utilised estimated simple equations for GDP growth and conventional inequality measures, augmented to include, among the regressors, infrastructure quantity and quality indicators, in addition to standard controls. To account for the potential endogeneity of infrastructure (as well as that of other regressors), the authors use a variety of generalized-method-of-moments (GMM) estimators based on both internal and external instruments and report results using both disaggregated and synthetic measures of infrastructure quantity and quality.

3.2.1. Their Results Are:

- Growth is positively affected by the stock of infrastructure assets, and
- Income inequality declines with higher infrastructure quantity and quality.

These findings can be better appreciated when the infrastructure conditions of a state like the United Kingdom is situated in context against states like Nigeria.

According to Calderon and Serven, their "two results combined suggest that infrastructure development can be highly effective to combat poverty. Furthermore, illustrative simulations for Latin American countries suggest that these impacts are economically quite significant and highlight the growth acceleration and inequality reduction that would result from increased availability and quality of infrastructure" (Calderon & Servén, 2004).

Because of the exponential nature of the various factors that have linear and nonlinear impact on infrastructure, it has become expedient that its governance would not be by science, logic or common sense alone but also by the politics of infrastructure. We are therefore, although with different targets, interested, like Young and Keil (2010) in the "the politics that produced the (public) modern infrastructural ideal" (Young & Keil, 2010) for a place like Abuja while other parts of Nigeria including the Niger Delta region, ostensibly the goose laying the golden egg, continue to suffer serious infrastructure drought.

Even rich nations appreciate the critical importance of effective infrastructure governance and the need to close their infrastructure gap as the economy continues to grow. Infrastructure—whether in the form of roads, bridges, tunnels, passenger rail, pipelines or power lines—is critical to sustained economic growth and quality of life. "Our cities, our industries, our entrepreneurs and our wage owners can't prosper without the highways, bridges, tunnels, ports and airports which are the sinews of a well functioning economy. We can't prosper unless our public works infrastructures keep up with the need of a growing economy (Husock, 2008). This agrees with the import drawn from Aschauer (1989), the 'Aschauer hypothesis', that governments "can increase real output and productivity substantially by stepping up infrastructure investment" (Ford & Poret, 1991, p. 2).

3.3. Infrastructures As Assets

Infrastructures are assets (Moteff & Parfomak, October 1 2004). Hulten (1996) established the significance of effective infrastructure use stating that inefficient use of infrastructure results in growth penalty for low and middle income economies in the form of a reverse loss or smaller benefit accruals from infrastructure investments. "The magnitude of this penalty is apparent when the growth experience of Africa is compared with that of East Asia: over one-quarter of the differential growth rate between these two regions can be attributed to the difference in effective use of infrastructure resources" and added that it "is the single most important explanator of differential growth performance" (Hulten, 1996). This suggests strongly that infrastructure is indeed an asset that can result into benefits when efficiently utilised. It is appropriate to conclude that if efficient use of infrastructure can make it worthy assets and inefficient usage yields penalties, then continuous inefficient use could make it a negative asset or a liability.

3.4. Budget

Budget is an "official statement by the government of a country's income from sources such as tax, trade and the proposed spending or expenditure (Oxford Advanced Learner Dictionary, 2010). It is a plan that outlines an organization's financial and operational goals (Ward, 2010).

Infrastructure budget must therefore represent a financial projection of the government's intention and plans to provide for the people a regime of infrastructure that will lead to an improvement in their quality of life and wellbeing. A budget plan therefore can act as:

- A window into the vision of that government
- A barometer for measuring its preparedness and seriousness
- An indicator of its real priorities (despite any other claims)

Budget 2009	
Budget value	$21.3 billion
Recurrent expenditure	$11.1 billion
Capital expenditure	$7 billion
Statutory transfer	$1.1 billion
debt service	$2 billion
Critical sectors	
Security and the Niger Delta	20%
education	8%
transportation	7%
agriculture and water	5%
energy	5%
Indebtedness (including federal/ state government debt, as percentage of GDP)	3%

Table 2 Nigeria priorities expressed in annual budget (Bureau of African Affairs, 2010)

Decipherable information from Table 2 indicates that Nigeria commits 5% of her budget to food production to satisfy her 140.4m population (NPC, 2006), a total of 15% of her budget to cater for her education and transportation infrastructure while committing 20% to security and the Niger-Delta in 2009.

3.5. Accountable Growth and Management of Public Infrastructure

It is appropriate for shareholders of a company to desire profitable actions from their elected board members (compare political leaders) and appointed managers (compare civil servants) and when this is not forthcoming, a shareholder may elect to opt out of such a company by liquidating his stocks, holdings or shares. Taxpayers as stakeholders in an economy do not have that same luxury or rights to just opt out. This means that people have better reasons to show more than passing interest in the way and manner their economy (money, resources and commonwealth) is being managed and be "assured that the money abstracted from their pockets have been administered with propriety and efficiency and without waste and extravagance" (Jones, 1984, p. 4).

3.6. State of Civil Infrastructure in Nigeria

Nigeria has a fairly extensive infrastructure of roads, railroads, airports, and communication networks (see Table 3). The road system is by far the most important element in the country's transportation network, carrying about 70 percent of the entire nation's cargo (Oni, 2010). Currently, many of the roads are in disrepair because of neglect, poor maintenance and years of heavy traffic. The Nigeria rail system has equally suffered a high degree of failures resulting from antiquated facilities and persistent mismanagement.

