PRIVATE INVESTMENT IN ROAD TRANSPORT INFRASTRUCTURE IN SUB-SAHARA AFRICA THE WAY FORWARD

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Abstract
Roads dominate the transport sector in most African countries, carrying 80 to 90 percent of passenger and freight traffic. Moreover, they are the only means of access to most rural communities. This dominance is achieved even though the density of the region’s network is lower, both per person and per square kilometer of land area, than that of other world regions. The condition of the road system is also poor by international standards. Africa has huge infrastructure gaps due to tight government funding and scarce resources hence the way forward is to explore the

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INTRODUCTION
Sub-Saharan Africa’s road network comprises strategic trading corridors of not more than 10,000 Km that carries about $200 billion of trade annually. The road access rate is only 34 percent, compared with 50 percent in other parts of the developing world, while transport costs are 100 percent higher (African Union 2014). The World Bank’s just-released report “Africa Pulse” points out that closing the infrastructure gap in Sub-Saharan Africa would increase per capita GDP by 2.6% a year. Analysts have estimated that the total financing requirements is about $92 billion per annum. Only about half of this amount can be raised from domestic revenues, DFIs, PPPs, natural-resource-backed contracts, bilateral, and the like. PPPs have made a significant contribution to infrastructure development in the
private sector investment through PPP. In these difficult circumstances, the provision of secure funding for road maintenance and efficient implementation are critical to the effectiveness of the sector and to identify specific capacity constraints that have hindered the private sector’s participation in road infrastructure financing. The transport sector in sub-Saharan Africa requires spending of approximately $18 billion a year, half for maintenance, to build sufficient regional, national, rural, and urban road connectivity. Several literatures were review in a bid to Annalise and suggest possible alternatives to the burden and shortfall of private involvement in road infrastructure development in Sub-Saharan Africa. Today PPPs have emerged as an important mode of financing infrastructure projects in several developing countries. PPPs are “cooperative arrangements between governments and multinational corporations that are created to finance, construct and manage infrastructural projects. region, but they are not a panacea. They remain complex both in negotiation and execution. The region has ambitions for an intraregional road network, called the Trans-African Highway (TAH), which remains a pipedream due to poor maintenance on key segments. Such a network would require construction of between 60,000 and 100,000 kilometers of paved road (Foster and Briceño-Garmendia 2010). The region’s road density (204 kilometers of road per 1,000 square kilometers of land area) is substantially less than the world average of 944 kilometers per 1,000 square kilometers. That density is less than 30 percent of the next-lowest region, South Asia. Lack of proper and regular maintenance and upgrades resulted in depletion of the bulk of road surfaces. Furthermore, as of 2011, only about 15 percent of the region’s roads were paved, compared to 26% in Latin America and the Caribbean, 65% in East Asia and the Pacific, 76% in the Middle East and North Africa, and 86% in developing Europe and Central Asia (World Bank data). Nonetheless, the region’s road density to population is slightly higher than South Asia’s and only slightly lower than the Middle East and North Africa’s (Foster and Briceño-Garmendia 2010). Important to note is that Sub-Saharan Africa’s existing road network also is not fully used. For instance, traffic volumes are low and typically concentrated in major networks, averaging only about 500 vehicles per day, and the traffic volume in rural areas is only 30 vehicles per day except in Nigeria and South Africa, where it is higher (Gwilliam et al. 2008). Rural road networks typically carry less than 10 percent of the
classified network’s traffic except in Ethiopia, Malawi, and Nigeria, where they carry more than 20 percent. Though Africa accounts for only 2 percent of the world’s vehicle population, the road crash fatality rate estimated at 24.1 per 100,000 of population, is the highest globally. These can be attributed to road congestion, pavement conditions, and deterioration.

