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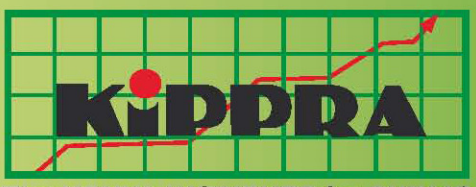

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Enhancing Road Infrastructure Development through Public Private Partnership in Kenya: A Comparative Analysis

Alex Oguso

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THE KENYA INSTITUTE FOR PUBLIC POLICY
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Enhancing Road Infrastructure Development through Public Private Partnership in Kenya: A Comparative Analysis

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Infrastructure and Economic Services Division

Kenya Institute for Public Policy
Research and Analysis

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This paper is produced under the KIPPRA Young Professionals (YPs) programme. The programme targets young scholars from the public and private sector, who undertake an intensive one-year course on public policy research and analysis, and during which they write a research paper on a selected public policy issue, with supervision from senior researchers at the Institute.

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Abstract

Infrastructure development offers the main platform for attainment of the development objectives envisioned in Kenya's Vision 2030. Bridging Kenya's infrastructure finance gap, which is estimated at US$ 2.1 billion (approximately Ksh 178.5 billion) annually by the 2013 Africa Infrastructure Country Diagnostic Report, is a major policy concern. In the roads sub-sector, only 6.95 per cent of the road network was reported to have been paved by 2013, yet road infrastructure accounts for over 80 per cent of total passenger traffic and 76 per cent of the freight within the country. In view of the limited state resources and need to control the public debt burden resulting from increased government borrowing to finance infrastructure development in the country, the government is currently focusing on bringing on board private sector investors to help bridge the road infrastructure gap. However, the roads sub-sector is yet to receive any meaningful boost from Public Private Partnership (PPP) initiatives in Kenya. This prompted this study to examine the private sector's assessment of the financial viability of PPP road infrastructure projects in the country and carry out a comparative study on selected countries that have successfully implemented the PPP scheme in financing road infrastructure development. The study results indicate that a complete PPP road infrastructure project of Thika Highway magnitude is financially unviable to the private party if they are left to solely finance the whole project. The study found that for a project of Thika Highway magnitude to be financially viable, then the private party would need financial support on at least 60 per cent of the capital cost of the project. This affirms the need for government financial support to improve the viability of PPP road infrastructure projects in the country. The study also identifies areas in the PPP framework, specific to the roads sub-sector, that need improvement. The study finally provides recommendations on measures that should be taken to improve on these areas in order to enhance road infrastructure development through Public Private Partnership initiatives in the country.

Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
ADB	Africa Development Bank
AICD	Africa Infrastructure Country Diagnostic
ANTT	Agência Nacional de Transportes Terrestres
BNDES	Brazilian National Development Bank
BOT	Build-Operate-Transfer
CBA	Cost-Benefit Analysis
CES	Consulting Engineering Services (Ltd)
EAC	East Africa Community
GTAC	Government Technical Advisory Centre
IEA	Institute of Economic Affairs
IDA	Investment Deduction Allowance
IFC	International Finance Corporation
IIFCL	India Infrastructure Finance Company Limited
IIPDF	India Infrastructure Project Development Fund
IPPs	Independent Power Producers
IRR	Internal Rate of Return
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KRA	Kenya Revenue Authority
KURA	Kenya Urban Roads Authority
MCAs	Model Concession Agreements
MoTI	Ministry of Transport and Infrastructure
MRG	Minimum Revenue Guarantee
NHAI	National Highways Authority of India
NHDP	National Highways Development Projects
NPV	Net Present Value
O&M	Operations and Maintenance
OMT	Operate-Maintain-Transfer
PPI	Private Participation in Infrastructure
PPP	Public Private Partnerships
PSP	Private Sector Participation
PwC	PricewaterhouseCoopers
RFP	Request for Proposals
RFQ	Request for Qualification
RSIP	Road Sector Investment Programme
RVR	Rift Valley Railways
TRC	Toll Revenue Cap
VGF	Viability Gap Fund

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1. Introduction

1.1 Background

Infrastructure plays a major role in accelerating economic growth by enhancing a country's productive capacity, reducing the cost of doing business, attracting foreign investment and enhancing competitiveness in trade. This informs the need for developing countries to invest more in infrastructure development to create a good platform for their economic growth and development. According to the Africa Infrastructure Country Diagnostic (AICD) Report 2013, Africa's infrastructure needs stand at about US$ 93 billion annually, while African countries only spend about US$ 45 billion on infrastructure annually (Sy, 2013). This means that the infrastructure financing gap is about US$ 48 billion. Recognizing the key role that infrastructure plays in spurring economic growth, African countries need to mobilize more financial resources to finance this infrastructure gap. For Kenya, the 2013 AICD report estimates the infrastructure gap to be US$ 2.1 billion (approximately Ksh 178.5 billion) annually. This gap is likely to be wider considering the infrastructure development needs enlisted in Kenya's Vision 2030 economic blueprint, which need an annual budget of Ksh 340 billion, according to Kenya's National Treasury. The country's projected infrastructure financing gap for the period 2012-2020 is presented in Table 1.1

Table 1.1: Projected infrastructure financing gap for Kenya (2012 - 2020)

Sub-Sector	Costs (US$ billions)
Energy	19.8
Roads	9.0
ICT	7.8
Railways	7.2
Ports	4.8
Water and Sanitation	4.6
Lamu Transport Corridor	3.7
Housing	2.9
Airports	0.9
Total Infrastructure Financing Needs	**60.7**
Expected Financing available to GoK (2012-2020)	25.0
Infrastructure Financing Gap	**35.7**

Source: Vision 2030 Secretariat

Table 1.1 indicates that Kenya's infrastructure finance needs for the period 2012-2020 stands at US$ 60.7 billion while the expected financing from the

government over the same period is US$ 25.0 billion. This leaves the government with an infrastructure financing gap of US$ 35.7 billion, which needs to be filled from other financing sources. The roads sub-sector, which is the focus of this study, takes 15 per cent share of the projected infrastructure financing needs in the country. The Road Sector Investment Programme (RSIP) for the period 2010-2014 estimated the backlog in maintenance of the already paved road network for the five year period to be Ksh 230 billion. Out of this, approximately Ksh 27 billion was deferred to the period after the year 2014 (the current period) due to inadequate finance. In view of the limited state resources and the pressing need to bridge the infrastructure financing gap in the country, the government is currently focusing on more involvement of the private sector in financing, designing, constructing and operating the infrastructural facilities in the country. Traditionally, the government has been borrowing both from domestic and foreign sources to finance part of the infrastructure gap in the country. However, in view of the high public debt, which hit Ksh 2,217.3 billion in 2014, the government is keen on bringing on board private investors through Public Private Partnerships (PPPs) to help bridge the infrastructure financing gap. Engaging the private sector through the PPP scheme would enable the public sector to access the private entities' substantial financial resources and technical expertise. It also enables the government to transfer some of the project-related risks to the private sector and improve efficiency of service delivery.

Kenya's Public Private Partnerships Act enacted in 2013 defines PPP as:

> *an arrangement between a contracting authority and a private party under which a private party undertakes to perform a public function or provide a service on behalf of the contracting authority; receives a benefit for performing a public function by way of: compensation from a public fund; charges or fees collected by the private party from users or consumers of a service provided to them; or a combination of such compensation and such charges or fees; and is generally liable for risks arising from the performance of the function in accordance with the terms of the project agreement.*

The private sector in this context refers to all investors, contractors, operators, financial institutions and other enterprises run by private individuals or groups and not controlled by the government. These include both local and international enterprises that have technical capability, financial capacity and legal capacity to enter into an infrastructure development or maintenance project agreement with any state contracting authority under the PPP Act 2013.

This study focuses on road infrastructure development, since road transport is the dominant form of surface transport in Kenya, hence the road network is a key infrastructural facility in the country, yet it has received minimal private sector

investment over the years. Road transport accounts for over 80 per cent of the country's total passenger traffic and 76 per cent of the freight within the country. Yet, only 7 per cent of the 160,886 km road network is paved, which amounts to a total length of 2.19 km paved roads per 10,000 inhabitants in Kenya. This is less than the East Africa Community (EAC) member states' average of 2.53 km (ADB, 2014). Additionally, the road infrastructure facilities are unique in the sense that in most cases, they are not self sustaining and are generally considered pure public goods.

1.2 Overview of PPP Initiatives for Road Infrastructure Developments in Kenya

The PPP scheme is not new to Kenya. There have been a number of PPP projects in infrastructure development in the country. According to the PPP unit at Kenya's National Treasury, there have been about eight (8) PPP projects in the energy sub-sector done through the Independent Power Producers initiatives (IPPs), which were introduced in 1996. Currently, there are seven (7) on-going projects in the energy sub-sector under IPPs initiative. The PPP unit indicates that the other sub-sectors such as Airports, Seaports, and Water and Sewerage have had one PPP project each, while the railways sub-sector has one on-going PPP project (the Rift Valley Railways - RVR concession signed in 2006). In the road sub-sector, the PPP unit indicates that there has been only one successful PPP project; that is, the Mtwapa - Nyali Bridges Concession, which was signed in 1959. The other road PPP project that was to be undertaken under the BOT (Toll)[1] model, was the Nairobi Urban Toll Road where the Government of Kenya got into an agreement with Strabag Group in 2007 to design, finance, construct and operate a 106 Km section of the Nairobi urban road for a period of 30 years. However, the project was cancelled by the government in April 2011 following the withdrawal of interest by the World Bank to finance the PPP project.

In an effort to improve the framework for private sector participation in infrastructure development, the Government of Kenya enacted the PPP Act of 2013. The Act regulates the process of engagement between the private and public parties, provides a foundation for establishment of institutions to ensure the delivery of the PPP agenda, and the range of support from the government of Kenya for the PPP projects. Following the efforts in strengthening the legal, regulatory and institutional framework for engagement of the private sector in infrastructure development, the government has so far approved a list of 69 projects for implementation under PPP scheme. In the road sub-sector, the PPP

1 BOT (Toll) model is a Build-Operate-Transfer model of delivering PPP road projects where the private entity designs, finances, builds and operates the road for a specified period of time (concession period) during which it is expected to recoup its investment and earn some returns on investment through road toll collections, before transferring back the road facility to the government.

projects in the pipeline are as presented in Table 1.2.

Table 1.2: PPP projects in the pipeline for road infrastructure development in Kenya

PPP projects in the pipeline	Project status
Development of 2nd Nyali Bridge connecting Mombasa Island with the North mainland	Transaction Advisor selected to carry out feasibility study
Operations and maintenance of 28.6 km Nairobi Southern Bypass – currently under construction by China Road and Bridge Corporation (K)	Transaction Advisor selected to carry out feasibility study
Operations and Maintenance of Thika Highway	Transaction Advisor selected to carry out feasibility study
Dualling of Nairobi-Nakuru Road, which forms part of the Trans-African Highway (Northern Corridor). Development and operation of the 157 km Nairobi-Nakuru Road	Transaction Advisor selected to carry out feasibility study
Dualling of Mombasa-Nairobi Highway: Upgrading, capacity expansion and operation and maintenance of the highway	Transaction Advisor selected to carry out Feasibility Study

Source: Public Private Partnership (PPP) Unit Website, National Treasury, Kenya (extracted in June 2015)

Table 1.2 indicates that the road sub-sector has five (5) PPP projects in the pipeline. The PPP unit indicates that transaction advisors[2] have been selected to undertake feasibility studies on these projects. Additionally, the government has adopted an ambitious plan to develop and rehabilitate 10,000 km of the roads network within the next five (5) years. In the first phase of the programme, the PPP unit confirmed that the evaluation of the submitted Request for Proposals (RFP) for the development of 3,000 km of road network in various parts of the country through the BOT (Annuity)[3] model is currently in progress. In view of the current status of these PPP projects in the road sub-sector, it is necessary to review the private entities' assessment of the commercial viability of road PPP projects in Kenya, in order to highlight the considerations made by the private sector before investing in such road projects. It is also necessary to draw lessons from the successful implementation of the PPP scheme on road infrastructure development in other countries. The results of the study provide significant inputs in the successful undertaking of the PPP road projects in Kenya.