Sector	Size
Road network	Total: 193,200 km Paved: 28,980km (15%) Unpaved: 164,220km
Road responsibility	Federal: 17% State: 16% LGA: 67% (FMW)
Railroads	3,505 km (1.067-m gauge) 2008
Airports	Total: 52 (2010) With paved runway: 38 With unpaved runway: 16
Telephone	Landline: 1.308 million (2008) Mobile: 62.988 million (2008)
Electricity	Production: 21.92 billion kWh Consumption: 19.21 billion kWh (2007 est.)
Oil	Production: 2.211million bbl/day (2009 est.) Consumption: 280,000bbl/day (2009 est.) Proved reserve 36.22billion bbl (1 January 2009 est.)

Table 3: Nigerian critical infrastructure at a glance
Data source is CIA World Fact book except otherwise noted (CIA World Factbook, 2010).

Greater focus will be on road transport in this work because of its significant modal share in transportation.
For a population of 140.4million, Nigeria has huge infrastructure deficit while the existing ones are poorly maintained. For instance, visual observations and general reported experiences on the Nigerian roads showed that it is perennially plagued by potholes, sub-grade, shoulders and pavement total failure and general deteriorations despite being critically responsible for 70% (Oni, 2010) of the country's entire cargo. News reports have cited instances of passengers spending 2 to 3 days on the road (234Next, 2010). It is even considered one of the major causes of deaths in Nigeria, cause of huge economic loss (see Table 4) projected at $15b (adapted from Table 4 as explained later in this paper) by 2010 (all things being equal), active promoter of robberies (Costa, 2009), a clear testimony to inefficient infrastructure management and a strong indicator of governance failure; a position partly empirically corroborated by an opinion poll conducted under the supervision of Professor Idowu Sobowale of the Redeemers University (Odo & Alli, 2010). The CBN Research Department Occasional Paper Number 27 identifies "faulty designs, inadequate drainage system and poor maintenance culture" (CBN, April 2003) as some of the factors responsible for the state of these roads while Oni (2010) identified overuse and overload of the road with consequential 'excessive overburden pressure on the surface layer, sub-base and sub-grade components of the emplaced pavement' as clear factors responsible for the eventual dotting of the surface of even newly constructed roads with potholes barely few months after completion.

Type/Cause of Loss	Value
Annual loss due to bad roads (B)	N80 billion*
Additional vehicle operating cost resulting from bad roads (O)	N53.8 billion*
Total (V_{2003}) = B+O	N133.8 billion (economic loss due to bad road in 2003)

Table 4: Estimates of economic and growth loss due to Nigerian roads
**The Federal Ministry of Works (CBN, April 2003, p. 6)*

While the economic loss is expected to be nonlinear, it is assumed that the Federal Ministry of Works' estimate in 2003 (Table 4) took into consideration:

- Man-hour loss from typically spending an average of 5 hours on a 3 hour trip (sometimes higher).
- Trauma (health, wellbeing, psychological and emotional loss) and loss due to road congestion - example of Lagos is instructive where road congestion is generally known to result into wasting a whooping 8 hours on a 40min journey.
- Economic loss due to road crashes, i.e., the impact of Nigerian terrible roads on nation's death rate – vis-à-vis untimely deaths and crippling injuries due to road accidents - and by extension (1) lowering of life expectancy and (2) ultimate loss of productivity.
- Economic loss due to bad-road-promoted deaths and loss of properties resulting from increased instances of armed robberies. The latter refers to the unwarranted loss of lives, money, investments and properties due to the activities of armed robbers (compare Costa [2009]) who continuously take advantage of bad spots to waylay their victims.
- Loss occasioned by preference for more expensive vehicles considered to offer protection from bad roads (e.g., land cruiser jeeps and similar four runner vehicles) often procured by successive government officials who cite bad roads as reasons for the additional cost even though the financial difference is staggering.

An attempt is made below to project this loss value (Table 4) into year 2010 with the assumption that the behaviour of all critical parameters remain relatively similar.
With the fall of crude oil prices, let it be further assumed that there are no other factors that will affect the value of the economic loss or price level in Nigeria during this period (2003-2010), the value of this economic loss in 2010 based on inflation rate of 0.5 would be similar to the outcome empirically established below:
Set EL_{2010} as Economic Loss in 2010.
Set $EL_{2010} = V_{2003}*(1+R)^{\wedge}N$ ..... Equation 1
Where V_{2003} = Loss value in 2003, R = inflation rate and N = number of years.
V_{2003} = N133.8 billion
$\Rightarrow EL_{2010}$ = N133.8 billion$*(1+0.5)^7$
N2,286,098,437,500 = $14,899,400,000 per annum by year 2010 (OANDA, 2010)

4. Discussion

4.1. Nigeria Infrastructure and the 2020 Cut Off Year
Nigeria's budget for 2009 is $21.3b (see Table 2). While the budget indicates that more could be done for infrastructure in terms of allocation, the amount set aside was still appreciable. The infrastructure deficit of Nigeria is however alarming while the conservative estimate of economic and growth loss due to the road component of the nation's infrastructure is $15b per annum using present value of 2003 estimate (compare Table 3 and Table 4). The authors observe that two major factors are responsible for the deplorable state of the nation's infrastructure:

- Absence of targeted and project-specific marshal plan dedicated to the growth of her infrastructure aided by a leadership will to pursue the implementation of same.
- The impact of corruption. But while would the authors identify 'absence of plan' in view of the fact that Nigeria does not seem to lack development plan at any single year especially since the advent of democracy in 1999?

Prof. Dora Akunyili, the former Federal Minister of Information and Communication in a press briefing on the decisions of the Federal Executive Council meeting of 25th August 2010 announced that the federal government has approved the first trimester plan covering 2010 to 2013 of the Nigeria Vision 20:2020 as well as the Draft Bill for an Act to make Development Planning Compulsory for all Tiers of Government in Nigeria. She also revealed that the three trimesters of development plans – 1st Implementation (2010-1013), 2nd Implementation (2014-2017) and 3rd Implementation (2018-2020) would cost N32 trillion (Akunyili, 2010).

