



UNIVERSITY OF ZIMBABWE
DEPARTMENT OF ACCOUNTANCY

**Road Infrastructure Development Funding Models: A Comparative Case Study of
Zimbabwe National Road Administration and South African National Roads Agency
SOC Limited**

SUBMITTED BY:
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**A dissertation submitted in partial fulfilment of the requirements of the degree of
Master in Accountancy**

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DECLARATION

I, **Mudodo Anywhere**, do hereby declare that this dissertation is the result of my own investigation and research, except to the extent indicated in the acknowledgements, references and by comments included in the body of the report, and that it has not been submitted in part or in full for other degree to any other university.

Student Signature Date.....

Supervisor Signature..... Date.....

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ABSTRACT

The study made a comparative assessment of the road infrastructure development funding models between ZINARA and SANRAL of South Africa. There is a lack of a properly designed road infrastructure development funding model in Zimbabwe that has seen an overreliance on one funding model that has failed to attract adequate funding as evidenced by road maintenance backlog and impassable roads. As such, the study made an attempt to identify possible funding models that can be utilised to improve road infrastructure development in Zimbabwe. The study also looked at case study funding models that are being used by SANRAL which could be adopted in Zimbabwe.

In order to ascertain whether there are significant differences between the revenue turnover of ZINARA and SANRAL, a hypothesis test was carried in order to give recommendations on the most appropriate models that ZINARA can adopt. A descriptive survey research that utilised a structured questionnaire was used to lobby the opinions of research participants in government and local authorities. A stratified purposive sampling comprising of individuals in government departments and local authorities like Rural District Councils (RDCs) and Urban Councils (UCs) was used to build a representative sample from the target population. Interviews with the management and employees of the aforementioned groups were also utilised as a complimenting process to the administration of the structured questionnaire.

Out of the eight investigated possible international funding models that are in use in both developed and developing countries, the study established the use of public financing, private financing, PPPs and infrastructure bonds as the most suitable models for adoption in Zimbabwe. On the other hand, national treasury, concessions through PPPs, capital market borrowings and direct foreign investments are the South African road infrastructure funding models that Zimbabwe (ZINARA) can use in order to improve its road infrastructure status. It is therefore evident that public financing, private financing, public-private partnerships and infrastructure bonds are the international funding models that can be adopted and implemented by the ZINARA. From a regional perspective, Zimbabwe should adopt national treasury, concessions through public-private partnerships, capital market borrowings and direct foreign investments as funding models for better road infrastructure. The government of Zimbabwe should therefore explore concessions to private players to fund the construction of major state highways.

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GLOSSARY OF ABBREVIATIONS

DDF	District Development Fund
DOR	Department of Roads
MOTiD	Ministry of Transport and Infrastructural Development
NZCID	New Zealand Council for Infrastructure Development
RDC	Rural District Council
SADC	Southern African Development Community
SD	standard Deviation
SANRAL	South African National Roads Agency SOC Limited
UC	Urban Council
ZINARA	Zimbabwe National Road Administration

CHAPTER 1

1.0 INTRODUCTION/BACKGROUND TO THE RESEARCH

1.1. Introduction

The research seeks to explore road infrastructure development funding models as part of looking into domestic resource mobilisation for infrastructure development. The funding of infrastructure has been a topical issue in Africa, major attention being given to funding of road networks. The purpose of this research is to seek an understanding of road infrastructure development funding models so as to recommend an appropriate model for Zimbabwe. A comparative analysis was conducted using the case study of two road funds, which is Zimbabwe National Road Administration (ZINARA) in Zimbabwe and South African National Roads Agency SOC Limited (SANRAL) in South Africa. The major focus of the research is to bring out to the fore the proper road infrastructure funding models that are suitable for Zimbabwe. Providing an appropriate funding model is key to the government, infrastructure development investors and the general public.

1.2. Background to the study

The controversies or challenges which are currently faced in trying to harmonise or standardise accounting practices are also faced in the field of engineering on both financing and maintenance standards for road infrastructure development. Notwithstanding having global associations like the World Road Association which prescribes various important attributes of road maintenance including having a profound funding models, many countries are finding it difficult to secure a stable funding for road infrastructure. Some of the models which were implemented in developed countries failed to deliver results despite them being sound models, for example the earmarking system which was based on user pay principle failed to deliver results in the late 1960s in countries like New Zealand, Japan and United States. Many developing countries adopted these models in late 1990s but still the models are failing to secure stable resources (World Bank Group, 2008).