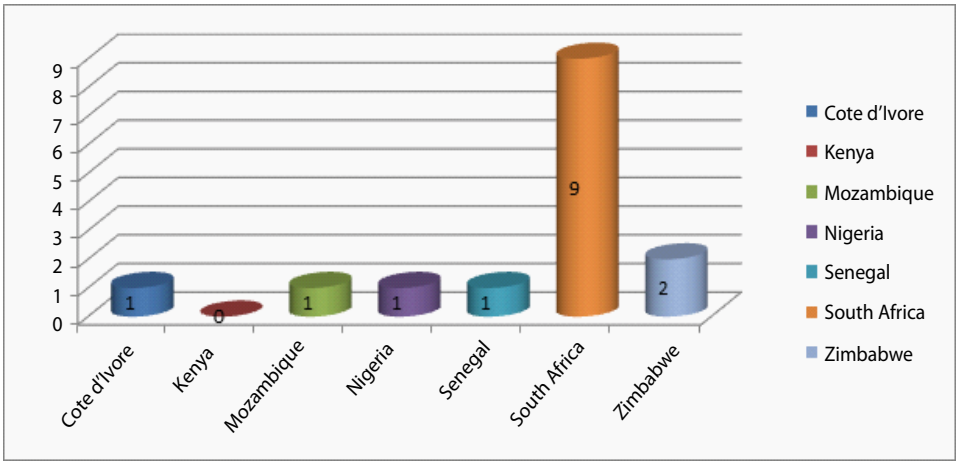
2 According to the PPP Act 2013, transaction advisor refers to a person appointed in writing by a contracting authority who has the appropriate skill and experience to assist and advise the contracting authority on PPP engagement.

3 In BOT (Annuity) model, the private entity designs, finances, builds and/or maintains the road for a specified period of time and recovers its investment and a predetermined return on investment from the agreed annuities paid by government after the start of commercial operation of the road facility.

1.3 Selected Countries for the Study

Many countries across the world have used private sector participation in road infrastructure development. This is evidenced by the Private Participation in Infrastructure (PPI) Project database, which provides data for various infrastructure projects undertaken in 139 low- and middle-income countries in the developing world. The database covers PPP projects in energy, telecommunications, transport, water and sewerage sectors that reach financial closure and where the private entities have at least 15 per cent ownership. The low- and middle-income countries are categorized into Sub-Saharan Africa, Middle East and North Africa, Europe and Central Asia, Latin America and the Caribbean, East Asia and Pacific, and East Asia regions. In the Sub-Saharan Africa region, six (6) countries are reported to have had private sector participation in road infrastructure development in the period 1990-2013. South Africa has the highest number of PPP road projects followed by Zimbabwe, which has two PPP road projects. Kenya has no PPP road project reported during the period. The number of PPP road projects in the Sub-Saharan countries is presented in figure 1.1.

Figure 1.1: PPP road projects in Sub-Saharan Africa region (1990-2013)

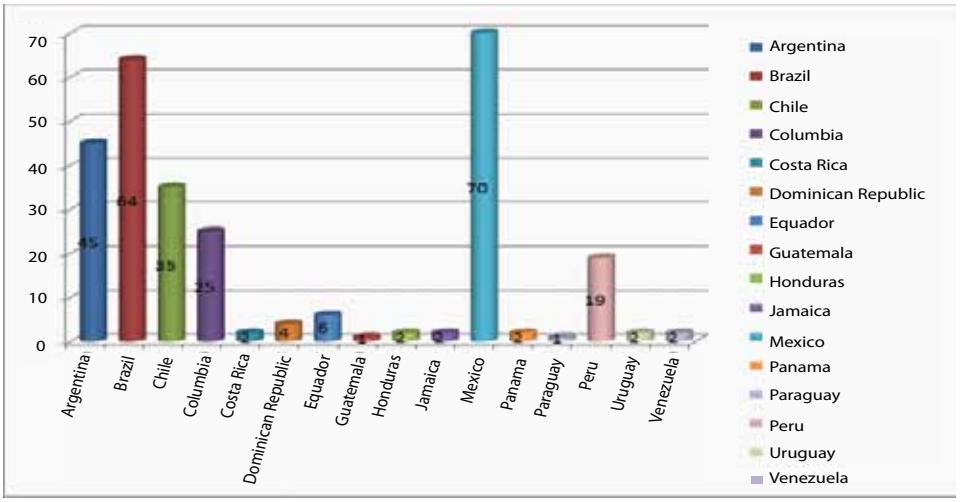


Source: Author's analysis of PPI Project Data, World Bank (2015a) (extracted in February 2015)

The Latin America and the Caribbean region have the highest number of countries that have had PPP road infrastructure development projects across the world. The region has 16 countries that have undertaken PPP road projects, with Brazil and Mexico having 64 and 70 PPP road projects, respectively, as presented in Figure 1.2. Though Mexico has the highest number of PPP road projects, Brazil has the highest total private sector investment on PPP road infrastructure development,

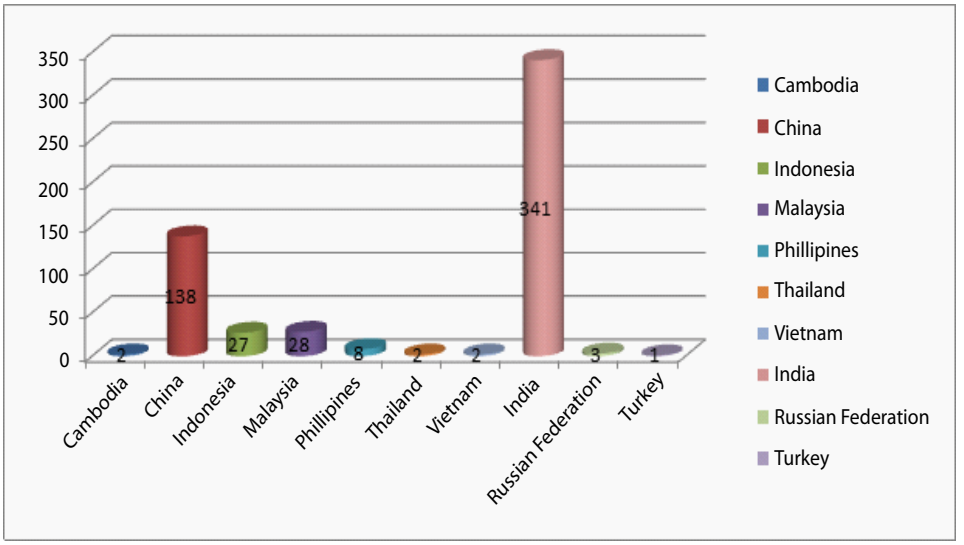
which amounts to US$ 33,255 million compared to Mexico's US$ 24,658 as reported by World Bank and PPIAF. Therefore, in this study, Brazil is considered ahead of Mexico in selecting the comparator countries.

Figure 1.2: PPP road projects in Latin America and the Caribbean region (1990-2013)



Source: Author's analysis of PPI Project Data, World Bank (2015a) (extracted in February 2015)

Figure 1.3: PPP road projects in Europe, Asia and Pacific regions (1990-2013)



Source: Author's analysis of PPI Project Data, World Bank (2015a) (extracted in February 2015)

From the PPI project database, the other low- and middle-income countries that have had PPP road projects during the period 1990-2013 include Cambodia, China, Indonesia, Malaysia, Philippines, Thailand, Vietnam, India, Russian Federation and Turkey. Among these countries, India has had the highest number of PPP road projects followed by China, as presented in Figure 1.3. Therefore, India is considered for the study among these countries.

From the analysis of the PPI projects database, this study makes use of South Africa, Brazil and India as comparator countries in an attempt to draw lessons for successful implementation of the PPP scheme on road infrastructure development in Kenya. Additionally, this study makes use of data from Nairobi-Thika Highway development and maintenance project to examine private entity's assessment of financial viability of PPP road infrastructure development projects in the country.

1.4 Problem Statement

Kenya recognizes the need to invest more on infrastructure development to create an enabling platform for realization of the development goals set in Vision 2030 blueprint. In view of the limited state resources and the need to reduce government borrowing, which has seen the public debt rise to Ksh 2,217.3 billion in 2014, the Government of Kenya is currently focusing on tapping in the private sector's immense financial resources to help bridge the infrastructure finance gap. To achieve this, the government has developed legal and regulatory frameworks for private sector participation in infrastructure financing through PPP scheme. Despite these efforts, the country is still faced by an infrastructure finance gap estimated at US$ 2.1 billion annually by the Africa Infrastructure Country Diagnostic Report (Sy, 2013). More specifically, the road network, which accounts for over 80 per cent of total passenger traffic and 76 per cent of the freight within the country, has only 6.95 per cent of it paved and is yet to receive any significant boost from the PPP initiatives. If the PPP road infrastructure development initiatives do not become a success, then the government may be forced to increase its borrowing to finance the road infrastructure gap, which would consequently lead to high and unsustainable public debt burden. Therefore, it is critical to examine the private sector's assessment of the financial viability of PPP road projects in the country to inform policy on how to increase private sector's participation in the PPP road infrastructure projects. To complement this, it is necessary to undertake a comparative study on countries that have successfully implemented the PPP scheme in financing road infrastructure development, in order to draw lessons on how best to implement the PPP scheme in roads development and maintenance in Kenya.

1.5 Research Questions

This study seeks to address the following research questions:

1. What is the likely outcome of private parties' assessment of the financial viability of PPP road infrastructure development projects in Kenya?
2. What lessons can be drawn from the successful implementation of the PPP scheme in financing road infrastructure development in South Africa, Brazil and India?

1.6 Research Objectives

The general objective of the study is to examine ways of enhancing road infrastructure development in Kenya through Public Private Partnership initiatives.

The specific objectives are:

1. To examine private parties' assessment of financial viability of PPP road infrastructure development projects in Kenya (using Thika Highway development project data).
2. To review the successful implementation of the PPP scheme in financing road infrastructure development in South Africa, Brazil and India in order to draw lessons for implementation of the PPP scheme on road infrastructure development in Kenya.

1.7 Justification and Policy Relevance

Financing the infrastructure gap in Kenya is a major policy concern, since infrastructure offers the main platform for attainment of the development objectives envisioned in Kenya's Vision 2030. In view of the limited state resources, the private sector resources have turned out to be a major alternative source of finance that can be used to bridge the infrastructure gap. To reap the benefits of private sector investment in road infrastructure development, this study makes an attempt to generate more insights on the key parameters that influence the financial viability of PPP road infrastructure projects in the country from the private sector's point of view. The study also highlights the best practices for betterment of implementation of the PPP road infrastructure development projects in Kenya.