The briefing however did not include details and specifics as far as infrastructure is concerned that the government seeks to embark upon in order to achieve the v2020 target.

The Central Working Group on the implementation of the 1st trimester plan however listed infrastructure among other core areas of focus as:

- macroeconomic framework -macroeconomic model
- productive sector
- human development
- infrastructure
- knowledge based economy
- governance
- regional development
- monitoring and evaluation

The plan agrees that people are the basis of growth and targets a GDP of 900billion (USD) and a per capita income of 4,000 (USD) for Nigeria stating that "Bridging the Infrastructure gap to unleash economic growth and wealth creation" is one of its main policy thrust as well as advocated for a 41% private sector funding of the plan (Usman, 14 June 2010).

Usman explained that the plan (v2020) encompasses federal, state and local government authorities and listed the source of funding for the N32 trillion required to achieve the v2020 as shown in Table 5.

Category (Funding source)	Amount (N'trn)
Federal	10
States and Local Government Areas	9
Private Sector	13

Table 5: Sources of funding for Nigeria's Vision 2020

It is however pertinent to state that prior to the vision 2020 plan, Nigeria adopted the National Economic Empowerment and Development Strategy (NEEDS) which commenced in April 2003. NEEDS too was designed to provide a framework for a nationally coordinated strategy at federal, state and local government level towards accomplishing the socio-economic and industrial development of Nigeria – basically what v2020 seeks to accomplish. Under the NEEDS plan, an important strategy for promoting private enterprise is the need for private sector participation in the financing and provision of infrastructure. NEEDS was also designed to encompass the states and the Local Government as SEEDS and LEEDS respectively.

4.2. Understanding the problem

Nigeria perennially suffers from penchant for unending diagnosis and an evolution of cosmetic spins as solutions to problems that are at the core of her developments. A development plan that would leapfrog her growth would itemise its vision, not as arrays of fancy slogans, but in carefully articulated and specific acreage by acreage and time-based missions for her most pressing growth determining factors – her infrastructure. This is the core of governance inefficiency addressed in 2.2.5 which prevent people from getting assurance that "the money abstracted from their pockets" will be "administered with propriety and efficiency" as opined by Jones (1984, p. 4). Lack of emphasis on models built upon accountability and measurable growth indices makes Nigeria development policy plans mere glossy presentations that will in no time be survived by yet another – and the cycle continues with the ultimate result of weakening societal trust and promotion of corruption as advanced by Uslaner (2002) – see 2.4.

Institutionalisation of various types of policies under different nomenclatures has become Nigeria's major characteristic. Both NEEDS and v2020 so far failed to crystallize their plans into quantifiable and 'street man' measurable indices that connect with the infrastructure requirement of Nigerians and that can therefore offer hope to her citizenry and address the shortfall in her infrastructure profile (see Table 3). That is, providing time-driven quality and quantity-based mission-specific plan for her 3,505 km railway, her 193,200km road network, her health institutions, her electricity grids, and her school systems etc so that she does not suffer growth penalties from reverse loss or smaller benefit accruals which are consequences of inefficient infrastructure governance as noted in 2.2.3 (compare Hulten, 1996). If we compare the framing of a similar vision 2020 in Malaysia as far back as 1993 stating that her goal was to achieve "a developed nation status by the year 2020" (MWM, 2010). This immediately evokes an aspiration to build modern infrastructure – the type that distinguishes the developed nations.

For example, road transport policies frameworks that resulted in the establishment of such agencies as the Federal Road Safety Corp established by Decree 45 of 1988 (Ohakwe, Iwueze, & Chikezie, 2011), the Vehicle Inspection Officers (VIOs) etc are good policies. They will however fail (as they have) in accomplishing their objectives if the road infrastructure itself is continually neglected (compare CBN, 2003 in 2.3).

4.3. Development Role Model 1

The implementation of the American Recovery Act is a good example of how a government can transparently tie its development plans to measurable items that the common man can relate with and that will have direct positive impact on growth.

For instance the breakdowns in Table 6 are facts about the US Recovery Act 2009 which distributes the $787 billion of the recovery effort. A further drill down of information is possible and this will provide the specifics of the items or projects categories as they affect roads, railway, airports, education, health etc in a way that the number of employment generated from these activities can be estimated at the onset (plan stage) and ascertained at implementation. The plan approved by the US congress for the Recovery Act was detailed and project specific. This information is published for the benefit of the public and as a direct way of ensuring accountability and transparency and that equal opportunities exist for all who might be interested in these projects:

Category	Total Recovery Act Funds	Funds Paid Out
Tax Benefits	$288B	$223B
Contracts, Grants, Loans	$275B	$145B
Entitlements	$224B	$144B

Table 6: Distribution of funds of the American recovery Act 2009 (Recovery.Gov, 2010)

On the mighty importance of transparency and accountability, Earl E. Devaney, the chairman of the Recovery Accountability and Transparency Board, which oversees spending under the American Recovery and Reinvestment Act of 2009, said "Government can be a mysterious institution. Indeed, the pathway to understanding how your tax dollars are being spent can be a very difficult journey, much like trying to find your way out of the ancient catacombs. That's one reason why transparency is so vital in an open government" (Recovery.Gov, 2010).

4.4. Development Role Model 2

Other infrastructure development role models are Malaysia and Singapore.