The World Road Association (2015), published the International Climate Change Adaptation Framework for road infrastructure development, however reviews by the association shows that countries are at different levels in implementing the framework due to different legal and regulatory frameworks. In addition, the association acknowledges that there are still various

set of funding models and implementing (maintenance) models from country to country. In Zimbabwe, there is currently a total road network of 87 654 kilometres, comprising of 18 460 kilometres state highways, 8 194 kilometres urban roads and 61 000 kilometres rural roads which should be maintained by road authorities. There are three categories of road authorities, which are local authorities, Department of Roads (DOR) and District Development Fund (DDF). In local authorities category there are Rural District Councils (RDCs) and Urban Councils (UCs). The road authorities fall under different government ministries as follows local authorities are under the Ministry of Local Government and Public Works, DDF is under the Office of President and Cabinet while DOR is under the Ministry of Transport and Infrastructural Development (MOTiD). While road authorities have been solely given the mandate for road infrastructure development by government, the duty to raise funding for their activities has been allocated to an independent body which is responsible for fixing and collecting road user charges. This duty is done by the Zimbabwe National Road Administration (ZINARA) which is a parastatal under the MOTiD. As a result of the above set up, there is a gap between road authorities' funding requirements and ZINARA funding capacity (ZINARA Magazine, 2012).

Despite having ZINARA and road authorities on board for the past ten years, the country's road infrastructure continued to deteriorate and most roads are impassable. Some of the road infrastructure which have been destroyed by cyclone Eline in 2000 had not yet been repaired or attended. The backlog is attributed to constrained budget for road maintenance which had remained constant at an average figure of \$36 million for the past seven years. The budget is mainly from road user charges, which comprise of toll fees, vehicle licences fees, abnormal load fees and fuel levy (ZINARA Magazine, 2012).

The above challenges and complexities have prompted this research to understanding funding model for infrastructure development which could be appropriate for Zimbabwe, through a comparative case study of ZINARA and SANRAL. SANRAL was selected because South Africa is leading in the field of road infrastructure development in the Southern African Development Community (SADC) region. Further to this, South Africa is our neighbouring country, a major trading partner of Zimbabwe and has got some similarities both in climatic and historical events. The Association of Southern African National Roads Authorities (ASANRA) has called on countries in the region to use road signs that are approved by the SADC to reduce road carnages that have caused deaths of thousands of people. However, research by the World Bank has shown that the SADC approved signs are basically South

African road signs (World Bank, 2011). As such, the research will explore critical success factors which are driving South Africa to be a leader in infrastructure development with particular attention to funding models.

1.3. Statement of the problem

This dissertation addresses the overall problem of lack of a well-designed funding model for road infrastructure development in Zimbabwe. To be more specific, the problem is overreliance on one funding model that is the user-charge principle which has failed to bring adequate funding as evidenced by road maintenance backlog and impassable roads. The Roads Act (Chapter 13:18) provides for the establishment and constitution of ZINARA. It gives the same the responsibility to fix road user charges and to collect such charges or any other revenue of the Road Fund. However, the charges to be levied should be gazetted before ZINARA starts collecting such fees. The current scenario is that charges are being gazetted without taking into account road authorities funding needs requirements. As a result of the above there is currently huge unmet financial obligations and an unsound financial management systems, inefficient and unjustifiable funds distribution structure. The research will seek to respond to the above problems by evaluating the appropriate funding models.

1.4. Research Objectives

The research will seek to:

1. To assess the current funding model for roads development in Zimbabwe.
2. To determine the challenges or benefits of the models.
3. Conduct a comparative analysis of ZINARA and SANRAL funding models;
4. Evaluate available global funding models for road infrastructure development for use in Zimbabwe.
5. Reach a conclusion of the alternative funding models that can be adopted and utilised by ZINARA (Zimbabwe).

1.5. Research Questions

1. What are some of the global funding models of road infrastructure development?
2. What would be the ideal funding models for ZINARA?

1.6. Hypothesis of the Study

Null Hypothesis: road funding models used in Zimbabwe by ZINARA are not the same to those used in South Africa by SANRAL.