In the 2000s, two major positive developments gave fresh impetus to Africa’s infrastructure agenda the World Bank-sponsored AICD diagnostic study which filled the data gaps and produced an estimate of financing required for the continent’s infrastructure development ($93 billion per year), followed by the AFDB-sponsored Program for Infrastructure Development in Africa (PIDA) study which identified priority projects for immediate implementation. (AICD 2008)

Non-physical constraints including trucking cartels roadblocks are other major factors that significantly reduce the efficiency of transport of goods by road. Regionally, North and Southern Africa comparatively are way ahead in terms of their road network. The road network density in North Africa is estimated at 71.2 km road per 1,000 square km and has a higher prevalence of paved roads. The transport sector is very viable in Southern Africa because of the economic development in the region.

Table: 1 Road Network in Sub-Saharan Africa

<table>
<thead>
<tr>
<th>Region</th>
<th>Existing Network (km)</th>
<th>% Share</th>
<th>Paved Road (Km)</th>
<th>Paved Road % of Total</th>
<th>Paved Road in Good Condition %</th>
<th>Road Network Density per population(Km 1000 persons)</th>
<th>Road Network Density Per Land Area Km/1,000Km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Africa</td>
<td>344,083</td>
<td>12.1</td>
<td>79,139</td>
<td>23.0</td>
<td>58.7</td>
<td>2.1</td>
<td>36.5</td>
</tr>
<tr>
<td>Eastern Africa</td>
<td>850,710</td>
<td>30.0</td>
<td>250,959</td>
<td>29.5</td>
<td>49.0</td>
<td>1.2</td>
<td>127.9</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>998,334</td>
<td>35.3</td>
<td>353,410</td>
<td>35.4</td>
<td>47.8</td>
<td>5.5</td>
<td>99.8</td>
</tr>
<tr>
<td>Western Africa</td>
<td>638,982</td>
<td>22.6</td>
<td>116,934</td>
<td>18.3</td>
<td>43.2</td>
<td>2.3</td>
<td>83.7</td>
</tr>
<tr>
<td>SS/Africa Total</td>
<td>2,832,109</td>
<td>100.0</td>
<td>800,442</td>
<td>28.3</td>
<td>48.6</td>
<td>2.7</td>
<td>-</td>
</tr>
</tbody>
</table>

Sub-Saharan Africa ranks at the bottom of all developing regions in virtually all dimensions of infrastructure performance. The region, which houses almost one-
seventh of the world’s population, has a score of 2.91 in the infrastructure category of the World Economic Forum’s (WEF’s) Global Competitiveness Report 2018. This score clearly states that there is a severe infrastructure bottleneck to be addressed. The region has some inherent characteristics that may enhance the potential role of infrastructure for its economic development notably, the large number of landlocked countries, which are home to a major proportion of the region’s total population (about 40 percent), and the remoteness of most of the region’s economies from global market centers (Calderon and Serven 2010). The need of the hour for Africa today is to address huge infrastructure deficits that crippled the continent, which include road and rail connectivity, access to power, healthcare and telecom, among others, and to create enabling environment for growth and development. Improved transport technology and transport networks, through its effects on transport costs, access and connectivity have been major factors underpinning economic growth and opening up of markets and economic activity.

Problem statement
Progress on the ground on improving connectivity (via better regional infrastructure and integration) has been and continues to be grossly inadequate. All of the key stakeholders, the African leaders, countries and donor agencies have grappled with this challenge, all with limited success. Reasons for the lack of progress are complex and varied: inadequate data, lack of programs and plans, weak political commitment, inadequate financing, weak governance environment, corruption, environmental issues, etc.

Aim: the main aim of this thesis is to identify specific capacity constraints that have hindered the private sector’s participation in infrastructure financing.

Objective
• Take stock of the state (access, quality, and costs) of infrastructural development and financing.
• Assess infrastructure’s role in economic performance.
• Develop a clear and logical framework for institutional and human resource capacity enhancement to boost infrastructure financing.

Literature Review
Africa’s development is highly dependent on an adequate and reliable road system. Good-quality road connections can greatly expand access to jobs,
markets, schools, and hospitals (World Bank Report). Especially for rural communities, a road is often an essential lifeline linking isolated villages to economic opportunities and services. The low density and poor condition of the existing road infrastructure act as a serious constraint to the growth of the region. At present, only one-third of rural populations live within two kilometers of an all-season road in Africa, which is the lowest accessibility in case of developing countries. Insufficient funds for maintenance of existing roads further accelerate the deterioration of road network in the region, leaving many roads in poor condition.