2. Literature Review

This section presents the theoretical and empirical literature on private sector participation in enhancing development of road infrastructure projects.

2.1 Theoretical Literature

2.1.1 Theories for PPP scheme adoption

The theories that have been used to explain the adoption of the PPP scheme in various countries include theory of x-efficiency, principal-agent theory, and Transaction cost theory. The theoretical underpinning of the concept of the public-private partnership is linked to the theory of x-efficiency developed by Leibenstein (1966). The theory argues that inefficiencies in public institutions result from distortionary government interventions and highly bureaucratic state organizational structures. Therefore, the theory indicates that the PPP arrangement helps to reduce the sources of x-efficiencies in the public sector, hence enable the public sector to make use of the private sector's effective managerial skills, efficiencies in service delivery, and cost minimization (Hammami et al., 2006).

The principal–agent theory stipulates that the government, as the principal, selects the best agent (private party) to contract and then monitors the behaviour of the contracted agents to ensure that they provide the agreed public services. In the principal-agent theory, information asymmetry leads to the problems of adverse selection and moral hazard. In the PPP arrangements, the private party is assumed to be more informed than the public contracting authority in terms of how best to provide the agreed public services. The public contracting authority, therefore, has to look into ways of influencing the private party to act in accordance with it as the principal. This theory is concerned mostly with risk allocation problem in the PPP scheme (Arnold and Kehl, 2010).

The other theory for adoption of PPP scheme presented by Arnold and Kehl (2010) is the transaction cost theory, which postulates that the main objective of the PPP scheme should be to adopt an arrangement in which the overall transaction costs are minimal. They explain that the PPP arrangement can be costly in view of the costs involved, such as negotiation costs, structuring costs, monitoring costs, bonding costs and residual loss costs of the principal-agent problem. On the other hand, public provisions might also be costly due to managerial inefficiencies as evidenced by the fact that most of the large government infrastructure projects are always way over the budget. It is argued that PPP scheme can lower public good production costs in view of competitive pressures that tend to eliminate inefficiencies.

2.1.2 Theory for project viability analysis

The main theory for project viability analysis is the Cost-Benefit Analysis (CBA) theory, which entails the examination of the level of social, economic and financial welfare associated with any of the possible courses of action (Dreze and Stern, 1987). Tánczos and Konga (2001) note that in most investment projects, a socio-economic and a financial analysis is carried out and used by the various stakeholders to make objective decisions on the viability of a project. The evaluations, usually done using CBA, consider market effects as well as the non-market effects of decisions and bring these to a monetary value. Tánczos and Konga (2001) also indicate that the frameworks used widely for CBA include Cost Effective Analysis, Multi-Criterion Analysis, Risk Benefit Analysis, socio-economic analysis and financial analysis. The frameworks relevant to this study are socio-economic analysis and financial analysis. Socio-economic analysis takes care of the direct and indirect costs and benefits of a particular project, while the financial analysis takes into account the actual costs and monetary revenues only.

2.1.3 Theory for comparative research

The theory of comparative research entails making comparisons across different subjects or units of analysis with a view to bringing out the existing similarities and differences. Enli (undated) indicates that comparative studies involve systematic selection of cases (not random, but information-oriented). Additionally, Enli (2010) notes that comparative research strategies consist of "most similar system design", which is done by choosing subjects that are similar in as many variables as possible and "most different system design", which entails maximizing on variables on which the subjects under study differs as you investigate the phenomenon under study.

2.2 Empirical Literature

The PPP scheme has been used widely across the world in financing road infrastructure development from the late 1990s to date. Various empirical studies have been carried out over this period in an attempt to identify the critical success factors for PPP road projects and the measures that can be put in place to enhance road infrastructure development through public private partnership in various countries. Bagui and Ghosh (2013) note that the PPP arrangement is a trilateral negotiation game between the private entity, the lending institution, and the government in which the private sector investor has to make several considerations since in his/her perspective, the critical success factor is the profit

margin from the projects. Therefore, careful financial planning and assessment has to be carried out before engaging in the PPP road development projects. They added that financial assessment of the project is important and the methods generally used is Cost Benefit Analysis with the decision analysis on the viability of the BOT project being based on Net Present Value (NPV), Internal Rate of Return (IRR) and payback period. Using CBA technique, Jakutyte (2012) did a comparison of the conventional procurement approach and PPP approach on Lithuanian infrastructure projects. The sensitivity analysis results showed that the PPP delivers higher benefits in case of high discount rates, whereas the traditional procurement approach prevails over PPP when low discount rates are in use. According to Katz (2006), the decision whether to proceed with PPP arrangement or to go for conventional procurement process depends on whether it is easy to specify outcomes in a way that performance can be measured objectively and rewards or sanctions applied, among other factors. Once the private party is involved in the PPP road project, Kwak et al (2009) recommend that the private sector should share its knowledge and expertise with the government in creating PPP-related policies and a favourable investment environment, get the financial institution willing to finance the PPP project involved early in the bid preparation process, and maintain long-term relationships with potential industry partners to enhance creation of consortiums. These efforts tend to enhance the implementation of the PPP scheme on road infrastructure development.

Researchers have also attempted to clarify the roles of the government in facilitating PPP projects, and found that the main government roles include creating a favourable investment environment, establishing adequate legal/regulatory frameworks, establishing a coordinating and supportive authority, selecting a suitable concessionaire, and being actively involved throughout the project life-cycle phases (Kwak et al, 2009). Specifically, according to Kumaraswamy and Zhang (2001), the issues that governments need to deal with for the PPP scheme to work smoothly include: establishing adequate legal and regulatory framework, providing stable political environment, developing the domestic capital market, ensuring a fair and competitive bidding, providing adequate government assistance and guarantees, conducting project feasibility study, selecting the most suitable concessionaire, and continuous assessment of project progress and performance.

In cases where the PPP road projects are socio-economically viable but not financially viable to the private sector, the government should provide some support to make the projects viable to the private sector investors. The kind of support that can be provided by the government to improve on the financial viability of the PPP road projects are minimum revenue guarantee; flexibility in tariff structure; financial support such as grants, tax incentives, free use of project sites and

facilities by the private party; protection from force majeure; foreign exchange rate protection and early completion bonuses; standardized PPP procurement process and contract documentation to reduce on tendering costs; and capacity building for government staff and enhancing two-way communication channels with the private sector (Kwak et al.,2009).

A study by Zhang (2005) identifies economic viability, appropriate risk allocation through reliable contractual arrangements, sound financial package, reliable concessionaire consortium with strong technical strength, and favourable investment environment as some of the critical success factors for PPP in road infrastructure development. A report by Aggarwal (2013) on Delhi-Gurgaon Toll Road in India indicates that including the construction period for a road project as part of the concession period enhances the chances of the private entity completing the construction within the shortest time possible. The report also highlights the need for public support in land acquisition through dialogue, need to amalgamate or reduce the number of government agencies issuing clearances to the private party, need to rely on updated traffic forecasts and need for efficient contract management especially on toll collection sharing as ways of ensuring successful implementation of the PPP scheme on road infrastructure development.

In Kenya, a study by Diba (2012) acknowledges that public acceptance of the PPP road projects would also determine its success, since the public could object the introduction of road tolls, which are meant to generate revenue in the PPP scheme. The study by Diba (2012) also found that project implementability was ranked highly as the key success factor for PPPs in road infrastructure, and that effective legal and regulatory framework is necessary to guide and manage the implementation of the PPPs in road infrastructure projects.

Pessoa (2006) opines that the challenges facing PPP in infrastructural development could result from lack of appropriate regulatory framework, undeveloped capital markets or from non-competitive industries that are dependent on investments made by a few large companies. Hammami et al (2006) note that macroeconomic stability, institutional quality (less corruption and effective rule of law), previous PPP experiences, and corresponding allocation of risks are essential for successful PPP engagements. Their study shows that policy makers need to ensure overall price stability in order to guard PPPs against exchange rate risks, inflation risks, among others. Hammami et al (2006) are also of the opinion that political risks (ethnically fractionalized societies, political biases, and the lack of checks and balances from the legislature) discourage the formation of PPPs. The study results stress the critical contribution of controlling corruption and the rule of law in attracting both private investors and efficient infrastructure-services providers. The results for Hammami et al (2006) are in line with those of Kappeler and

Välilä (2010), and Kripa (2013) who identify factors with impact on PPP projects as government's resource constraint, stable macroeconomic condition, large market or its potential to grow, political environment and a country's regulatory environment. For the case of Kenya, Diba (2012) highlights critical success factors for PPPs in road sub-sector as ability to implement the project, effective procurement process, government commitment, favourable economic conditions and available financial market. Diba (2012) notes that government commitment in form of political goodwill and guarantees in form of minimum revenue guarantee, risk sharing guarantees, and minimum traffic guarantees are also important in attracting private sector investment in road infrastructure development in Kenya.

PPP road projects are subject to various risks in view of their large investment costs (which are also highly irreversible), complexity, and long-term contracts extending to a period of about 30 years. Therefore, a proper risk allocation framework is very important in ensuring the success of PPP road infrastructure development projects. Several studies have been carried out to identify the risks involved in the PPP road projects and review the appropriate risk allocation framework between the public contracting authority and the private parties. Basılio (2011) affirms that infrastructure projects face particular challenges and risks, which include existence of natural monopolies that exclude competition, the assets nature (which are capital-intensive, immobile and not easily redeployed for other uses), outputs usually non-tradable, existence of pricing problems related to political sensitiveness of the services to be provided, and the long-term tenor that increase the uncertainty surrounding the projects. Vrooman (2012) identifies the risks encountered in PPP infrastructure projects as demand risk, statutory process risk, payment risk, maintenance cost risks based on changing demand, financial risk, legal risk, liability risk, construction risk, design risk, inflation risk, partner risk, schedule risk, economic policy risk, environmental risk, public acceptance risk and sustainability risk. Other risks identified by Renato et al (2010) are openness of economy, fiscal capacity of government, level of technical efficiency and capacity of the private firms, regulation, and credit risk of buyers. The report by Aggarwal (2013) on Delhi-Gurgaon Toll Road in India indicates the risks involved in the projects as delays in land acquisition due to court cases, removal of trees, shifting of religious structures and other utilities, and changes in scope of work, which lead to cost overruns.

Ashuri et al (2010) point out that inappropriate risk sharing mechanisms between the government and the private party has contributed to the failure of many Build –Operate- Transfer (BOT) projects. They noted that in BOT models, the traffic revenue risk due to uncertainty about the future traffic levels is a big risk to the private sector investors. However, they also noted that parties involved in the BOT road project can mitigate this risk through revenue risk sharing mechanisms, such

as Minimum Revenue Guarantee (MRG) and Toll Revenue Cap (TRC). Ncube (2010) affirms that to enhance the PPP project arrangements, the risk allocation framework should appropriately specify each partner's contractual roles, risks and rewards to provide incentives for delivery of the desired public goods and services. Diba (2012) also noted that appropriate risk sharing is important for success of road infrastructure PPP projects in Kenya.

2.3 Overview of Literature

The reviewed literature highlights the factors that have influenced the successful implementation of the PPP scheme in delivering infrastructure development projects in various countries. The literature also points out the risk factors that are considered a threat to the success of any PPP infrastructure development project. However, the empirical literature specific to PPP road infrastructure projects is limited. In Kenya, only one study from the literature reviewed focuses on PPP road infrastructure projects. This study focused generally on critical success factors on road infrastructure PPP scheme, hence does not specifically analyze the legal and institutional frameworks and other measures put in place to enhance road infrastructure development in Kenya through PPPs. Additionally, most of the studies do not present the private sector's perspective of the assessment and viability of PPP infrastructure projects. They give a general approach, which in most cases only highlights the public socio-economic analysis of PPP road infrastructure projects. This study, therefore, sought to fill these information gaps by examining the private sector's assessment of a PPP road infrastructure development project in Kenya and carrying out a comparative study on the PPP scheme for financing road infrastructure development in selected countries.