Alternative Hypothesis: road funding models used in Zimbabwe by ZINARA are the same to those used in South Africa by SANRAL.

1.7. Scope of the study

The research is a comparative analysis of ZINARA and SANRAL, which focus on road infrastructure development models. The study will first identify funding models available internationally on a global scale and narrow them down to regional jurisdictions. The final aspect will be analysing the already adopted models in South Africa and try to model them to Zimbabwe environment. The research will also recommend some of the models used internationally that can be adopted by Zimbabwe. The dissertation will also briefly discuss new road maintenance approaches that can be used by various road authorities to achieve outputs set in the Zimbabwe Agenda for Socio- Economic Transformation (ZIM-ASSET) economic blue print.

1.8. Significance of the study

The idea of forming road fund in Africa is a borrowed concept from developed countries. Harai, Wright and Sorel (2004), submitted that in 1954 to address the poor state of the road network, Japan introduced a series of road improvement programs, together with a special funding system for roads. The funding system for roads included earmarking certain road-related taxes and depositing them into a special off-budget account, or road fund. In New Zealand a series of evolution occurred that finally led to the establishment of Transfund New Zealand. However, despite all these initiatives, the challenges of inadequate funding could

not be addressed since they relied mostly on earmarked revenues. Moreover, despite the global associations like the World Road Association prescribing various important attributes of road maintenance including having a profound funding models, many countries are finding it difficult to secure a stable funding for road infrastructure. Some of the models which were implemented in developed countries failed to deliver results despite them being sound models, for example the earmarking system which was based on user pay principle failed to deliver results in the late 1960s in countries like New Zealand, Japan and United States. Many developing countries adopted these models in late 1990s but still the models are failing to secure stable resources (World Bank, 2011).

Given the above history of failure by road funds to secure adequate funds, the African states in general went on to adopt the same principle in the late 1990s. ZINARA and SANRAL were established in 2002 and 1998 respectively on the same concept to that of developed nations. As such, the significance of the study rests on the idea that most of the funding models that are currently being used both in Zimbabwe and South Africa having been used elsewhere and some have failed to yield results.

In addition to the above, both ZINARA and SANRAL are road fund agents established by an Act of Parliament and given almost similar responsibilities. However, in terms of the performance outcomes South Africa has got a better road network as compared to Zimbabwe. This research study is going to critically analyse funding models that are available for road maintenance internationally and in South Africa and narrow them down to Zimbabwe environments. Because of some similarities, comparative analysis will be done to identify funding critical success factors of South Africa and try to model them to be adopted by Zimbabwe.

1.9. Overview of the research methods

The overall research design follow a case study approach using ZINARA and SANRAL. This method was considered appropriate to allow comparative analysis between the two road funds so as to understand the funding model in South Africa in more detail. The approach permits identifying gaps which allows constructing appropriate model for Zimbabwe. This will be followed by a description of the data sources and the reason why this population and sample size were chosen. The data collecting instruments will be described and an outline of

how data was presented, analysed and interpreted will be given. Chapter 3 will provide more detailed information.

1.10. Chapter Summary

Beyond this Chapter 1, the result of this dissertation is structured as follows:

Chapter 2 provides Literature Review which examines the literature around the subject of road infrastructure funding models.

Chapter 3 details the Research Methodology which deals with how the research would be carried out. The chapter has the following sections, Introduction, Research Design, Study Population, Sample population, Research Instruments, Validity and reliability of research instruments, Data Collection Procedures, Ethical Considerations, and Research Limitations.

Chapter 4 provides the Research Results and Findings. The chapter presents the results and their analysis and discussion in relation to literature reviewed in this study.

Chapter 5 presents the conclusion and recommendations of the research.

CHAPTER 2

2. LITERATURE REVIEW

2.1. Introduction

This chapter provides a review of literature on funding models for road infrastructural development. The literature focuses on providing the various funding models citing their strengths and weaknesses. There are a number of challenges that can be associated with funding infrastructural development, which are explored in this literature review. The proceeding sections explore literature on road infrastructure development funding models.