Category	Size
Population	23.3 million*
Ethnic composition	Diverse (60 ethnic or culturally differentiated groups)*
Road network infrastructure	90,129km
Share of paved road of total road network	71,201.91km (79%)
Share of road transport of total passenger and goods transport	96%$^{\infty}$

Table 7: Malaysia at a glance

Except otherwise stated, data for Table 7 was derived from information made available on the portal of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) by the Highway Planning Unit, Ministry of Works Malaysia (MWM) on the Status of Financing Highway Infrastructure in Malaysia (MWM, 2010).

* Sourced from Arshad (2007).

$^{\infty}$ Compare with Nigeria's 70 percent of the entire nation's cargo.

Development of the Malaysian public infrastructure was deliberate with the scale and pattern of infrastructure development being defined by two overriding objectives, namely; (1) the recognition that infrastructure is vital for the economic development of the country, and (2); to develop infrastructure to serve socio-economic ends of Malaysians with emphasis on providing infrastructure to promote the development of the less developed regions of the country, including rural areas (Naidu, 2007).

Naidu (2007) noted that after independence, the Malaysian Government built on the initial stock of infrastructure thereby greatly expanding and modernising all categories of infrastructure facilities so that demand for infrastructure can meet infrastructure provision. The government made considerable progress in making infrastructure available in the less developed parts of the country.

"Malaysia's developed infrastructure is one of the main attributes that have placed her among South-East Asia's most rapidly industrializing nations" (Arshad, 2007). Malaysian infrastructure required very large investments. The infrastructure sector has received the largest share of public sector development expenditure in every one of the Malaysia Plans. But since the early 90s, resource constraints compelled the Malaysian government to encourage private sector participation in infrastructure development. Recently however, the private sector in Malaysia has been investing more in infrastructure than the public sector. This "good combination between public and private sectors has brought the country nearer to its stated vision of achieving a develop nation status by the year 2020" (MWM, 2010).

Singapore is small and resource-constrained. Her economic development was substantially state-directed capitalism (Anwar, Sajid, Bob, Zheng, & Mingli, 2004) with "continued dominance of multinationals and government-linked corporations" (Lim, 2008). Lim however identified infrastructure investment "to enhance a location's overall attractiveness to business" as one of the Singapore and other Asian tigers' state strategies embedded in their market-shaping policies responsible for the growth of their economies. Singapore also deliberately pursued modernization and efficiently built infrastructure that today rank her as one of the best destinations in Southeast Asia. This made the Singapore experience a useful lesson in development – for instance the development of her "international airport and the mass rapid transit systems" (Yeo, 1995).

4.5. Lessons from Malaysia and Singapore

The following are three clear lessons from the Malaysian and Singaporean experiences:

- Infrastructure growth and the resultant economic benefit are a result of deliberate planning with focus on (a) making the countries attractive enough to invite and retain investment (b) develop infrastructure needs of less developed regions and ultimately eliminate infrastructure disparity.
- Infrastructure development by government preceded private sector intervention (case of Malaysia is instructive) even though most of Singapore's development continue to be government directed. This might not be sustainable in the long run.
- Private sector intervention is good for sustainability and bridging infrastructure finance gap (example of Malaysia). Singapore may not be under similar strain because it is mainly a city state with a population of 5 million (Statistics Singapore, 2010).
- Nigeria has 193,200km of road network of infrastructure while Malaysia has 90,129km of same. 15% (28,980km) is paved of Nigeria's total road network while 79% (71,202km) is paved of Malaysia's total road network. Nigeria must deliberately pursue a policy of major upgrade and modernization of her infrastructure. Figure 1 puts this in perspective when Nigeria is placed side by side with a nation like Malaysia.
- Successful private sector intervention in Nigeria would respond to such questions as: Does the privatization process guarantee equal access to opportunities? What is the built-in accountability process? Does it possess internal capacity for check and balance? Will it be within standard and reasonable cost? Please see 3.2.3.

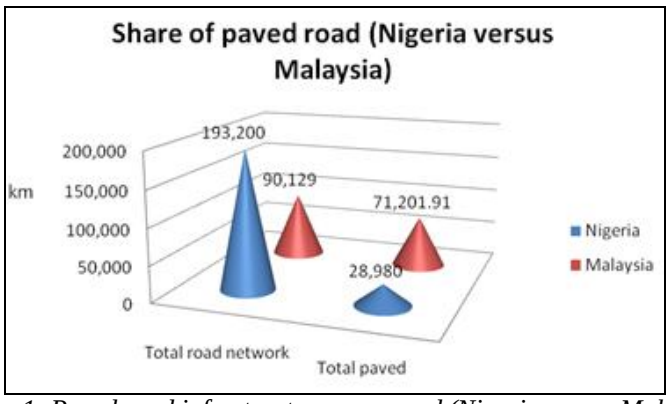

Figure 1: Paved road infrastructure compared (Nigeria versus Malaysia)

4.6. Private sector role

The private sector is important to economic growth. Some of the ways the private sector has been noted to be involved in infrastructure management are via concession, outsourcing, management contracts and public-private partnership (PPP), a term considered "less contentious" (Savas, 2000, p. 2). In this context, the goal of PPP is the "debureaucratization of public service" (Dunn-Cavelty & Suter, 2009). The arrangement can be Build, Operate and Transfer BOT or similar variants. The private sector is able to help fast-track and maximize infrastructure development. Gómez-Ibáñez (2003) acknowleges the role played by the private sector in many countries in the buidling of national infrastructure in the 80s and 90s in the hope that "market-based incentives would control costs and improve the quality of essential services". Developing countries equally benefited (Gómez-Ibáñez, 2007, p. 1). He was however quick to note that caution would have to be exercised in view of certain recorded high profile failures with such private sector interventions and the challenges posed by natural monopolies that made competition and fairness impractical.