3. Methodology

This section presents the theoretical and conceptual framework for this study. It also gives the analytical framework and the sources of data for the study.

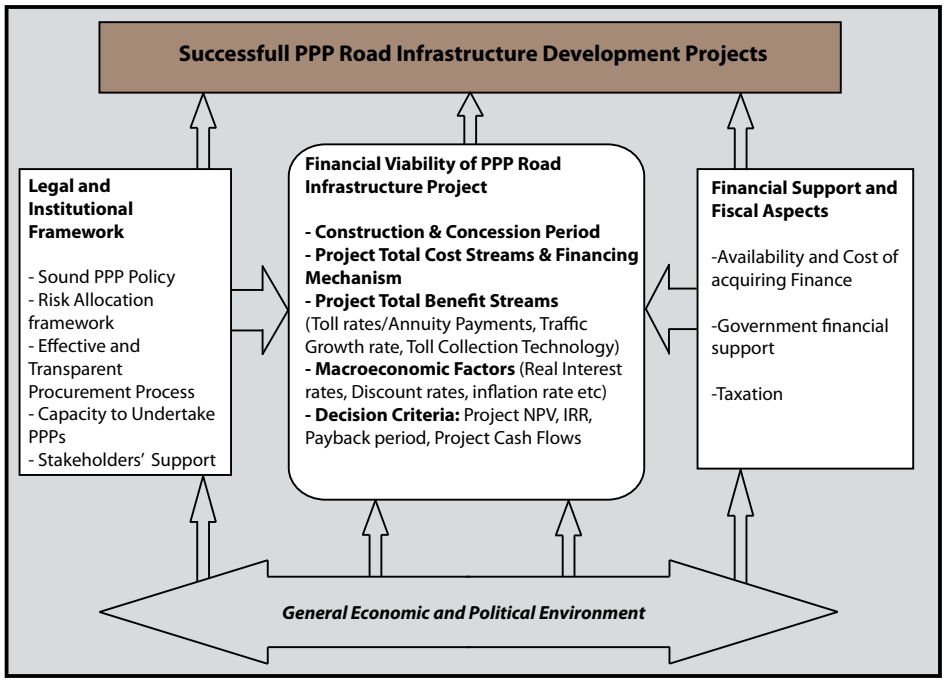
3.1 Theoretical Framework

In evaluating the private sector's assessment of a PPP road infrastructure development project, the study makes use of the financial Cost-Benefit Analysis (CBA) theoretical framework. In view of the limited data on a complete typical PPP road infrastructure development project in the country, the study carries out a scenario analysis using Thika Highway development project data. This study also uses a comparative research approach to draw lessons from the successful implementation of the PPP scheme in road infrastructure development in South Africa, Brazil and India. The comparative analysis aims at discovering the similarities and differences in the PPP scheme for road infrastructure development in the selected countries.

3.2 Conceptual Framework

The study is modelled on the premise that enhanced development of road infrastructure through the PPP scheme depends on some critical factors, identified in the literature, which the private entities take into consideration during their decision making analysis. These factors provide appropriate investment environment and are important in determining the viability of PPP road infrastructure development projects. Generally, these factors can be categorized into legal and institutional factors, financial support and fiscal regime, and general economic and political factors. The general economic and political environment provides the overall environment that impacts on all the factors under consideration and also the success of PPP road infrastructure development projects. The overall relationship between these factors is as presented in the conceptual framework in Figure 3.1.

Figure 3.1: Conceptual framework



Source: Author's depiction of the PPP environment

3.3 Analytical Framework

To address the first objective, the study examines the private party's decision making analysis on a PPP road infrastructure development project using financial Cost-Benefit Analysis (CBA). The analysis makes use of information and data from Nairobi-Thika Highway development project. This project was chosen in view of the availability of data required for such an analysis, and the fact that the Operations and Maintenance (O&M) of the highway is to be done through the PPP scheme. Therefore, the envisaged maintenance concession qualifies it as a PPP road infrastructure development project in the country. The financial CBA used in the study entails identification of costs and benefits that accrue to the private party. The study makes use of Net Present Value (NPV) evaluation technique and Financial Internal Rate of Return (FIRR)

The Net Present Value (NPV) is specified as follows (Loto and Nkaogu, 2013; Bagui and Ghosh, 2013):

$$NPV = \sum^{n}_{(t=o)} ((B_t - C_t)/(1+i)^t) - K_o \quad \ldots\ldots (1)$$

Where: K_o = the initial costs (cost of preparation/signing of contract, feasibility costs among others)

B_t = Stream of benefits

C_t = Stream of costs

i = Discount rate

t = Time in years

The study also carries out sensitivity analysis[1] by varying some of the independent variables to ensure a more objective analysis.

To address the second objective, the study carries out a comparative study of the implementation of the PPP scheme in financing road infrastructure development in Kenya, South Africa, Brazil and India. The study looks at both the similarities and the differences in the PPP schemes in these countries, and compares with the Kenyan situation. Consequently, the study draws lessons from the successful implementation of the PPP scheme in financing road infrastructure development in these countries.

3.4 Definition and Measurement of Variables

Dependent Variables

Payback Period: This is used to capture how long it takes for cumulative discounted benefits to become equal to cumulative discounted costs. It is expected that the shorter the payback period, the more attractive the PPP road project would be to the private party.

Net Present Value (NPV): This refers to the value of the PPP road infrastructure project to private party over the entire period of analysis. NPV is obtained from the difference between the net present benefits (NPB) and the net present costs (NPC). The decision rule is that if the NPV is greater than zero, then the PPP road infrastructure development project is viable to the private investor; that is, the higher the NPV, the higher the profitability of the PPP road project.

Internal Rate of Return (IRR): This is given by the discount rate at which the NPV of the stream of benefits is exactly equal to the NPV of the stream of costs. If the IRR is higher than the rate of return on alternative investments, then the PPP road infrastructure project is a good investment.

4 Sensitivity analysis is a systematic method for examining how the outcome of CBA changes with variations in inputs, assumptions, or the manner in which the analysis is set up.

Independent variables

Independent Variables	Measurement	Literature Source
Costs of the Project	Include cost of preparation and signing of contract, feasibility preparation costs, interest rate on capital borrowing, road design costs, land acquisition and compensation costs, construction costs, operations and maintenance costs, among other costs	(Loto and Nkaogu, 2013; Bagui and Ghosh, 2013)
Benefits from the project	Measured by the revenue streams, which include road toll charges and other possible commercial benefits generated through the right of way (if the right of way is granted to the private entity) or the Annuity payments by the government	(Loto & Nkaogu, 2013; Bagui & Ghosh, 2013).
Discount Rate	The discount rate is used to evaluate the present value of future stream of costs and benefits. The study makes use of private discount rate, which is considered as the rate a private firm would use to borrow for a project. A discount rate of 12.0%, which is the opportunity cost of capital in Kenya is used in the study	CES and APEC (2012)
Concession Period	The period during which the commercial operation of the PPP road infrastructure development contract is active. Maximum concession period is 30 years as per the PPP Act of 2013. For the O&M of Thika Highway, the proposed concession period is 20 years	PPP Act of 2013; CES and APEC (2012)
Interest rates	14% (Interest rate of debt in Kenya varies from 14% to 22% depending on the project and associated risk. The analysis uses the interest rate considered by the consultants for the PSP report, which is 14%)	CES and APEC (2012)
Taxation	16% Value Added Tax (not included in the analysis), Corporate Tax on income at 30% for residents and 37% for non-resident concessionaires, Concession Fees (not included in the analysis)	KRA online publications
Annual Inflation rates	Future costs streams are inflated by an annual inflation rate of 6% over the concession period	CES and APEC (2012)
Toll rates	Determined by the willingness to pay surveys done by consultants on behalf of Government of Kenya. Toll charges to be collected from the two toll plazas proposed by the consultant; one next to Safari Park Hotel and another at Juja. Annual toll indexing is at 5%	CES and APEC (2012)
Projections on future traffic volumes	Determined by the traffic surveys done by consultants on behalf of Government of Kenya. The traffic figure of 2012 was taken as the base traffic and projections were done for future streams of traffic. The traffic volumes are presented in terms of Annual Average Daily Traffic (AADT), which is the total volume of vehicle traffic of a particular road for a year divided by 365 days	CES and APEC (2012)
Financing Sources/ Composition	Financing is assumed to be from owner's equity and debt only; debt interest rate is assumed to be at 14%, with annual repayments for a repayment period of 10 years	CES and APEC (2012)

3.5 Data Sources

The study makes use of reports and data on the Nairobi-Thika highway development and maintenance project to address the first objective. The main sources of the data include the CES and APEC (2012) Feasibility Report for Private Sector Participation Study in Operation and Maintenance of Nairobi-Thika Highway, information from KeNHA on the ongoing maintenance works on the highway, Africa Development Bank reports, and online publications on the development carried out on the highway. The study also carries out a comparative study on implementation of PPP schemes in financing road infrastructure development in Kenya, South Africa, Brazil and India through review of literature from various sources on PPP schemes and PPP road infrastructure development projects in the various countries. Specifically, the study focuses on the countries' PPP Unit publications, PPP laws and regulations, and various publications on PPP road infrastructure development projects in the selected countries.

4. Results and Discussions

This section presents the results for the financial CBA done using Thika Highway development project data and comparative analysis of the PPP scheme in Kenya, South Africa, Brazil and India.

4.1 Financial Viability of a PPP Road Infrastructure Development Project in Kenya

In this section, we analyse the financial viability of the envisaged Thika Highway operation and maintenance concession. We further analyze the financial viability of a hypothetical complete BOT (Toll) road concession using the Thika Highway project data. The analysis is carried out from the private party's (equity holder's) point of view. The main data sources for the analyses are African Development Bank (ADB) reports on Thika Highway development project and CES and APEC (2012) feasibility report on Private Sector Participation (PSP) in Thika Highway operation and maintenance project. Table 4.1 presents a summary of the description of the Nairobi-Thika Highway development project.