2.2. Infrastructural Development Funding

Infrastructure can be defined as the structures and facilities that are necessary for the functioning of the economy and society (Egert, Araujo and Kozluk, 2009). According to European Commission (2011), infrastructure supports economic activity and social services, rather than being an end in itself. Economic infrastructure refers to the physical infrastructure that is a direct input to economic activity, for example roads, electricity networks, telecommunication networks and water and sewerage facilities. Social infrastructure refers to the facilities that aid the provision of social services, such as schools, clinics and hospitals.

A World Bank Development Report (1994) which focused on infrastructure for development, studied investments in public works (major dam and canal works for irrigation, and roads). The World Bank surveyed low, middle, and high-income countries. Infrastructure services represent a large share of the economy, accounting for value-added of roughly 7 to 11% of Gross Domestic Product (GDP), with transport comprising about 5 to 8% of total employment (World Bank, 1994). Public infrastructure investment ranges from 2 to 8% (and averages 4%) of GDP. For developing countries, infrastructure typically represents about 20% of total investment and 40 to 60% of public investment. The report stated that even these shares understate the social and economic importance of infrastructure, which has strong links to growth, poverty reduction, and environmental sustainability. The World Bank Report (2010) on Africa's Infrastructure indicated that Africa's infrastructure lags well behind that of other developed countries. Not only is Africa's infrastructure networks, but the price of the services provided is also exceptionally high by globally standards. OECD (2006) reported

that meeting Africa’s infrastructure needs calls for a very substantial program of infrastructure investment and maintenance.

According to Brineco-Garmendia et al., (2008), the public sector remains the dominant source of finance for road infrastructure. Public investment is largely tax financed and executed through central government budgets, whereas the operating and maintenance expenditure is largely financed from user charges and executed through state owned enterprises. Current levels of public finance are substantially higher to GDP, typically absorbing 5-6% of total GDP. Looking only at investment, one finds that official development assistance, private participation in infrastructure and non-OECD financiers together exceed domestically financed public investment (Brineco-Garmendia et al. 2008). The private sector is by far the largest source, on a par with domestic public investment.

The concluding report from the United States Army Corps of Engineers (1995) stated that infrastructure studies identified the following public works goals as the primary objectives to guide the infrastructure development; (1) efficiency, (2) reliability, (3) equity, (4) sustainability, (5) innovation, and (6) revenue diversification. The report went on to state that within a broader context, the preceding objectives are complemented by two overarching goals that serve as national outcome-based performance indicators, i.e. productivity growth, and competitiveness and jobs. In assessing the state of the infrastructure, the United States Army Corps of Engineers (1995) identified a number of barriers that inhibit action on improving the infrastructure:

Public works maintenance is often one of the first spending cuts made in times of tight budgets.

Box 1: Barriers that inhibit improving the infrastructure

- | |
|---|
| <ol style="list-style-type: none">1. Capital investment in public works continues to be viewed sceptically by many as “pork barrel” spending (meaning that it is viewed as the act of using government funds on local project that are primarily used to bring more money to a specific representative's district basically the politician tries to benefits his/her constituents in order to maintain their support and vote).2. Constrained budgets at all levels of government seem to render even modest programs and projects unaffordable. |
|---|

3. Significant advances in technology are prevalent, yet liability, regulatory, and contracting concerns have resulted in relatively few innovative public works applications.
4. The accumulation of national (federal) and state regulations and mandates threatens to distort local budgets and priorities.
5. The implementation of necessary environmental statutes has created a complex series of public works decision-making processes that often appears gridlocked.

Source: United States Army Corps of Engineers (1995)

A study carried out by Army Corps of Engineers (1995) established that the following principles are needed or must be considered for the state and local agencies involved in federal programs for the funding of infrastructure;

Box 2: Considerations for funding infrastructure under Federal programs

1. Cost-effective management and maintenance - Adopt and encourage performance measurement and assessment process, as well as maintenance planning and reporting practices to reduce long-term costs through early identification of maintenance needs.
2. High-quality investments - Obtain maximum benefits compared to costs from all federal infrastructure programs (directly provided, financially assisted, or regulated) through the use of investment analysis.
3. Budget-sensitive financing - Federal infrastructure investments should be identified through the preparation of financial plans and affordability analyses early in the planning process, with full consideration of both traditional and non-traditional funding sources, including demand management options to ensure efficient use.
4. Innovative technologies - Clear the path to the marketplace for new technologies through an explicit, singular federal research and development strategy that provides a strong link between the development and adoption processes, enhances the partnership between the federal research community and the private sector, and addresses the liability, regulatory, and contracting barriers to innovation diffusion.