4.7. Examples of failed private sector interventions

The list below is that of some private sector "high profile failures" (Gómez-Ibáñez, 2007, pp. 4-5) identified by Gómez-Ibáñez except where otherwise stated:

- Bankruptcy of roughly two dozen private toll roads in Mexico in 1994
- Seizure of an elevated private expressway in Bangkok in 1993
- Cancellation of Enron's concession to build a power plant at Dabhol by the State of Maharashtra in India in 1994
- Exposure of charges of corruption in the independent power production contracts in Indonesia, Pakistan and the Philippines following the Asian financial crisis of 1997-1998.
- Bankruptcy of M1/M15 toll road concession in Hungary for lack of traffic in 1998
- Bankruptcy of Railtrack, the private company responsible for Britain's entire railway infrastructure in 2001
- Bankruptcy of Metronet, one of two companies with 30-year contracts to renew and maintain the London Underground's infrastructure and subway trains in 2007
- Ongoing controversy over the 27-mile stretch M6 Toll which opened in the UK in 2003 as motorists refused to pay to use it as expected with a claim that Midland Expressway, the road's operator, has lost around £26m a year since it opened (Sky News, 2010).
- In Africa, management or concession contracts have been cancelled in a number of countries, but the best-known disputes involve Senegal (2000), Tanzania (2005), Mali (2005), and; IN NIGERIA -
- The revocation of toll collections concessions by private companies on Nigeria's federal highways with a presidential fiat coupled with a directive for urgent demolition of all such toll gates in 2004 (Bisiriyu, 2010).
- Repeated cancellation of concession agreements on the Ajaokuta Steel Company Limited (ASCL) between 1999 and 2007 and the charges of corruption valued at N105billion expended within 20 months in the NITEL-Pentascope management contract signed on March 18 2003 (Balancing-act Africa, 2003) which necessitated the intervention of the legislature (Ojeifo, 2008) in Nigeria.

These failures were enough "to discredit this reform in many quarters" (Gómez-Ibáñez, 2007, p. 1). But despite the failures, it is instructive to state that collaboration between government and the private sector (e.g., PPP) is an important solution to nations' quest for infratsructure growth (Dunn-Cavelty & Suter, 2009). To reduce the propensity for failure, Gómez-Ibáñez (2003) made "a strong case for favoring market-oriented and contractual approaches - including private contracts between infrastructure providers and customers as well as concession contracts with the government acting as an intermediary - over those that grant government regulators substantial discretion" (Gómez-Ibáñez, 2003). In the Nigeria context, this implies a direct protection of the public (people) while at the same time providing an effective legal protection for the investment of private sector players, save them from arbitrary actions from government which might be politically motivated – and ultimately not applying private sector intervention as a means to merely transfer cost (from government to the private sector) as well as strictly keeping within bound in terms of costs. While government has enacted the Infrastructure Concession Regulatory Commission law, distinctive anti-trust law that protects competition and the public is very vital. It has been observed that "competition law is the strong pillar upon which every credible liberalisation programme no matter its hue or configuration must rest" (Dimgba, 2004) because a competitive environment is more likely to drive efficiency upward since private involvement in public infrastructure provision "*is likely to be more successful if it generates real efficiency gains rather than simply transferring costs among parties, if the systems of regulating the private companies are politically sensitive as well as technically competent, if the costs and constraints of private capital are no higher than they need be and if we are willing to adopt more modest and gradual schemes in difficult circumstances*" (Gómez-Ibáñez, 2007, p. 1).

The Lekki concession project in Lagos by the Lagos State government, the Murtala Mohammed International Airport Terminal 2 concession project by the federal government of Nigeria and similar ongoing effort in Nigeria will benefit from properly defined legal framework to avoid any pitfall. This will lead to reduced systemic corruption and ensure that real efficiency is gained through privatization as well as ensure that the processes involved are competitive.

4.8. Infrastructure Management

In Nigeria, Government Ministries and Parastatals both at State and Federal levels have always tried to maintain their infrastructures at a minimum cost but often times ended up spending more than the budget due to poor maintenance culture and use of unsystematic approach . A good infrastructure management enables the systematic, coordinated planning and programming of investments or expenditures, design, construction, maintenance, rehabilitation, renovation, operation, and in-service evaluation of physical facilities (FERREIRA AND Duarte, 2005). A computerised tool that can readily integrate into this system framework is Geographical Information System(GIS) which according to Esri 2011, is capable of integrating hardware, software, and data for capturing, managing, analysing, and displaying all forms of geographically referenced information (fig2a&2b) and helps in understanding and visualising data to guide in make decision and policy formulation based on the best information and analysis .