Table 4.1: Description of Thika Highway development project

Project Description	**Nairobi – Thika Highway Improvement Project, Kenya**
Construction period	3 years (2008 to 2011) Completion was delayed to 2012
Official launch of the highway	9th November 2012
Project length/Capacity	50.4 km 4/6 lanes of main carriage-way with service roads
Project scope	Construction and Maintenance Sections: Lot 1: Nairobi City Arterial Connectors(Length 12.4 km) Lot 2: Muthaiga to Kenyatta University (Length 14.1 km) Lot 3: Kenyatta University to Thika (Length 23.9 km) (7 Flyovers, 3 Overpasses, 8 Underpasses, 1 Interchange, 9 Foot Bridges)
Contractors	Three Chinese construction companies : China Wu Yi, Sino Hydro, and Shengli
Total cost of the project	US$ 360 million (2012 price)
Land acquisition cost (compensation and resettlement)	US$ 5.20 million (2007 price)
Total construction cost	US$ 349.80 million (2012 price)
Construction cost per kilometer	Approx. US$ 6.94 million per kilometer (2012 price)

Financing sources	African Development Bank = US$ 180 million (Loan of US$ 175 million for civil works and related consultancy services, US$ 5 million grant for feasibility study and detailed design of a mass rapid-transit system for the Nairobi Metropolitan area) Government of Kenya = US$ 80 million Loan from Republic of China (through Exim Bank of China) = US$ 100 million (All at 2012 prices)
Executing government agency	Ministry of Roads and Public Works (MORPW) and Ministry of Transport
Base year	Base year taken for economic evaluation and hence for this analysis is 2008, the year when construction commenced.
Note: *1 US$ = Ksh 84.69 (average exchange rate for year 2012),* **Currency Unit (UA - Unit of Account):** *1 UA = 1 SDR, 1 UA = US$ 1.5326, 1 UA = KES 103.371 (September 2007)*	

Source: ADB (2007), African Development Bank online Publications; Government of Kenya online publications

4.1.1 Financial viability of the envisaged Thika Highway operations and maintenance concession

The envisaged involvement of the private sector in the O&M of the highway means that it partially becomes a PPP road infrastructure project, hence is suitable for this analysis. In the envisaged concession, the private party is expected to construct two toll plazas, operations and maintenance centre, maintain the road plus its facilities, and manage traffic and safety on the highway. A summary of description of the O&M project, as presented in the CES and APEC (2012) Private Sector Participation (PSP) feasibility report on Thika Highway, is presented in Table 4.2.

Table 4.2: Description of the envisaged Thika Highway operations and maintenance concession

Project Description	**Operations and maintenance of Nairobi-Thika Highway, Kenya**
Cost of toll plazas construction	Ksh 670.7 million (2011 price)
Annual routine maintenance cost	Ksh 461.7 million (2011 price)
Periodic maintenance costs	Ksh 1,966.5 million (2011 price)
Toll plaza operation and maintenance cost	Ksh 30.0 million/ year/ toll plaza (2011 price)
Annual inflation rate	6%

Interest rate	14% (Interest rate of debt in Kenya varies from 14% to 22% depending on the project and associated risk. Since this is high revenue generating project and considering concessionaire has access to various sources, interest rate was considered by the consultants for the PSP report as 14%)
Toll indexing every year	5%
Discount rate	A discount rate of 12.0% (the opportunity cost of capital in Kenya was used for the economic evaluation)
Base year	2013 (the year in which construction of the toll plazas were expected to commence).
Concession period	20 years
Note: *1 US$ = Ksh 84.69 (average exchange rate for year 2012)* **Financial Overheads** *Estimation of financial overheads on base cost* *(Equity - 30%, Debt - 70%), Inflation (½ year) 3%, Interest during construction 4.9%, Legal Charges 0.5% , Pre-operative expenses 2%, Independent engineer 1%, Financial charges on debt (2%) 1.4%* **Total = 12.8%**	

Source: CES and APEC (2012)

In the envisaged O&M concession project, the revenue stream is to come from the toll charges that are to be collected from the two toll plazas; to be located next to Safari Park Hotel and at Juja. According to CES and APEC (2012), the toll plaza at Safari Park is to have 16 lanes and the one at Juja is to have 12 lanes. The outcomes of traffic surveys and willingness to pay surveys carried out on the highway were used to determine projections on future traffic volumes and toll rates. The traffic figure of 2012 was taken as the base traffic and projections were done for future streams of traffic from 2013 to 2032 (CES and APEC, 2012). The recommended toll rates are presented in Table 4.3.

Table 4.3: Recommended toll rates for Thika Highway O&M concession (Ksh)

Vehicle Category	Desirable Charges as Per Willingness To Pay	Desirable Charges as Per Revenue Maximization	Recommended Toll Rates	Recommended Toll Rates Per Km
Car	58.30	50	50	1.20
Matatu	82.06	75	75	1.79
Light Commercial Vehicles	82.24	75	75	1.79
Bus	152.97	100	100	2.39
Two Axle Truck	168.44	200	125	2.99

Multi Axle Vehicle	213.36	150	150	3.59

Source: CES and APEC (2012)

From the assumption that only two toll plazas are to be installed on the highway, this analysis makes use of toll rates apportioned according to assigned toll length; toll plaza at Juja (length 23.0 km) and toll plaza at Safari Park (length 18.9 km). Together with the respective projected traffic volumes at the two toll plazas, the apportioned toll rates are used to compute the future revenue streams. The traffic volumes are presented in terms of Annual Average Daily Traffic (AADT), which is the total volume of vehicle traffic of a particular road for a year divided by 365 days. Therefore, to obtain the total annual traffic volume on Thika Highway, the values for AADT are multiplied by 365 days. The analysis also took care of the annual corporate tax of 30 per cent on concessionaire's income (toll revenues), assuming that the O&M project will be done by a local concessionaire. For the analysis, the initial cost for the O&M project of the highway is Ksh 3,158.9 million. This includes the cost of constructing the two toll plazas, the annual routine maintenance costs (for the first year), the first periodic maintenance costs and the toll plazas operations and maintenance costs.

The periodic maintenance is assumed to be carried out after every 5 years during the 20 year concession period, which should have begun in January 2013 (beginning year assumed for this analysis based on the CES and APEC (2012) report). The future cost streams are inflated using an annual inflation rate of 6 per cent. The Net Present Values and the rate of returns on investment in the O&M project are estimated using equation 3.1. The Financial CBA results for the analysis are compared with the Economic CBA results that were obtained by CES and APEC (2012). Financial CBA mainly takes care of the financial aspects of a given investment and ignores the socio-economic costs and benefits. For Economic CBA (used mostly by government in assessing the viability of public projects), socio-economic aspects of the projects have to be put into consideration. We assume that the O&M project is financed wholly by the private party through equity and debt only with equity/debt ratio of 30:70 used by the CES and APEC (2012). The debt interest rate is assumed to be at 14 per cent with annual repayments for a repayment period of 10 years. The Financial CBA results for the analysis using discount rate of 12 per cent are compared with the Economic CBA results as presented in Table 4.4.

Table 4.4: Viability of the envisaged Thika Highway O&M concession project

	Financial CBA	Economic CBA
NPV (Ksh million)	6,936.66	10,383.9
Financial/ Economic IRR	25.9771%	21.0%
Payback Period	8 Years	…
***Note:** 1 US$ = Ksh 84.69 (average exchange rate for year 2012), Information on payback period for Economic CBA not available*		

Source: Author's analysis and CES & APEC (2012).

The results for Financial CBA and Economic CBA indicate that the O&M of Thika High through a PPP scheme is financially and economically viable. The Financial CBA has a positive Net Present Value of Ksh 6,936.66 million, with the private party expected to recoup their investment within 8 years from the beginning of the concession period. The positive cash flows begin in the second year of the concession period. The Economic CBA, on the other hand, has a Net Present Value of Ksh 10,383.9 million. The Financial IRR is about 26 per cent, which is above the Economic IRR at 21.0 per cent. Both internal rates of return are above the discount rate of 12 per cent, an indication that the O&M of Thika Highway through the PPP scheme is viable (profitable) to the private party.

4.1.2 Financial viability of a complete BOT (Toll) road project (using Thika Highway project data)

The same analysis carried out in section 4.1.1 is repeated in this section. However, we now consider a case where the whole Thika Highway development project, from construction to maintenance, is fully financed by a private party. Table 4.1 provides the actual description of how Thika Highway development project was financed and the parties that were involved. As mentioned earlier, the fact that the highway's O&M is expected to be done within the PPP framework makes it suitable for a scenario analysis of a complete BOT (Toll) project in Kenya. Additionally, the reports and documentations on the highway development provide recent and sufficient data to carry out such an analysis, making it easy to relate it with the PPP road projects in the pipeline.

In this scenario analysis, the costs streams for the project now comprises of all the costs involved in a complete PPP road project cycle (such as land acquisition cost, construction cost, operations and maintenance costs, among others). In this case, the private entity designs, finances the construction of the road, then operates and maintains the highway for a concession period of 30 years before handing it back to

the government. Note that the road construction period is not part of the concession period in this case. We assume that the government takes care of the land acquisition (compensation and resettlement) costs and the project preparation costs (feasibility study costs, procurement costs, among others). Therefore, the total capital cost to the private party in this case would be Ksh 30,355.26 million (which includes road construction cost of Ksh 29,624.56 million, cost of constructing the two toll plazas amounting to Ksh 670.7 million and initial cost for Toll Plaza operations and maintenance amounting to Ksh 60 million). The recurrent costs during the 30 years concession period would include the annual routine maintenance costs, periodic maintenance costs (carried out every 5 years) and toll plazas operations/maintenance costs.

Using similar assumptions and parameters used in section 4.1.1, we carry out an analysis using equation 3.1. The analysis produces different results from that of the operations and maintenance concession. The analysis produces a negative NPV of Ksh 31,830.12 million, which indicate that a complete PPP Thika Highway development project, fully financed by the private party is not viable to the private sector investors. The main concern, therefore, would be how to make such important road projects viable to the private sector investors in order to increase their participation in road infrastructure development in the country.

Assuming that the private party is to finance its part of the construction cost through equity only and that the NPV remains the same as that for the O&M concession, further analysis indicate that the government will have to provide a capital grant of at least Ksh 17,639.56 million to at least make the project viable to the private investors, holding other factors constant. This amounts to about 59.54 per cent of the construction costs of the Thika Highway development project. The private party will provide for Ksh 11,985.00 million through equity as part of the construction cost, on top of its financial provisions for the O&M of the highway as discussed in section 4.1.1. The 59.54 per cent is higher than the proposed capital grant for supporting PPP infrastructure projects that are not financially viable to the private sector investors.

In the proposal to provide for viability gap financing by the government, the "viability gap funding for any one project shall not exceed 50 per cent of the total project capital cost, whether the support is funded entirely by the Project Facilitation Fund or co-funded by the sponsoring contracting authority". These results reveal that the 50 per cent provision for Viability Gap Funding (VGF) may not be adequate for some of the PPP road projects, hence there is need for more innovative measures to be taken to enhance the financial viability of the projects to the private sector investors.

Considering the capital that the private party will have to raise for the whole project if the government was to cater for part of the construction cost through a capital grant of Ksh 17,639.56 million, the study further conducted a sensitivity analysis by varying

the equity/debt ratios. The debt interest rate is still assumed to be at 14 per cent with annual instalments for a repayment period of 10 years. The results for the sensitivity analysis are presented in Table 4.5.

Table 4.5: Sensitivity analysis results

Equity/ Debt Ratio	NPV (Ksh Million)	Cash Flows (Year when Positive Cash Flow Begins)	Payback Period (Within the 30 Years Concession Period)
30:70	-3,109.53	2019 with a negative cash flow in 2022 due to periodic maintenance cost	No
40:60	-1,674.37	2018 with a negative cash flow in 2022 due to periodic maintenance cost	No
50:50	-239.22	2015 with a negative cash flow in 2017 and 2022 due to periodic maintenance cost	No
60:40	1,195.94	2014 with a negative cash flow in 2017 and 2022 due to periodic maintenance cost	No
70:30	2,631.10	2014 with a negative cash flow in 2017 and 2022 due to periodic maintenance cost	No
80:20	4,066.26	2014 with a negative cash flow in 2017 due to periodic maintenance cost	Yes (Year 2041)
90:10	5,501.42	2014 with a negative cash flow in 2017 due to periodic maintenance cost	Yes (Year 2038)
100:0	6,936.57	2014 with a negative cash flow in 2017 due to periodic maintenance cost	YES (Year 2033)
Note: *1 US $ = Ksh 84.69 (Average exchange rate for year 2012)*			

Source: Author's analysis

The results presented in Table 4.5 indicate that the viability of the complete highway development and maintenance project improves as the private party increases its equity financing of the project and as the debt financing of the project decreases. As the equity/debt ratio increase from 30:70 to 100:0, the NPV of the project to the private investor improves, the period when the positive cash flows begin become shorter, and the payback period also becomes shorter. These results indicate that building the capacity of the private entities to be able to finance a greater percentage of the PPP road projects through equity would enhance the viability of the projects to them, hence increase their participation in the projects.