Source: United States Army Corps of Engineers (1995)

2.3. Infrastructural Development Funding Models

2.3.1. Public financing

According to Chakrabarty (2013), public financing can take the form of general budget appropriations for infrastructure projects financed through tax revenue or government debt, revenue bonds tied to specific infrastructure projects, or infrastructure investment by Government Trading Enterprises (GTEs), including National Development Banks (NDBs). Developing countries may also have access to concessional and/or non-concessional financing from Multilateral Development Banks (MDBs), such as the World Bank (World Bank, 2012).

According to the HM Treasury (2012), in many countries, public financing of infrastructure through the budget appropriation process is common. Budget appropriation has the benefit of a generally higher level of transparency and public scrutiny compared with other government financing vehicles, with the result that there is greater accountability over public expenditure. Given the lower cost of government debt compared with private sector debt; it can also be a cost-effective way of financing infrastructure. On the other hand, Chan, Forwood, Roper and Sayers (2009) argued that there can be constraints on infrastructure investment from budgetary processes, such as fiscal rules (e.g. debt or deficit limits), as well as political pressures to undertake particular investments irrespective of an appropriate cost-benefit analysis. Privatisation of existing assets has also been utilised to unlock public financing for new infrastructure projects. However, a strong regulatory framework needs to be in place if a natural monopoly is privatised.

World Bank (2010) reported that many countries also engage in various types of quasi-government financing. In both advanced and developing economies, this form of financing is most commonly provided by GTEs, which are legally independent entities at least partially owned and overseen by government. Many GTEs have a core function of operating and maintaining infrastructure assets. Some GTEs also have responsibility for building new infrastructure assets. Chong and Poole (2013) held that GTEs finance their infrastructure investments through several sources, including retained earnings from user charges and fees for access to infrastructure; capital contributions or payments from government for non-commercial services that GTEs are directed to provide; bond issuance; or borrowing from banks. World Bank (2012) argue that GTEs can be more efficient and make better investment

decisions than the general government sector since they are typically managed by boards with financial and technical expertise. However, Chan, Forwood, Roper and Sayers (2009) argued that GTEs also have some shortcomings. First, those GTEs operating monopoly infrastructure may lack incentives to seek out efficiency gains and to modernise services and facilities. Second, in some countries, the capacity for GTEs to raise their own debt rather than relying on the government's budget for funding has risen concerns over the circumvention of budget accountability measures.

Reserve Bank of India (2012) alluded that GTEs can give rise to large contingent liabilities for governments since it can be politically unpalatable to let GTE-financed infrastructure projects fail. Governments and GTEs can also link borrowing to specific infrastructure projects. Commonly, a distinct company will be set up to carry out the project and issue bonds (known as revenue bonds). This debt is serviced from the income stream of the infrastructure project – user charges or government/ GTE payments – without recourse to general government or GTE revenue. Reserve Bank of India (2012) reported that the main benefit of revenue bonds is the potential they bring for efficiency improvements in project management due to the greater scrutiny by investors; however, compared with general budget appropriation, they can be a more costly way of financing infrastructure given that bondholders require a higher return for the greater risk faced relative to general government bonds. As with GTEs, revenue bonds can give rise to implicit contingent liabilities for governments where projects are considered too important to fail (World Bank, 2012)

2.3.2. Private financing

Infrastructure projects financed by the private sector fall into two categories; those that are fully owned and operated by the private sector, for instance private telecommunications networks; and those commissioned by government but at least partly financed by the private sector (World Bank 2012). Private financing comes in two forms – debt and equity. Debt constitutes a large proportion of infrastructure financing, with this proportion usually depending on the stability and predictability of income flows; debt funding has reached up to 90 per cent of total funding for Public-Private Partnerships (PPPs) social infrastructure projects where government payments for the infrastructure services are stable and predictable (Chan et al 2009 and Brooks, Liebman and Schelling, 1984). Debt financing is typically made up of loans from banks, although some private projects have been partly funded via bond issuance in capital markets, especially in Europe (EPEC 2010).