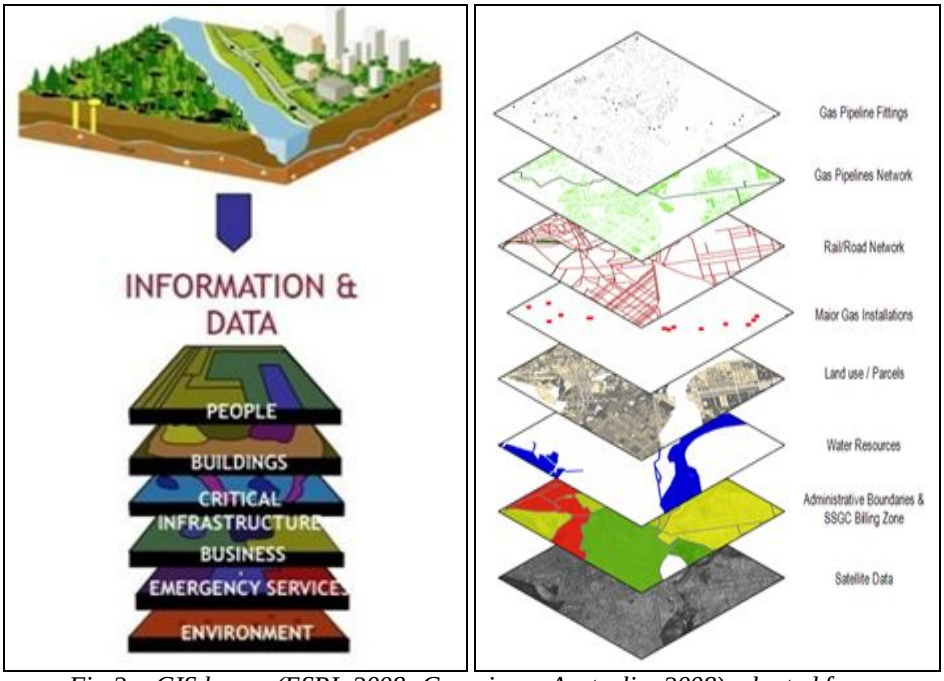

Fig 2a: GIS layers (ESRI, 2008; Geoscience Australia, 2008) adapted from www.gmat.unsw.edu.au/currentstudents/ug/projects/...
Fig 2b: GIS layers (SSG, 2014)

The use of GIS has become a key technology for the automation and management of infrastructures in the developed Countries for they have long realized that by understanding the concept of geospatial technology and people's relationship to location and infrastructure that a meaningful decision on infrastructure management can be made and that accounted for the reason why much money is been invested into infrastructure management using the dynamic approach, GIS.

5. Conclusion

Public Infrastructure represents the heartbeat of the commonwealth. Public infrastructure is the life-force of a society, the active connecting nodes that enables socio economic interoperability. It is a fact of life that everybody cannot be rich. But a society with good infrastructure can guarantee that everybody will have access to riches (at least riches of the commonwealth – the infrastructure). Dwelling partly upon these views and prior works and findings by others as articulated in this work, this paper theorises that development based on upgraded and modernized public infrastructure as the main trigger of growth in Nigeria is sacrosanct.

It is a myth to claim that government has no business in business. The object of governance is the people. The targets of business are the people. It follows therefore that it is government's business (as a fundamental attribute) to have interest in business (or businesses) that will ultimately affect its people. The business of business is thus a fundamental duty (or business) of government. The zero-percent proponents' myth of 'Government has no business in business' originates from a limited application of the concept of business. It is also a subliminal slogan and a preferred selling point of few privileged private sector players in the quest for more profit. It is however the nature of government's involvement in business that must be properly defined in a manner that will promote efficiency, promote competition and ultimately channel the yields of its 'business' involvement to improve the wellbeing of the people – and paradoxically, the growth of businesses in its domain. The government and business dialectic suggest that government must invest in and efficiently manage the business of growing, within its economic name-space, businesses that will sustainably handle and manage its *own* businesses. It is a win-win scenario.

For developing nations, the powerful tool to grow these businesses is the provision of qualitative infrastructure utilizing the stock of such a nation's advantage (example of Malaysia and Singapore). For developed nations, infrastructure may not have similar impact on their growth but for developing economies, the impact of infrastructure on growth is appreciable. Developing nations must identify their areas of advantage and utilize this in the development of their infrastructure. In the case of Nigeria, her natural advantage is her crude oil. It is therefore strongly recommended that she heavily invest the proceeds of her crude oil in her infrastructure thereby making both the nation and the infrastructure so provided attractive enough to woo and retain continuous private sector participation and investment (both internal and external). A nation that gets her infrastructure right (road, water, electricity etc) will attract good investment and quality human resources. She will also be able to retain these so that the latter can push export and attract FDI.

For the first trimester of Nigeria development plan (2010-2013), it is hereby suggested that the nation embraces a deliberate government led infrastructure development programme.

Normally, government led infrastructure development has its limit due to limitation in resources. This is why this stage is very critical in order to set required standard in efficiency that the private sector would match and expectedly surpass.

A good legal framework is important for infrastructure development particularly for the adoption of a model similar to BC canvassed in this work or even towards having sustainable private sector participation. Often, the interest of the state, based upon the reason for its existence, is at variance or in some instances of extremes - diametrically opposed to the interest of the private sector, based upon the latter's different primary goal and objectives. The private sector is profit driven whereas the fundamental reason for the existence of the state is for the wellbeing and comfort of its citizenry. Anti-trust law will engender competition such that via outsourcing or some variants of PPI (competitively and transparently) with properly defined regulations through well known and published checklists (quantifiable checklists), everybody would know that they can be part of the process and that it is not the exclusive preserve of those that are well 'connected'.

Heavy infrastructure investment will increase direct employment opportunities. Good road network will reduce the economic loss incidental to the nation's highways and reduce congestion. Increase in employment opportunity will reduce the number of young people available as recruits into the ranks of armed robbers and similar criminal activities.

Road transport was only used as an example in this work because of its significant modal share in transportation. The above model can be applied with variations to address the requirement needed to reposition other types of infrastructure and other means of transport.