The NPV for the case where the private party fully finances the project through 100 per cent equity is equal to that for the envisaged O&M concession of the highway. However, the private investor's payback period is after 20 years from 2013 as opposed to 8 years for the O&M concession. This means that more measures

need to be put in place to improve on the financial viability of the project for the complete BOT (Toll) project at the same level as the O&M concession project.

4.2 Results from the Comparative Study

4.2.1 Description of the countries under study

The comparator countries used in this study were selected through a systematic analysis of the World Bank's Private Participation in Infrastructure (PPI) projects database as presented in the introduction section of this paper. The selected countries used in this study are South Africa, Brazil and India. These countries were chosen mainly because of their great cumulative experience in financing various road infrastructure projects through the PPP scheme in Sub-Saharan Africa, Latin America and the Caribbean, and Asia and Pacific regions, respectively. Therefore, learning from these countries' experience would be important for Kenya in an attempt to enhance road infrastructure development through the PPP scheme. Table 4.6 presents the description of these countries as compared to Kenya.

Table 4.6: Description of the countries under study

Characteristic	Kenya	South Africa	Brazil	India
GDP per capita (current US$), 2013	1,245.51	6,886.29	11,208.08	1,497.55
Inflation, consumer prices (annual %), 2013	5.72%	3.31%	6.20%	10.91%
Risk premium on lending (lending rate minus treasury bill rate), 2013	8.39%	3.42%	18.40%	...
Procedures to enforce a contract (number), 2013	44	29	43.6	46
Ease of doing business index (1=most business-friendly regulations), 2013	137	37	123	140
Length of road network (Km)*	160,886	747,014	1,751,868	4,865,394
Percentage of road network paved (%)*	6.95%	21.28%	12.15%	53.8%(2012)
Note: Information presented on this table was extracted in May 2015				

Source: World Bank (2015b); http://en.wikipedia.org/wiki/List_of_countries_by_road_network_size; https://www.cia.gov/Library/publications/the-world-factbook/fields/2085.html;

The description of the countries under study presented in Table 4.6 indicates that Kenya compares fairly with the other countries in many aspects. Despite having the lowest GDP per capita figure in the year 2013, Kenya had a lower inflation rate than Brazil and India. Kenya also had a lower risk premium on lending as

compared to Brazil and fewer procedures for enforcing a contract than India. Kenya also had a more business friendly regulation than India, but compared poorly against South Africa and Brazil. Length of the road network in Kenya is the shortest compared to the other countries under study, and Kenya also had the smallest percentage of the road network paved. This explains the need for Kenya to explore alternative sources of finance for road infrastructure development such as the PPP initiatives in an effort to bridge the road infrastructure gap.

4.2.2 Financing of the PPP road infrastructure development projects

The comparative analysis results on how the PPP road infrastructure projects are financed in the countries under study are presented in Table 4.7.

Table 4.7: Financial support and fiscal aspects

Characteristic	Kenya	South Africa	Brazil	India
No. of PPP Road Projects (As at First Quarter of 2014)	Bridge: 1 (Mtwapa-Nyali Bridge) In the Pipeline:5 Highway PPPs and Development of 3,000km Roads under Annuity Programme	Highway: 9	Bridge:2 Bridge and Highway :4 Highway :63 Total = 69	Bridge:16 Bridge and Highway :35 Highway :300 Highway and Tunnel:2 Tunnel:2 Total = 355
Total Private Sector Commitments (in current US$ million)	-Information on Mtwapa-Nyali Bridge PPP project not available	US$ 1,785	US$ 44,650	US$ 72,339
Sources of Finance to Private Parties involved in Road PPP Projects	Commercial banks Owners' equity.	Bank loans, equity and government grants	Equity Local development bank -Brazilian National Development Bank (BNDES) Four private banks	Equity Domestic commercial Banks Bond market (highly underdeveloped, lacks liquidity and depth)
Government Financial Support for PPP Road Projects	Project Facilitation Fund Road Annuity Fund	South Africa Project Development Facility South African Infrastructure Fund Guarantee on Debt and Equity	Subsidies PPP Guarantee Fund (FGP) Long-term financing from Brazilian National Development Bank (BNDES)	Viability Gap Funding (VGF) grant Project Development Fund India Infrastructure Finance Company Limited (IIFCL)
Real Interest Rate, 2013	10.94%	2.37%	18.37%	3.80%
Domestic Credit to Private Sector by Banks (% of GDP), 2013	31.55%	67.38%	70.68%	51.87%
Domestic Credit to Private Sector (% of GDP), 2013	31.63%	149.47%	70.68%	51.87%

Fiscal Incentives	No Tax Incentive	PPP Allowance	Tax concessions Special Incentive Scheme for Development of Infrastructure (REIDI)	40% subsidy of project cost 100% tax exemption in any consecutive 10 years
Note: Date of information for Kenya is 2013, South Africa is 2014, Brazil is 2013 and India is 2014				

Source: World Bank (2015a); Republic of Kenya (2015); Republic of Kenya (2010); Government of South Africa (2015); World Bank (2012); Haldea (2013); Queiroz et al (2014); Wentworth (2012); PwC (2013); IEA (2012); http://ppp.worldbank.org/public-private-partnership/financing/government-support-subsidies;http://www.brazil-for-foreigners.com/tax-incentives-brazil/; http://www.ey.com/Publication/vwLUAssets/EY-tax-incentives-in-india; http://www.kra.go.ke/incometax/incometaxincentives.html

The results show that Kenya has had only one complete PPP road infrastructure project; that is, the Mtwapa-Nyali Bridges Concession, which was signed in 1959. The Nairobi Urban Toll Road project, which was to be undertaken through the PPP scheme was cancelled by the government in April 2011 following the withdrawal of financing interest by World Bank. Currently, Kenya is in the process of implementing the PPP scheme on five major PPP road infrastructure development projects. Additionally, the Ministry of Transport and Infrastructure (MoTI) is currently in the process of contracting private entities to develop and maintain about 3,000 km of roads in various parts of the country through the BOT (Annuity) model. This is the first phase of the government's plan to develop and rehabilitate 10,000 km of the roads network within the next five (5) years.

On the other hand, the other countries under study have a big number of complete PPP road projects. South Africa has had 9 highways developed through the PPP scheme. Brazil has had a total of 69 while India has a total of 355 complete PPP road infrastructure development projects (Table 4.7). Comparing these figures with the percentage of road network paved presented in Table 4.4, we realize that India, which has the highest number of PPP road projects, has the highest percentage of road network paved. This affirms that private sector involvement in road infrastructure development can significantly reduce the road infrastructure gap in a country.

The results indicate that the main sources of financing for the PPP road projects for the private parties in all the countries under study are owners' equity and debt from the domestic commercial banks. According to the World Bank indicators for the year 2013, the real interest rates in the countries compare favourably across the countries, with South Africa having the lowest at 2.37 per cent and Brazil having the highest at 18.37 per cent. Despite having the highest real interest rates,

Brazil had the highest domestic credit to private sector by banks as a percentage of GDP in 2013. Kenya had a real interest rate of 10.94 per cent in 2013. The negligible difference between domestic credit to private sector by banks and the total domestic credit advanced to private sector as a percentage of GDP indicate the banks are the main source of credit for the private sector in Kenya. Therefore, measures focusing on increasing accessibility and affordability of credit from the banks would enable the private sector to enhance their participation in the PPP road projects.

In addition to provisions for project facilitation support from the government, the countries under study have put in place measures to improve on the financial viability of the PPP road projects in order to enhance private sector participation in the projects. South Africa has a project development facility and infrastructure fund, through which the private sector is provided with grants to cater for part of the construction costs. South Africa also guarantees debt and equity for the private party. Brazil provides for subsidies on the road project costs and has a guarantee fund for the PPP road projects. Brazil also has Brazilian National Development Bank (BNDES) Infrastructure Project Preparation Fund, financed jointly with the International Finance Corporation of the World Bank (IFC) and BNDES, which was established to finance preparatory activities for infrastructure projects. As a financial institution, BNDES provides well over 50 per cent of long-term financing for infrastructure projects. However, the bank has also been working with the Federal Government to develop the Brazilian capital markets, to encourage both foreign and domestic investors to invest in infrastructure securities.

The Government of India provides support in financing the PPP road projects through Viability Gap Funding (VGF) grant and project Development Fund. VGF is the quantum of financial support provided in the form of a capital grant at the stage of project construction, and is equivalent to the lowest bid for capital subsidy, but subject to a maximum of 40 per cent of the total project cost (Haldea, 2013). There is also the India Infrastructure Project Development Fund (IIPDF), which supports up to 75 per cent of the project development expenses and the India Infrastructure Finance Company Limited (IIFCL) which was set up as a non-banking company to provide long-term loans for financing infrastructure projects with long gestation periods. IIFCL lends up to 20 per cent of the project costs and one half of its lending can also be in the form of subordinated debt, which often serves as quasi-equity. India also has Tamil Nadu Urban Development Fund (TNUDF), which is a sub-national financing intermediary that attracts private finance for on-lending to local governments for infrastructure projects and encourages private-sector co-financing of such projects.

On the other hand, Kenya has the Project Facilitation Fund, which is used to cater for project facilitation costs such financing of feasibility studies, payment of transaction advisors, among others. Additionally, regulations are being developed for the Project Facilitation Fund to provide support for PPP projects that are socio-economically viable but financially not viable to the private sector, through viability gap of up to 50 per cent of the project cost.

Fiscal incentives have also been used by various countries to support private sector investment in the PPP road projects. South African government provides tax incentive to investors in the PPP projects. In this tax incentive, referred to as PPP allowance, qualifying government grants used by the taxpayer to effect improvements to state-owned property are exempt from tax. The allowances are for 25 years; or the period of the lease, whichever is shorter (Wentworth, 2012). In Brazil, tax incentives are commonly negotiable and are granted at federal, state and municipal levels, where both local and foreign investors are generally treated equally in provision of tax incentives. Brazil has tax concessions designed to accelerate development of certain less developed regions, and industries considered to be of great importance to the country's economy. Brazil also has a Special Incentive Scheme for Development of Infrastructure (commonly referred to as REIDI in Brazil). Companies may qualify to benefit from this scheme in the acquisition of goods, construction services and materials (either imported or domestically purchased) which are to be incorporated in their fixed assets. The exemption expires within 5 years counted from the date it was granted (PwC, 2013). In India, Kalidindi and Singh (2009) indicate that there are provisions for subsidy of up to 40 per cent of project cost to make projects viable, and a 100 per cent tax exemption in any consecutive 10 years out of 20 years after commissioning of the project for foreign direct investments in the road sector. Duty free import of high capacity and modern road construction equipment is also allowed. India also provides service tax exemptions on services provided by way of construction, erection, commissioning, installation, completion, fitting out, repair, maintenance, renovation or alteration of a road, bridge, tunnel or terminal for road transportation for use by the general public. In Kenya, we have the investment promotion tax incentives and export promotion incentives. However, none is aimed at promoting investment in the roads sub-sector. The tax incentive closest to the investments in the road sub-sector is the Investment Deduction Allowance (IDA), which was introduced in 1991 to encourage investment in physical capital such as industrial buildings, machinery and equipment (IEA, 2012). There is no tax incentive concerning the corporate tax of 30 per cent for local corporations and 37 per cent for foreign corporations. This is has a negative impact on the concessionaires' toll revenue stream, hence negatively influences the viability of the PPP road projects in Kenya.