Inflation-linked bonds are often seen as a good fit for infrastructure projects from the point of view of the issuer since the pricing of infrastructure services is often linked to inflation, as well as for investors such as pension funds given the sensitivity of their long-dated liabilities to inflation (Lancaster and Dowling 2011). Equity investors in private projects can be classified as primary or secondary investors. Primary investors are directly involved in decisions regarding the construction of the infrastructure asset, such as construction companies. Some projects may also raise equity on financial markets through an initial public offering. Croce (2012) maintained that a recent development in the equity financing of infrastructure projects has been the involvement of large pension or superannuation funds, some of which have invested directly in an equity stake at the start-up phase of the project. Once projects are in operation with a proven revenue stream, equity is often sold in the secondary market to investors with a lower appetite for risk; infrastructure funds and pension funds generally prefer to invest at this stage of the project. Selling proven assets allows primary equity investors to free up capital to invest in new infrastructure projects (Croce, 2012).

According to Croce and Gatti (2012), compared with provision by government, there are a number of potential benefits of private parties being involved in infrastructure projects. Most importantly, the private party can help to deliver projects on time and at a lower cost over the life of the asset. When it comes to project financing, the involvement of the private sector allows governments to pursue projects even when facing short-term fiscal constraints. However, in the absence of user charges, McKinsey Global Institute (2013) argued that PPPs will have long-term impacts on the government's budget due to the commitment to make payments to the private partner for the services generated by the infrastructure asset. In many PPPs projects, private parties have sole responsibility for the financing component of the project, although some projects may receive support in the form of government capital grants, loans from development banks and credit enhancement, such as government guarantees.

2.3.3. Public-Private Partnerships (PPPs)

According to Hodge and Greve (2005), public-private partnerships, as the name suggests, aim to provide a means by which such synergy between the two sectors may be achieved in

reality. Meaney and Hope (2012) argued that there have been almost as many attempts to define PPPs as there have been PPP projects, and there are widespread differences in what the term is taken to encapsulate. OECD (2010) has provided a definition that distinguishes PPPs from more traditional procurement methods on the basis of the amount of risk transferred to the private sector.

OECD (2007) defined a public-private partnership as an agreement between the government and one or more private partners according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners.

Grimsey and Lewis (2004) alluded that the difference between PPPs and traditional public procurement models is that the public sector does not purchase an asset in a PPP; rather it purchases a stream of services under specified terms and conditions. In other words, the private sector finances and builds the infrastructure, and it retains ownership of the asset at least until the end of the contract (usually around 20–30 years). Meaney and Hope (2012) argued that different models fit within the broad PPP concept but, in line with the definition above, the operation of the asset is always the responsibility of the private sector. Each of these models allocates different levels of risk to the private sector. Meaney and Hope (2012) illustrate the role of financing the project which falls to the private sector, as follows:

Build-Develop-Operate - The private sector party buys or leases an existing asset from a public agency, invests capital to enhance and develop the infrastructure, and then operates it according to the terms of a contract with a public agency.

Build-Own-Operate - The public agency awards a single contract which bundles the construction and operation of the infrastructure to a private entity. The public agency is responsible for specifying the design of the project, but ownership of the asset remains with the private agency once it is built.

Build-Operate-Transfer - The private entity is responsible for the construction of the infrastructure according to the design specifications agreed to by the public agency and subsequently operates the infrastructure for a specified period of time under a contract or franchise agreement with the agency. At the conclusion of the contract, ownership and operation of the infrastructure is transferred to the public agency.

Build-Own- Operate and Transfer (BOOT) is a public-private partnership (PPP) project model in which a private organisation conducts a large development project under contract to a public-sector partner, such as a government agency. A BOOT project is often seen as a way to develop a large public infrastructure project with private funding.

Engel, Galetovic, and Fischer (2011) cited in Basso and Duvall (2014) discussed how effective public- private partnerships for infrastructure financing can significantly reduce government costs; and David Levinson and Matthew Kahn (2011) proposed a new, more-efficient system for investing in infrastructure projects. A just-released report from McKinsey Global Institute estimates that the global infrastructure need could be reduced by 40 percent by adopting more-sophisticated approaches to selection, delivery, and operations of infrastructure systems, including surface transportation (Dobbs et al. 2013). Given how large the U.S. surface transportation system is already, it is likely that the U.S. figure is even higher than the global figure. While national policy in these areas can be quite important, state and local governments control non-revenue decisions even more directly.