Road transport is the principal mode of motorized transport in the region, accounting for over four-fifths of freight and passenger traffic in Sub-Saharan Africa, reflecting low availability of railway lines within the region (except for the Republic of South Africa). Currently, around 27 countries in Sub-Saharan Africa have road funds to support funding of new roads and maintenance of existing roads and around 20 road agencies for the sustainable management of road network. Increased financing in this sector could support the activities of road funds and road agencies, along with setting up funds in the rest of the countries. It has been estimated that transport prices are expected to fall by 30 percent from their current levels through trade facilitation measures that reduce transit time and costs to a minimum. Currently, the road sector draws the greatest share of transport sector funding in most African countries. But the current situation of the road network implies the fact that the funding levels are insufficient to meet the greater needs of the region. With the emphasis on regional integration, African governments have started thinking beyond development within borderlines. This has placed the focus on regional economic corridors, interlinking highways and ports in the region and hence providing comprehensive connectivity between international, national and rural networks. For example, East Africa is fast developing the trans-national road networks. The key transportation corridors in the East Africa totals to around 2,900 km connecting all five countries in the East African Community, the corridor approach is considered as the best way to reduce the time and cost of shipping freight on a regional as well as an international level. This would also reduce the costs associated with cross-border trade as well as reduce the time required for moving goods across borders. (Connecting Africa 2018)

To address those issues, we employ several approaches. First, we collate and analyze information from different academic and policy analysis sources to estimate the state of infrastructure financing and development in Sub-Saharan Africa. Various reports indicate that inadequate transport infrastructure adds
around 30-40 percent to the costs of goods traded among African countries. Since Africa is home to 16 landlocked countries, poor and underdeveloped transport infrastructure limits access to consumers, hamper intra-regional trade and drive up import and export costs. A better transport and logistics infrastructure provide efficient transport services to other sectors apart from mining and natural resources, resulting in a better standard of living for its citizens by bringing agricultural and manufacturing products to market. Although African governments, financial institutions, and the private sector have played an instrumental role in boosting regional integration, the levels of continental integration have remained relatively low. Intra-regional exports stood at 17.7 percent of the total exports of Africa in 2016, increasing from 11.7 percent in 1996. This is almost insignificant compared to 55.2 percent of intra-regional exports in the case of America, 59.4 percent in Asia, and 68.7 percent in Europe. Infrastructure insufficiencies play a major role in hindering Africa from fully reaching its potential trade and growth. The infrastructure requirements vary from region to region and from country to country, and hence an umbrella approach of meeting the gap is not possible. (Connecting Africa 2018)

**Methodology**

The research methods for this study fully analyze the nature and performance of the African road networks and their main commercial user, the road freight sector. It is based on three data sources from literature study

(i) a comprehensive road network survey undertaken specifically for the Africa Infrastructure Country Diagnostic (AICD)

(ii) an institutional database prepared and maintained as part of the Sub-Saharan Africa Transport Policy Program (SSATP), and

(iii) a fiscal cost study undertaken as part of the AICD

The basic country data including land area, population, GDP, vehicle fleet, and transport fuel consumed. Two kinds of country typologies are used to facilitate the presentation of the results. The first relates to factors completely exogenous to the road sector but that could nonetheless be expected to influence it significantly. These factors include macroeconomic circumstances (countries are classified as middle-income, low-income, or resource-rich; or as low-income and aid-dependent), geography (coastal, landlocked, or island), and terrain (flat and arid versus rolling and humid).

The second set of factors relates to policy variables, which are completely endogenous to the road sector. These factors include institutions (namely
whether the country has a road fund, a road agency, or both) and funding mechanisms (for example, the existence of a fuel levy and the level at which it is set).