Another fiscal policy issue that was found to be of concern in this study is the fuel levies charged in the countries under study. In Kenya, fuel levy has been increased to Ksh 11.00 per litre. The levy is used for road maintenance in Kenya. In South Africa, fuel levy was used to finance road development until April 1987 when the fuel levies were incorporated into the Central Revenue Fund. Currently, fuel levy and all revenues are put into a general budget and assigned to any budget item, while 5 per cent of the total fuel price goes to the Road Accident Fund, which is a state insurer that provides insurance cover to all drivers of motor vehicles in South Africa in respect of liability incurred or damage caused as a result of a traffic collision. During the 2014/15 financial year, the RAF Fuel Levy in South Africa was set at 104 cents per litre, while the total fuel levy amounts to 224.5 cents per litre of petrol sold and 209.5 cents per litre of diesel. In India, the cess levied on petrol and high speed diesel (Central Road Fund) is used as part of finance for National Highways Development Projects (NHDP). The pricing of fuel in India varies by state in addition to central taxes, which are also part of the pump price of fuel. The excise duty and import duty on fuel is paid to the central government while the value added tax, which ranges from 15 per cent to 33 per cent, is paid to the governments of the various states. As a result, approximately 50 per cent of pump price of fuel goes to the central and state governments in the form of different taxes. All these countries have had concerns from the public on the fuel levies, which they consider to be high. This has also led to the concern on double taxation of the public, especially in South Africa and Kenya, as they argue that the fuel levies should be sufficient for road development and therefore the public should not be made to pay toll charges again. These concerns need to be addressed to ensure political and public support for the BOT (Toll) projects for their successful implementation.

4.2.3 Legal and institutional framework

The study results presented in Table 4.8 indicate that Kenya has three road agencies while the other countries have one key road agency each. In Kenya, the government established Kenya Roads Board (KRB) in 1999 to oversee development and maintenance of the country's road network. The Kenya Roads Act was later enacted in 2007 to create three key road agencies, which include Kenya National Highways Authority (KeNHA), Kenya Urban Roads Authority (KURA) and Kenya Rural Roads Authority (KeRRA). These agencies are mandated to develop and maintain major highways, urban roads and rural roads, respectively. On the other hand, South Africa, Brazil and India have one key road agency each, which are South African National Roads Agency (SANRAL), Agência Nacional de Transportes Terrestres (ANTT), and National Highways Authority

of India (NHAI), respectively. The ANTT, which is Portuguese for National Land Transportation Agency, was created in June 2001 with the responsibility of regulating land transportation in Brazil.

Kenya enacted the PPP Act in 2013 to strengthen the environment for implementation of the PPP projects in the country. The main laws currently governing PPPs in the road sub-sector in Kenya are the PPP Act of 2013 and Public Road Toll Act, Cap 407 Laws of Kenya (Republic of Kenya, 2012a). On the other hand, the other countries have had over a decade of implementation of the PPP scheme on road development, with all of them having their first PPP road projects under the respective PPP laws in the 1990s. The countries have developed various regulations for the implementation of the PPP road projects at both the national and local government levels. For instance, in South Africa, the legal framework for PPPs at the national and provincial levels is provided by the Public Financial Management Act of 1999, while the municipal PPPs are governed under the Municipal Finance Management Act of 2003 and its regulations, and the Municipal Systems Act of 2003. In Brazil, the Brazilian PPP Law 11.079/04 establishes general rules for competitive bidding, and contracting private partners at both the national and sub-national levels. However, Kenya is yet to develop the regulations for the local (county) governments.

Table 4.8: Legal and institutional framework in the countries under study

Characteristic	Kenya	South Africa	Brazil	India
Road Agencies/ Institutions	KeNHA; KURA; KERRA Kenya Roads Board (KRB)	South African National Roads Agency (SANRAL)	Agência Nacional de Transportes Terrestres (ANTT)	National Highways Authority of India (NHAI)
PPP Laws	PPP Act 2013 Public Road Toll Act, Cap 407 Laws of Kenya	Public Finance Management Act PFMA Treasury Regulation 16 Public-Private Partnership Manual Standardized Public Private Partnership Provisions Public Private Partnership Toolkit for Tourism Municipal Finance Management Act Local Government: Municipal Systems Act Municipal PPP Regulations Municipal Service Delivery and PPP Guidelines	PPP Law 11.079/04 Main framework: 1. Concessions law 2.Public-Private Parcerías law	PPP Toolkit for 5 Sectors Standard Toll Policy Framework for Special Purpose Vehicle (Consortium) formation

Year of PPP Laws Implementation	2013	1999	1995 concessions 2004 PPP Laws	Early 1990s
Term of the PPP Contracts	10-30 Years	5-30 Years	5-35 Years	4-30 Years
Road PPP Models	BOT (Toll) BOT (Annuity) Operations & Maintenance Concession	BOT (Toll) BOT (Annuity) Comprehensive Toll Road Operations and Maintenance (CTROM) contract model	Concessão patrocinada (Sponsored Concession) - public payments + tolls Concessão administrativa (Administrative Concession) - public payments only	BOT (Toll) BOT (Annuity) PPP model for maintenance of NHs - OMT (Operate Maintain Transfer) model
Procurement Procedures (Standardized Documentation)	Bid and Contract documents yet to be standardized	PPP Manual; the National Treasury's Standardized PPP Provisions and Treasury Regulation 16; Standardized bidding documents for PPP procurement	Standardized bidding documents for PPP procurement	Model Request for Qualification (RFQ) and Request for Proposal (RFP) for the procurement of the preferred bidder; Model Concession Agreements
Key Institutions/ committees for PPP Implementation	PPP Unit PPP Committee Petition committee Cabinet/ Parliament	PPP Unit Government Technical Advisory Centre (GTAC) PPP Committees	PPP Unit Partnership Steering Committee (Comitê Gestor de Parcerias - CGP). Ministry of Finance - National Treasury Secretariat (STN) Technical Committee of Public-Private Partnerships (CTP) Public-Private Partnership Management Council (CGPPP)	PPP Cell, Ministry of Finance Public Private Partnership Appraisal Committee (PPPAC) Cabinet Committee on Investment (CCI) Empowered Committee and Empowered Institution

Source: World Bank (2015a); Republic of Kenya (2015); Republic of Kenya (2010); Government of South Africa (2015); World Bank (2012); Haldea (2013); Queiroz et al (2014); Agarwal (2015); Shaw (undated); http://www.loc.gov/law/help/infrastructure-funding/brazil.php; http://thebrazilbusiness.com/article/; http://www.pppinindia.com/

Additionally, the other countries have formulated PPP toolkits for specific sectors of their economies, which are tailor-made to suit their unique characteristics. In the PPP toolkits, they have established a risk allocation framework for the PPP road projects. However, Kenya is yet to come up with a Public-Private Partnership Manual and a risk allocation framework for the PPP road projects.

The allocation of the risks between the private party and the public contracting authority has a great bearing on the success of the projects. Practically, risk factors differ from project to project. However, there are a number of risk factors that are common to all PPP road projects, which call for risk allocation framework as part of the PPP schemes. The analysis of the risk allocation frameworks through information obtained from the respective countries' PPP unit online publications and various authors such as Tanaka et al (2005), Kalidindi and Singh (2009), Véron & Cellie (2010), Haldea (2013) and Queiroz et al (2014), among other sources, provide an overview of how the risks factors are allocated in South Africa, Brazil and India. Generally, risks allocated to the private sector include: change in general regulations, financial risks, road design, construction process, time and cost overruns, operations and maintenance risks, default risks, and risks associated with insurable force majeure. The public sector is allocated risks associated with land/right of way acquisition, resettlements, license approvals and acquisition of permits, change in scope of work, political and local government support, delay in notification of toll collections, and non-insurable force majeure events. There are few risks factors that are shared by both public sector and private parties across the countries. These include risks associated with construction costs financing, regulation of toll rates and traffic/incident management.

A comparative analysis of the Road Toll policy in the countries indicate that the other countries have standardized their toll road policy, allowing the private sector to collect toll charges directly from the road users, while the Kenyan laws on public road toll do not give the private party authority to effect and collect toll charges directly from the road users. The Public Road Toll Act, Cap 407 Laws of Kenya affirms that any engagement between the public and private party that would lead to charging road users through toll charges must be approved by Parliament. Additionally, the Kenyan Land Act of 2012 is silent on granting of the right of way by the government to the private party (Republic of Kenya, 2012a; 2012b). These results indicate that Kenya still has some legislative work to do to improve on the current legal and regulatory framework for the implementation of the PPP scheme on road infrastructure development in the country.

The PPP models that countries under study have used are basically BOT (Toll), BOT (Annuity) and OMT (Operate-Maintain-Transfer) model for road maintenance concessions. Kenya is also using these models in its PPP scheme. In Brazil, the

PPP scheme is legally structured as a kind of concession, being regulated by the concession law and the PPP law, among other laws (Rocha and Horta, 2005). Brazil has sponsored concession where the private party levy tolls and receive a subsidy to cover part of project costs not covered by user fees and administrative concession where the private party provides a service, preceded or not by a public work, and it is not possible to charge fees. In the administrative concession, government makes payments based on the services received. In India, considerations are being made for adoption of new PPP models that include Modified Annuity (Grant +Annuity+ Toll), Hybrid PPP (Interest free loan + Toll), and BOT model where construction is financed by the government (Agarwal, 2015).

The comparative analysis results also found that South Africa, Brazil and India have standardized bidding and contractual documents for tendering PPP projects. For instance, India has model Request for Qualification (RFQ) and Request for Proposal (RFP) for the procurement of the preferred bidder; and Model Concession Agreements (MCAs) that have enabled it to hasten the procurement process and effectively govern the contractual relationship. The documents have been prepared for different sectors of the Indian economy. However, Kenya is yet to standardize its bid and contractual documents for the PPP projects in various sectors of the economy. The use of standard documents streamlines and expedites decision-making by the concerned parties in a manner that is fair, transparent and competitive.

The results also show that South Africa, Brazil and India have separated the key roles involved in implementing the PPP scheme through various institutions and committees, unlike Kenya. South Africa has the PPP unit, which is charged with the regulatory roles and Government Technical Advisory Centre (GTAC) charged with the role of providing technical assistance. Brazil has the PPP Unit, Partnership Steering Committee (Comitê Gestor de Parcerias - CGP), Ministry of Finance - National Treasury Secretariat (STN), Technical Committee of Public-Private Partnerships (CTP), and Public-Private Partnership Management Council (CGPPP). In Brazil, the Ministry of Planning, Budget and Management (MPOG) assesses, models, and monitors potential PPP projects that have been identified as priorities by the Partnership Steering Committee (Comitê Gestor de Parcerias - CGP). The Ministry of Finance is responsible for appraising any proposed PPP project and making sure that the programme is within the maximum allowable allocation for PPP projects. The responsibilities of the PPP Steering Committee (CGP) include approving the PPP Projects and contracts; authorizing the opening of the bidding process; defining priority services to be provided under PPP arrangements; defining the criteria for analyzing the appropriateness and timing of the contract; setting up procedures for contract award; authorizing the launch of the bids and approving the bidding documents; approving, monitoring and

evaluating implementation of the PPP Plan; reviewing the contract monitoring reports; developing standard bidding documents and sampling PPP contracts; and authorizing the use of the resources of the PPP Guarantee Fund (FGP) to guarantee the government financial obligations (Queiroz et al., 2014).