The use of PPPs essentially by including the private sector in the implementation of road infrastructure development projects would also help to convince the public that private involvement or other forms of non-traditional funding or delivery are appropriate. There have been attempts to involve the private sector in the creation of public infrastructure but not with the commitment, consistency, or legislative protection that would encourage and protect private sector investment and encourage long-term partnerships (DCoG, 2010).

Other governments (Australia, Brazil, Canada, Mexico, Finland, UK, Malaysia, Indonesia, Thailand, Philippine, etc.) have managed to establish mechanisms and controls that allow the involvement of the private sector in the provision of some public infrastructure (Sihombing, 2008). Control and public benefit are secured through legislation and a strict method of measuring the benefits of the non-traditional approach. Meaningful involvement by the private sector is, however, not automatic. Experience in other countries has shown that important prerequisites for such financing are political commitment; enabling legislation that can be readily applied; an evaluation framework; expertise; project prioritisation; risk management; and standardisation (Leach, 2010).

2.3.3.1 Cost of PPP financing

According to Grimsey and Lewis (2007), one of the perennial objections to PPPs is that private sector financing costs are higher than the government's cost of debt, and hence PPPs

are more expensive to finance than traditional public procurement. Thus, the argument goes, PPPs will deliver overall cost benefits only where the private sector is able to generate substantial efficiencies in operations. For example, Parker and Hartley (2003) state that Governments can always borrow more cheaply than the private sector. It was further elaborated that for PPPs to produce overall cost savings, therefore, the extra financing cost needs to be offset by savings in other aspects of the project achieved by the private sector. Parker and Hartley (2003) stressed that this argument has been echoed by numerous academics and, indeed, governments. The HM Treasury Committee (2011) argued that government has always been able to obtain cheaper funding than private providers of project finance and that the cost of capital of PPPs was currently double that of government gilts. However, Grout (1997) and Jenkinson (2003) argue that, in theory, private sector borrowing costs should not always be higher than public sector costs, where the latter are properly calculated. This builds on Modigliani and Miller's (1958) proposition that the overall cost of capital is invariant to the method of financing, including whether it is funded by public or private finance. Grimsey and Lewis (2007) argued that the overall underlying risk of the project determine the cost of capital. While this risk is captured in the returns required by the private sector, it is not captured in the government's cost of borrowing as measured by real interest rates on government debt.

Jenkinson (2003) established that there is always equity in any financing structure although it is not always easy to spot it. In the case where finance is provided via the public sector, Leach, (2010) notes that the equity is essentially provided by taxpayers in general and/or the customer debt raised on the back of a government guarantee is, in the case of major economies, essentially risk free and non-hypothecated; governments will not refuse to pay the interest and principle if a particular public service cannot cover its costs. The only remaining ways of absorbing such risks are to inject funds from general taxation and/or increase user charges. In either case, the risks that cause the loss are real and are being borne by some, or all, taxpayers (Jenkinson (2003)).

According to Grimsey and Lewis (2007), the argument that public sector finance is cheaper because government borrowing costs are lower than the private sector cost of capital has thus been challenged, on the basis that it does not account for the (equity) risks borne by taxpayers. Specifically, equity risk is borne by taxpayers in the sense that if the publicly provided service does not cover its costs, the gap will be funded through higher charges or the use of general taxes. However, that is not to say the costs of public and private finance are

the same in all instances. As Jenkinson (2003) acknowledges, the costs of financing a particular project will be the same for public and private finance only if ‘contracts are easy to define, risks are well understood, transaction costs are low, and competition to provide finance is active.

Under certain situations as Jenkinson (2003) alluded, it may be the case that the cost of financing under PPPs is higher than under public provision. For example, misallocating risks associated with various aspects of the project may lead to a higher cost of capital under PPPs relative to public provision. This relates to the fundamental idea in financial theory that risks should be transferred to the party that is best able to manage it. Hence, if too much risk is passed on to the private sector via PPPs, investors would require a higher return in order to compensate for it (UK, the Treasury Select Committee 2011).