In 2016 Africa infrastructure financing is US$ 62.5 billion new commitments were made to Africa’s infrastructure sector- both at national and regional level, a decline of around 21 percent compared to US$ 78.9 billion committed in 2015. Budget allocations from African national Governments accounted for the bulk of infrastructure financing commitment at US$ 26.3 billion (42.1 % share) in 2016. External finance commitments witnessed by Africa in 2016 is the lowest since 2010, mainly due to a US$ 14.5 billion reduction in reported Chinese funding and a US$ 4.9 billion fall in private sector investment. The members of Infrastructure Consortium for Africa (ICA) comprising the AfDB, Development Bank of South Africa (DBSA), European Commission (EC), European Investment Bank (EIB), G8 countries, the Republic of South Africa and the World Bank Group accounted for 29.8 percent of the financing in 2016.

Current Infrastructure Investment Requirements in Africa Annual estimates by various institutions vary from US$ 93 billion by the World Bank, US$ 100 -US$ 150 billion estimates by JICA, US$ 174 billion by G-20 and US$ 130- US$ 170 billion by the African Development Bank. Africa has huge infrastructure gaps due to tight government funding and scarce resources hence the need to explore the private sector through PPP.

Among low- and middle-income countries, three of the four BRIC nations Brazil, India, and China, excluding Russia have the greatest cumulative experience of public-private partnership projects and the most capital invested. Most countries in Asia and South America already have substantial private investment in infrastructure, as well as substantial project development and execution experience. Overall, Sub-Saharan Africa has a very modest presence and level of experience in this area, with only $77 billion in PPP projects, compared to $124 billion in Turkey alone, or $658 billion in South America (with Brazil alone representing $433 billion). These numbers highlight Africa’s enormous potential for growth going forward.

In an article published in the August 2016 issue of the African Journal of Management Research, authors Bernadine J. Dykes and Carla D. Jones described PPPs as “cooperative arrangements between governments and multinational corporations that are created to finance, construct and manage infrastructural projects.” The writers observed that in past decades “Africa’s involvement in PPPs has been limited relative to other continents,” but that lately, due to pressures on national budgets and the inability of the public sector to provide
efficient services, “African governments are looking harder for infrastructure development cash to support population growth and the demand for commodities.” Typically, PPPs consist of contractual arrangements referred to as BOTs, which stands for Build, Operate and Transfer. For example, a private company may provide financing for a road project and the government grants permission to such a company to operate the road for a specified period. This allows the company to recoup its investment, after which it transfers operations of the road to a government agency. The 45Km Dakar- Diamniadio Road in Senegal, which was completed in 2013, is a good example. The total cost of the project is estimated at $335 million (AfDB 2018).

According to the world bank, in 2016 Africa recorded 17 PPP infrastructure projects amounting to US$ 4.2 billion lower than the US$ 8.0 billion in 2015 for 27 projects. The Sub-Saharan Africa received 14 infrastructure deals totaling US$ 3.9 billion. This includes nine projects in the energy sector, two in the transport sector and three in ICT. Uganda was the most active country with four projects, followed by Ghana with three projects, and Senegal with two projects. Similarly, North Africa recorded 3 PPP projects amounting to US$ 246 million in 2016. Egypt got investment commitment towards two projects in the energy sector, with Djibouti getting investment for an ICT project in 2016. National Governments are traditionally among the most active participants in infrastructure financing. They can provide debt financing through state-owned banks and could also take equity stakes in projects and provide upfront capital grants. African National Governments committed a total of US$ 26.3 billion for infrastructure projects in 46 countries in 2016, compared with US$ 24 billion based on 44 countries in 2015. Maximum budgetary allocation for infrastructure projects were by the Republic of South Africa (US$ 3.6 billion), followed by Egypt (US$ 3.0 billion), Nigeria (US$ 2.7 billion) and Angola (US$ 2.6 billion) Governments, across the world and more so in Africa, are facing increasing budget pressures, making the involvement of multilateral development banks and private sector important for financing infrastructure projects. However, the public sector is expected to remain an important source of infrastructure financing in the context, especially in segments where private sector participation is likely to be limited. Limited budgetary resources have to be allocated for national as well as regional projects, with costs and benefits in case of latter more obscure than the former. Therefore, African economies need to undertake a thorough assessment of the allocation of fiscal resources whilst simultaneously improving their resource mobilization capacities.
Aid for Trade in Promoting Infrastructure: Africa remains one of the key recipients of Aid for Trade funds. A major share of disbursements under Africa's Aid for Trade has been made towards economic infrastructure and productive capacity. In 2015, global Aid for Trade disbursements stood at US$ 39.8 billion and disbursements to African countries reached a record high of US$ 14.1 billion. Given the large infrastructure needs of the continent and the cost-intensive nature of infrastructure projects, economic infrastructure sector dominates Africa’s Aid for Trade Projects. It accounted for 55 percent of total disbursements to Africa, followed by building productive capacities (42 %) and trade policy and regulation sectors (3 %). At sub-sectorial level, economic infrastructure funding is almost evenly divided between transport and storage (26 % of total) and energy (27 %).