6. References

1. 234Next. (2010). Lagos-Benin Expressway takes toll on passengers. Retrieved September 29, 2010, from 234Next: http://234next.com/csp/cms/sites/Next/Home/5624570-146/lagos-benin_expressway_takes_toll_on_passengers.csp
2. Agénor, P.-R. (2010). A theory of infrastructure-led development. Journal of Economic Dynamics and Control , 34 (5), 932-950.
3. AHDEL. (2010). Definition of infrastructure. Retrieved August 28, 2010, from American Heritage® Dictionary of the English Language (Available in colaboration with Yahoo Education Referencing): http://education.yahoo.com/reference/dictionary/entry/infrastructure
4. Akunyili, D. (2010, August 25). FEDERAL EXECUTIVE COUNCIL RESOLUTIONS . Retrieved September 4, 2010, from FEDERAL MINISTRY OF INFORMATION & COMMUNICATIONS: http://www.fmic.gov.ng/News.asp?index=1650&index2=13
5. Anwar, Sajid, Bob, C., Zheng, & Mingli. (2004). Government Policies and the Growth of the Manufacturing Sector in Singapore. Journal of Business and Management .
6. Arshad, S. I. (2007). MALAYSIA. Retrieved from Economic Research Institute for ASEAN and East Asia.
7. Balancing-act Africa. (2003). NIGERIAN GOVT APPROVES US$2M MOBILISATION FEE FOR PENTASCOPE - Issue no 155. Retrieved August 4, 2010, from Telecom, Internet and Broadcast in Africa - Balancing Act: http://www.balancingact-africa.com/news/en/issue-no-246/money/nitel-pentascope-squandered-n105bn-in-20-months-according-to-ex-nitel-man
8. Bisiriyu, R. (2010, March 30). FG to reintroduce toll gates, fuel tax. Retrieved September 4, 2010, from The Punch: http://www.punchng.com/Articl.aspx?theartic=Art201003303451532
9. Bruijne, M. D., & Eeten, M. V. (2007). Systems that Should Have Failed: Critical Infrastructure Protection in an Institutionally Fragmented Environment. Journal of Contingencies and Crisis Management , 15 (1), pages 18–29.
10. Bureau of African Affairs. (2010, May 12). Bureau of African Affairs: Background Note: Nigeria. Retrieved August 30, 2010, from US Department of State: http://www.state.gov/r/pa/ei/bgn/2836.htm
11. Calderon, C. A., & Servén, L. (2004). The Effects of Infrastructure Development on Growth and Income Distribution. World Bank Policy Research Working Paper Series , 3400, http://ssrn.com/abstract=625277.
12. CBN. (April 2003). HIGHWAY MAINTENANCE IN NIGERIA: LESSONS FROM OTHER COUNTRIES. Central Bank of Nigeria, RESEARCH DEPARTMENT OCCASIONAL PAPER NO. 27. Abuja: Central Bank of Nigeria.
13. CIA World Factbook. (2010, August 19). Africa: Nigeria. Retrieved September 3, 2010, from CIA World Factbook: https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html
14. Costa, G. d. (2009, November 26). Africa: Nigeria's Bad Roads Are Getting Worse. Retrieved September 2, 2010, from Voice of America: http://www.voanews.com/english/news/africa/Nigerias-Bad-Roads-Are-Getting-Worse-74805987.html
15. Dimgba, N. (2004). THE URGENT NEED FOR ANTI-TRUST LAW. London: International Bar Association - Global competition forum.
16. Dunn-Cavelty, M., & Suter, M. (2009). Public–Private Partnerships are no silver bullet: An expanded governance model for Critical Infrastructure Protection. International Journal of Critical Infrastructure Protection , 2 (4), 179-187.
17. Esfahani, H. S., & Ramı´rez, M. T. (2003). Institutions, infrastructure, and economic growth. Journal of Development Economics , 70 (2), 443–477.
18. Esri. (2011). GIS Overview, http://www.esri.com/what-is-gis/overview.
19. Esri.(2008). Role of GIS- University of New South Wales, http://www.gmat.unsw.edu.au/currentstudents/ug/projects/...
20. Ferreira, A and Anab ela Duarte. (2005) A GIS-Based Integrated Infrastructure Management
21. A paper presented at the FIG Working Week in Cairo, Egypt April 16-21, 2005.
22. http://www.fig.net/pub/cairo/papers/ts_37/ts37_09_ferreira_duarte.pdf
23. Ford, R., & Poret, P. (1991). INFRASTRUCTURE AND PRIVATE-SECTOR PRODUCTIVITY. Organization for Economic Cooperation and Development (OECD), Economic Studies No. 17. OECD.