In India, the institutional framework mainly consists of the PPP Cell located within Ministry of Finance, Public Private Partnership Appraisal Committee (PPPAC), Cabinet Committee on Investment (CCI) and Empowered Committee/Institution. In India, the PPP Cell is responsible for policies, schemes, programmes and capacity building for the PPP scheme and also acts as the Secretariat for Private Partnership Appraisal Committee (PPPAC) and Empowered Institution (EI) for the projects posed for financial support through Viability Grant Fund (VGF). The project proposals are appraised by the Planning Commission and approved by the PPPAC. Empowered Committee/Institution (EC/EI) is an institutional framework comprising an inter-ministerial Empowered Committee, which appraises and approves projects for availing the VGF grant of up to 20 per cent of the cost of infrastructure projects undertaken through PPP. The key functions of the Cabinet Committee on Investment include: identifying key Projects required to be implemented on a time-bound basis, prescribing time limits for requisite approval and clearances by concerned Ministries/Departments; monitoring the progress of identified projects; reviewing implementation of projects delayed beyond stipulated timeframes; reviewing procedures followed by Ministries/ Departments to grant/refuse approvals and clearances; taking decision on grant/ refusal of approvals/clearance of unduly delayed specific projects; and deciding measures for expeditiously granting/refusing approvals/clearance in identified sectors, including simplification of rules/procedures followed by respective Ministries.

However, in Kenya, the institutional framework consists mainly of the PPP unit (which is the secretariat to the PPP committee), the Cabinet, and the PPP committee. In Kenya, all the key roles are currently being handled by the PPP unit. These roles include: regulatory roles; promoting awareness on PPPs in the country; building capacity in contracting authorities in planning, coordinating, undertaking and monitoring PPP projects; conducting research and gap analyses on PPP matters; monitoring liabilities and accounting/budgetary issues related to PPP projects; supporting the PPP committee in its statutory mandate; provision of technical assistance to the government institutions on all aspects of PPP transactions, among others. The Cabinet as part of the institutional framework in Kenya has the responsibility of approving/or not approving the PPP contracts after the negotiations have been done by the PPP committee. The Kenyan Parliament comes in on approval of PPP projects touching on natural resources.

The comparative analysis results also show that the countries under study endeavour to build capacity for both public and private sectors to enhance the undertaking of PPP road infrastructure projects even after years of experience in implementing the PPP scheme. These results affirm the fact that capacity building in any PPP initiative should be an on-going process, hence needs adequate budgetary support. The countries have continued to carry out capacity building through local training forums, national training forums such as National PPP Capacity Building Programme in India, regional seminars, World Bank support programmes, among others. Through the PPP unit, Kenya is also carrying out capacity building in the public sector to enable them to generate, undertake and monitor PPP projects within their respective sectors of operation. However, more needs to be done to increase the capacity to undertake PPP projects in both the private and public sector, and to demystify to the general public the PPP way of delivering public projects, especially in the road sub-sector. This will ensure public and political support for the envisaged PPP road projects, which will ensure their successful implementation.

5. Conclusion and Policy Implications

5.1 Conclusion

This study sought to examine ways of enhancing road infrastructure development in Kenya through the PPP initiatives. The study carried out a viability analysis of the envisaged Thika Highway O&M concession, and a scenario analysis of a complete BOT (Toll) road infrastructure development project in Kenya using Thika Highway development data. Additionally, the study carried out a comparative analysis of successful implementation of the PPP scheme in delivering road infrastructure development projects in South Africa, Brazil and India. This was compared to the Kenyan case.

The study found that the envisaged Thika Highway O&M concession through PPP scheme is financially viable to the private party, if the private party was to fully finance the project. These results support the earlier results for the socio-economic viability of Thika Highway O&M project, which are captured in a feasibility report done by CES and APEC (2012). However, a financial analysis for a complete BOT (Toll) road project, fully financed by the private party from construction to maintenance, using Thika Highway data indicate that the project is not viable to the private party. This affirms the need for the government to put in place innovative measures to enhance the viability of such important road projects, and to attract more private sector investment in the road projects. The comparative analysis results point out that South Africa, Brazil and India have established measures such as provisions for Viability Gap Funding (VGF) grants or subsidies to cater for part of the construction costs, guarantees on debt and equity for the private party, and long-term loans for financing infrastructure projects that typically involve long gestation periods and tax incentives.

The study found that all the countries under study have embraced similar PPP models; that is, BOT (Toll), BOT (Annuity) and OMT (Operate-Maintain-Transfer) model for road maintenance concessions. However, India is currently making considerations for adoption of new PPP models that include: Modified Annuity (Grant +Annuity+ Toll), Hybrid PPP (Interest free loan + Toll), and BOT model where construction cost is to be financed by the government.

The study also found that the countries under study have developed PPP manuals and toolkits covering risk allocation frameworks, and standardized bid and contractual documents for the various sectors of their economy where the PPP scheme is being used. Additionally, the countries have developed regulations to govern PPP projects at both national and local government level, and standardized their toll road policies. However, Kenya is yet to develop a PPP toolkit and standardized bid/contractual documents. Additionally, Kenya has not harmonized

laws governing road tolling, such as the Public Road Toll Act Chapter 407 Laws of Kenya, and the Kenya Land Act of 2012. These could pose some challenges in implementing PPP road infrastructure projects in Kenya.

The study found that unlike Kenya, the other countries under study have separated the key roles involved in implementation of the PPP scheme in delivering road infrastructure projects. The study noted that the key roles such as the regulatory roles and technical assistance roles in the PPP scheme should be handled by separate institutions to avert the possible problems of conflict of interest and lack of independence in executing the key roles.

However, the study found that all the countries under study, except Kenya, have established one key road agency each through which they have consolidated their resources and regulations for the PPP road infrastructure projects. On the other hand, Kenya has three road agencies, hence has to divide the regulatory roles and resources for road infrastructure development among the three agencies. This means that a contract agreement entered by a private party with one road agency may not be binding to the others. In cases of toll road projects, another road agency building alternative route, which could divert traffic from the toll road, may lead to increase in revenue risks to the private party that has invested in the toll road project.

The study results affirm that building capacity for both public and private sector to undertake PPP road infrastructure projects is a continuous process, and is important in enhancing the implementation of the PPP projects across various sectors. In Kenya, the PPP unit is also carrying out capacity building in contracting authorities in planning, coordinating, undertaking and monitoring PPP projects. However, it is not clear what the PPP unit has achieved so far in building capacity in both public and private sector, and promoting awareness on PPPs in the country. Promoting awareness of the PPP way of delivering public projects will ensure goodwill for projects from the public, the country's political leaders, and all stakeholders involved in the projects to their success.

5.2 Implications for Policy

The policy recommendations from this study that should be pursued to enhance road infrastructure development in the country through the PPP initiative include:

- Government should enhance provision of financial support for PPP road infrastructure projects on top of the project preparation support. The proposal for viability gap funding of up to 50 per cent of the total project capital cost through the Project Facilitation Fund is a step in the right direction. However, this study indicates that some projects might need more

than 50 per cent financial support. Therefore, the government should look at alternative measures that can help the private sector investors access long term financial support for the PPP road infrastructure projects. For instance, the government should establish a local development bank to provide long-term loans for financing infrastructure projects, with long gestation periods that the domestic commercial banks would not be willing to finance.

- Since each road infrastructure project has its own unique characteristics depending on where the road is located and other factors, the government should consider additional PPP models for the road sub-sector that are to be applied on case by case basis depending on the feasibility study results for the PPP road project. The government should consider a new Hybrid BOT model that incorporates both the BOT (Toll) model and the BOT (Annuity) model. In this model, the construction cost for mega road projects, such as the Thika Highway would be recovered through the annuities payable by the government over a period of time, while the operations and maintenance costs would be covered through the toll collections. In this arrangement, the private party would be required to pay concession fees to the government should the toll revenues surpass an agreed revenue cap.
- The government should hasten the formulation of a comprehensive PPP manual to provide a tailor-made framework for risk allocation, standard bidding and contractual documents for all the sectors of the economy where PPP scheme is being applied. The formulation of the regulatory framework to guide implementation of PPP projects at the county level should also be fast-tracked. The laws on public road toll should be reviewed to give express authority to the private party to effect tolls charges and earn revenue directly from the toll stations. The Kenya Land Act of 2012 should also be reviewed to grant a temporary right of way by the government to the private entity. Granting of the right of way to the private party through the concerned road agency will provide an opportunity for the private party to diversify sources of revenue from the road projects by using the right of way for commercial purposes such as leasing it for fiber optics, billboards, vehicle and travellers' services, among others. This will help reduce the revenue risk, which is a particular concern to private parties in BOT (Toll) road projects.
- The regulatory functions and technical assistance roles currently carried out by PPP Unit should be separated to avert possible conflict of interests likely to emanate from the execution of the two key roles. The PPP unit should remain with a key role of a regulator of all National Treasury approvals on procurement, development of tender documents, selection of preferred bidder and approving execution of negotiated PPP projects. On the other

hand, there should be a government institution/department/committee charged with the responsibility of providing technical assistance on procuring consultants, project procurement, considerations for government financing support, and monitoring of the implementation of the PPP road projects. In separation of roles for the PPP scheme, Kenya should draw lessons from the countries under study, especially South Africa, which initially had its PPP unit carrying out all the key roles but later on created Government Technical Advisory Centre (GTAC) to take care of the technical assistance roles.

- When procuring BOT (Toll) road projects, all road agencies concerned with the roads in the local road network where the project is being undertaken should be engaged.
- There is need to take stock of what the PPP unit has achieved so far in building capacity of the contracting authorities to undertake PPP projects in the road sub-sector, and make provisions for enhanced capacity building in both public and private sector on the PPP scheme. Such trainings and awareness creation should also target the general public to demystify the PPP way of delivering public projects so as to attain public and political support for the envisaged PPP road projects. The awareness creation should be targeted at addressing the concerns on double taxation arising from the fact that the road users are already paying fuel levy, yet they are also required to pay toll charges whenever they use toll roads.

5.3 Study Limitations and Areas for Further Studies

This study faced the challenge of limited data and information on a complete PPP road infrastructure development project in Kenya. Therefore, the study made use of available data on the Thika Highway development (in view of the envisaged application of the PPP scheme in its operations and maintenance concession) to examine the private entities' assessment of PPP road infrastructure development projects in Kenya. The study also carried out a comparative analysis of Kenya's PPP scheme with that of South Africa, Brazil and India. To complement the findings from this study, there is need to further carry out a survey targeting the private sector investors in PPP road projects (such as contractors, constructors and the financial institutions) to analyze the challenges to their greater participation in the PPP road infrastructure development projects in Kenya. Additionally, there is need to study the various aspects of PPP road projects that majorly influence the decision of lenders when making debt financing decisions for PPP road projects in Kenya.

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