Multilateral Development Banks (MDBs) & Bilateral Institutions are an important source of infrastructure financing, and also play a major role in mobilization of private sources of financing in countries where Public-Private Partnership in Infrastructure Financing In most cases, government budgetary resources are not sufficient to meet the infrastructure funding requirements of the country/region. Public-private partnerships (PPPs) are a mechanism for governments to procure and implement public infrastructure and/or services using the resources of the private sector without incurring any borrowings for project implementation, while also bringing in the expertise and efficiencies associated with the private sector. The implicit Government support in these projects provides lower risk perception. In the transport sector, PPPs can be an effective way to build and implement new infrastructure or to renovate, operate, maintain or manage existing transport infrastructure facilities. Today PPPs have emerged as an important mode of financing infrastructure projects in several developing countries. PPP financing may come from the public sector, private sources and/or multilateral development finance institutions banks and DFIs. Public source financing includes governments providing part of a project's upfront capital costs through grants or viability gap funding (government subsidies); state-owned enterprises (SOE) investing equity; and state-owned banks extending loans. Private source financing includes equity (including equity financed by corporate debt) through the project’s developer or project finance debt through private lenders, which can be either commercial banks or institutional financiers. Development Finance Institutions (DFIs) also provide various forms of support particularly for low-to-middle income countries. A PPP project involves financing from various sources, in some combination of equity...
and debt, and the ratios of these different contributions depend on negotiations between the lenders and the shareholders.

**Strategies for Increasing Transport Infrastructure**

Financing in Africa and India transport network is among the largest and densest in the world. To support its rapidly growing economy, the Government of India has implemented several mechanisms in terms of new funds, institutions, and agreements for upgrading its transport network. These mechanisms could be useful for transport infrastructure up-gradation in Africa's case, as both regions have similar features like a growing population, increasing economic growth, and huge land area, among others. Innovative Models of Infrastructure Development network including Toll-Operate-Transfer (TOT) could be used for the construction of roads in Africa. Under this model, the lessee gets to operate and maintain (O&M) roads that are already built and charge tolls from the public for a stipulated tenure. This would provide more funds for constructing new roads and highways, where the private sector is reluctant to invest. This model is especially useful to monetize publicly funded, commercially operational national highway projects.

Pension funds and Private Equity firms are allowed to lease government-owned roads and highways for a fixed number of years by making an upfront payment. The lessee, in turn, gets the right to collect toll, operate, manage and maintain the road and highway stretch. The road authority would provide a risk cover to the lessee against circumstances such as a rapid fall in toll collection and structural or engineering fault on the highways. India has recently used the TOT model under its asset recycling of public-funded infrastructure method. Another innovative model is setting up an Infrastructure Investment Trust (IIT), where road projects awarded under the engineering, procurement, construction (EPC) mode can be placed. This would work like the TOT model, by monetizing existing assets and releasing necessary capital to fund new roads. Countries like Malaysia, Singapore, and Hong Kong have successfully used such Infrastructure Investment Trust.