24. Francois, J. F., & Manchin, M. (January 2007). Institutions, Infrastructure and Trade. CENTRO STUDI LUCA D'AGLIANO (Centre for Development Studies), UNIVERSITA' DEGLI STUDI DI MILANO, Milano, Italy.
25. Gómez-Ibáñez, J. A. (2007). Private Infrastructure in Developing Countries: Lessons from Recent Experience. WORKING PAPER NO.43 - Workshop on Global Trends and Challenges, September 28 and 29, 2007 (pp. 1-44). New Haven: Yale Center for the Study of Globalization, New Haven, Connecticut.
26. Gómez-Ibáñez, J. A. (2007). Private Infrastructure in Developing Countries: Lessons from Recent Experience. In C. o. Development (Ed.), WORKING PAPER NO.43 - Workshop on Global Trends and Challenges, September 28 and 29, 2007 (pp. 1-48). Washington: The International Bank for Reconstruction and Development / The World Bank.
27. Gómez-Ibáñez, J. A. (2003). Regulating Infrastructure: Monopoly, Contracts, and Discretion. Boston: The Harvard University Press.
28. Hulten, C. R. (1996). Infrastructure Capital and Economic Growth: How Well You Use it May Be More Important than How Much You Have. Hulten, Charles R., Infrastructure Capital and Economic Growth: How Well You Use it May Be More Important than HowNBER Working Paper Series , 5847, http://ssrn.com/abstract=225632.
29. Husock, H. (2008, October 2). The Private Role in Public Infrastructure: Opening Remarks. Opening remarks by the Vice President for Policy Research, Manhattan Institute . (http://www.thirteen.org/forum/topics/the-private-role-in-public-infrastructure-opening-remarks/135/, Trans.) Manhattan, New York, USA.
30. Johansson, J., & Hassel, H. (2010, July). An approach for modelling interdependent infrastructures in the context of vulnerability analysis. Reliability Engineering & System Safety .
31. Jones, J. (1984). Public Sector Accounting. London: Pitman Press.
32. Lim, L. (2008). Singapore's Economic Growth Model – Too Much or Too Little? Singapore Economic Policy Conference, (pp. 1-11). Michigan.
33. Moteff, J., & Parfomak, P. (October 1 2004). Critical Infrastructure and Key Assets: Definition and Identification. Federation of American Scientists, Resources, Science, and Industry Division. Washington: Congressional Research Service - The Library of Congress.
34. MWM. (2010). Status Paper on Financing Highway Infrastructure In Malaysia. Retrieved September 10, 2010, from The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP): http://www.unescap.org/ttdw/common/Meetings/TIS/Regional%20AH%20Country%20papers/Malaysia-status.pdf
35. Naidu, G. (2007). Infrastructure Development in Malaysia. In N. Kumar, ERIA Research Project 2007 No. 2:- International Infrastructure Development in East Asia: Toward Effective and Balanced Regional Integration (pp. 204-227). ERIA.
36. NPC. (2006). National Results - Population by states and sex. Retrieved August 1, 2010, from National Population Commission: http://www.population.gov.ng/files/nationafinal.pdf
37. OANDA. (2010, September 15). Currency Converter. Retrieved Sepember 15, 2010, from OANDA Currency Converter Naira to USD (N153.436:$1): http://www.oanda.com/currency/converter/
38. Odo, A., & Alli, T. (2010, July 12). Bad roads, cause of accidents in Nigeria. Retrieved September 3, 2010, from The Punch Newspaper: http://www.punchng.com/Articl.aspx?theartic=Art2010071203371
39. Ohakwe, J., Iwueze, I., & Chikezie, D. (2011). Analysis of road traffic accidents in Nigeria: A case study of Obinze/Nekede/Iheagwa road in Imo State, Southeastern, Nigeria. Asian J. Applied Sciience , 4, 166-175.
40. Ojeifo, S. (2008, July 31). This day - Nigeria: Senate Moves to Probe Pentascope/Nitel Deal. Retrieved August 4, 2010, from This Day via AllAfrica archive: http://allafrica.com/stories/200807310403.html
41. Oni, O. A. (2010). Tackling Road Traffic Congestion in a Developing Country – A Contemporary Approach. Journal of Applied Sciences Research , 6 (5), 529-542.
42. Oxford Advanced Learner Dictionary. (2010). Definition of budget noun from the Oxford Advanced Learner's Dictionary. Retrieved August 30, 2010, from Oxford Advanced Learner Dictionary: http://www.oxfordadvancedlearnersdictionary.com/dictionary/budget
43. Oxford English Dictionary. (2010). Infrastructure, Online . (Oxford University Press) Retrieved July 20, 2010, from Oxford Dictionaries: http://www.askoxford.com/concise_oed/infrastructure
44. Prud'homme, R. (2005). INFRASTRUCTURE AND DEVELOPMENT. Lessons of Experience (Proceedings of the 2004 ABCDE - Annual Bank conference on Development Economics) (pp. 153-181). Washington: The World Bank and Oxford University Press.
45. Recovery.Gov. (2010, August 27). Home Page of Recovery.Gov. Retrieved September 4, 2010, from Recovery.Gov: http://www.recovery.gov/Pages/home.aspx
46. Savas, E. S. (2000). Privatization and Public-Private Partnerships. New York: Chatham House Publishers.
47. Sky News. (2010). Britain's first privately-built motorway, which was hailed as the answer to congestion, has been branded an expensive flop. Electronic, London.
48. SSG. (2014). Geographical Information System, Sui Southern Gas Company Limited,
49. http://www.ssgc.com.pk/ssgc/projects/gis.php
50. Star, S. L. (1999). The Ethnography of Infrastructure. American Behavioural Scientist , 43 (3), 377-391.
51. Statistics Singapore. (2010, September 14). Singapore Department of Statistics. Retrieved September 14, 2010, from Statistics Singapore: http://www.singstat.gov.sg/stats/latestdata.html#12

52. Sullivan, A., & Sheffrin, S. M. (2003). Economics: Principles in action. Upper Saddle River 07458, New Jersey, USA: Pearson Prentice Hall.
53. Usman, S. (14 June 2010). Nigeria- Vision 20:2020. http://www.icrc.gov.ng/r/pr/d/su.pdf, Ministry of Economic Planning, Ministry of Economic Planning, Abuja.
54. Ward, S. (2010). Budget - Explore Small Business: Canada. Retrieved August 30, 2010, from About.com: http://sbinfocanada.about.com/od/management/g/budget.htm
55. World Bank. (2001). Beyond Transition, the newsletter about reforming economies - What Is Infrastructure. Retrieved August 24, 2010, from The World Bank : http://www.worldbank.org/html/prddr/trans/janfebmar03/box1pg3.htm
56. Yeo, K. (1995). Planning and learning in major infrastructure development: systems perspectives. International Journal of Project Management , 13 (5), 287-293.
57. Young, D., & Keil, R. (2010). Reconnecting the disconnected: The politics of infrastructure in the in-between city. Cities , 27 (2), 87-95.