Transport infrastructure projects require large scale investment which may not be possible to be fully funded by African governments. This requires involvement by multilateral institutions, development agencies, and international donors. In this regard, co-financing is a well-established form of leveraging resources for reaching developmental outcomes. For promoting co-financing of infrastructure projects, several initiatives have already been taken by financial institutions in India and Africa. In the past, Export-Import Bank of India (Exim India) and the AfDB Group had signed an agreement for co-financing projects in Africa, which
envisaged joint financing of projects (priority being given to projects of small and medium enterprises) in regional member countries of the AfDB Group. Such financing arrangements should be encouraged especially in case of transport infrastructure projects. Some National Governments have set up such facilities in collaboration with multilateral financing institutions, for financing projects in Africa. For example, through the Accelerated Co-financing Facility for Africa, the Japan International Cooperation Agency provides co-financing support for AfDB’s sovereign projects. Bank of China has established the Africa Growing Together Fund a US$ 2 billion co-financing fund—, to finance eligible sovereign and non-sovereign guaranteed development projects in Africa. Implementing PPP in Africa can supplement the limited public sector capacities to meet the growing demand for infrastructure development. For the successful implementation of projects under PPP, India has a Model Concession Agreement (MCA), which addresses several crucial issues pertaining to a PPP framework like mitigation and unbundling of risks; allocation of risks and returns; symmetry of obligations between the principal parties; precision and predictability of costs and obligations; and reduction of transaction costs and termination. It also allocates risk to parties best suited to manage them this makes the investment climate more attractive. India has used the MCA agreement successfully in many transport sector projects for highway and port sectors. African governments could emulate these practices to enhance the viability of transport projects.

Conclusion and Recommendations
The following can be deduced from this paper and conclude as follows: Lack of bankable projects is a major constraint for infrastructure in Africa. According to an assessment conducted by the ICA, many of the project preparation facilities in the African continent have insufficient resources, and there is a large gap in terms of quantity, quality, and access to infrastructure. Further findings show that the magnitude of this gap depends on the country, sector, and dimension under analysis. For instance, the region exhibits a dismal performance in the length and quality of roads especially among low-income-countries (LICs) and lower-middle-income countries (LMCs). Second, narrowing the infrastructure gap has potentially large growth benefits and the growth benefits are the largest in the sectors with the greater gaps relative to global benchmarks.

South Africa and Nigeria may be Africa’s biggest economies, according to the International Monetary Fund, but thanks to public-private partnerships (PPPs), Morocco, Rwanda, Côte d’Ivoire, and a few other smaller countries can boast world-class infrastructure, Therefore, PPPs are lifelines for cash-strapped governments, meeting the infrastructure financing needs of the region is not trivial. It requires not only more efficient domestic resource mobilization from SSA governments but also innovative solutions to crowd in private financing (e.g. the Cascade approach).
Recommendations
Governments are encouraged to turn to PPPs to bridge the financing gap and deliver more efficient and cost-effective infrastructure. Construction of new roads and up-gradation of existing networks roads are necessary for the region. For this Africa could use PPP financing techniques and follow success stories of countries like Brazil, India, and China. African economies have started using several innovative methods to overcome insufficiency in transport infrastructure. Africa has started using drones for delivery services where road infrastructure is unavailable. For example, Zipline, a San Francisco start-up, has launched a for-profit drone delivery service for transporting crucial medical supplies to remote regions in Rwanda. This further stressed the need for using Automotive and Innovative means of solving the transportation gap of SSA in the forth digitalize industrial economy. Finally, strengthening the institutions governing public investment management systems and government procurement would increase the output multiplier of investment spending in infrastructure.

References
Bernadine J. Dykes and Carla D. Jones (2016) Public-private partnership in Africa challenge and opportunity for future management research
Foster and Briceño-Garmendia 2010, Africa infrastructure a time for transformation
Gwilliam et al. 2008 Infrastructure in Africa World Bank group