Indeed, Gao and Handley-Schachler (2004), elaborate that a feature of PPP contracts in practice has been that the public sector has looked to push as much risk as possible on to the private sector, regardless of which party is best able to manage that risk. This has seemingly stemmed from reluctance within some public agencies to take on risks/costs, even where they have been best placed to do so. The effect of inappropriately passing risk to the private sector is that it pushes up the cost of capital, and hence the overall cost of the project. In the UK, the Treasury Select Committee (2011) has highlighted the negative impact this had on PPP outcomes. The House of Commons Treasury Committee (2011), argued that allocating risk to the private sector is only worthwhile if it is better able to manage the risk and can pass on any subsequent savings to the client. Gao and Handley-Schachler (2004) view that although there is nothing in theory per se that would imply a higher cost of financing for private sector provision of infrastructure investment, inappropriate allocation of risk and many other factors may mean a higher cost of capital when investment is undertaken by the private sector relative to the public sector.

2.3.3.2 Advantages of Public-Private Partnerships

According to Gannon and Smith (2009), the advantages of PPPs are summarised as follows:

Box 3: Advantages of Public-Private Partnerships

<p>Value for Money- The most important advantage of a PPP is the creation of value for money. This means delivery a project with the same quality as under conventional procurement for</p>

less money, or delivery a project with a superior quality for the same amount of money. The most predominant value for money drivers are risk transfer, output based specification, long-term nature of contracts, performance measurement and incentives, private sector management skills and competition.

Cost efficiencies - PPPs can lead to cost efficiencies, which are the results of increased competition, an improved proportion of risk transfer, closer integration of the different aspects of a project, better whole life costing and improved innovation. Significant cost savings can be obtained in the long run by integrating capital investment and the delivery of services (i.e. servicing the asset), because maintenance will be considered when the asset is designed to maximise efficiency.

Time-to-delivery savings - PPPs can also lead to time-to-delivery savings, caused by a greater private incentive to generate revenue as soon as possible and the increasing experience with PPPs. Another reason for these time-to-delivery savings is the existence of a learning curve for all parties involved. The private sector is driven by profit motives and is accountable to shareholders to ensure that the profit is not diminished by higher interest charges and revenue losses from delays in the project completion. In public sector, project completion delays might not have the same perceived direct financial impacts.

Reduction on the public treasury – Public Private Partnerships help reduce the capital demands on the public treasury for infrastructure development. PPPs will give the government more freedom to spend on the non-infrastructure investments in the short term.

Improved response to market forces – In case of user-fees, an improved response to market forces will be created, resulting in greater efficiency. Traditionally, transportation facilities are publicly funded. While users do pay for the facilities they use, price signals are not available to guide demand or supply. These improvements in incentives to market forces are the improved profit margins, the long term business, the whole life costing, the payment for performance and the merging of design, build, finance and operation.

Source: Gannon and Smith, 2009 (Association of European Transport)

2.3.3.3 Disadvantages of Public-Private Partnerships

In addition to cost of PPPs mentioned above, below are some of the disadvantages of PPPs:

Box 4: Disadvantages of Public-Private Partnerships

Poor Value for Money – The most important advantage of a PPP is the creation of value for money. However, the value for money in PPP arrangement is usually eroded by higher transaction and capital cost.

Insecurity – Whenever two or more parties enter into a contract, there is a risk that the administrative efforts on each side will be frustrated by a lack of co-operation on the part of the other party. Also, when a party enters into the tender procedure, the party may not even be granted the concession. Because of these insecurities, the number of bidders may be limited and thereby reducing the competitiveness of the tender process.

Inefficiencies – Long term operating contracts can lead to value for money. However, they can also lead to inefficiencies due to a lack of contestability and competition. The tender procedure at the beginning of the process may have introduced competition, the developer who has signed the contracts will have the exclusive rights to an infrastructure facility, therefore practically enjoying a monopoly. During the operation phase inefficiencies may be created due to lack of contestability and competition.

Culture gap – there exists a cultural gap between the private and the public actors, which may result in loss of confidence in each other. The private sector's motive to take part in a public private partnership is primarily profit making or image building while the public sector's motive is merely social attractiveness. The cultural gap can lead to an unfair and unrealistic cost comparison procedures can contribute to slow implementation or even failure of PPPs, thereby raising transaction costs.

Source: Gannon and Smith, 2009 (Association of European Transport)

2.3.4. The Regulated Asset Base (RAB) Model

Meaney and Hope (2012) pointed out that the regulated asset base is a familiar concept in regulated utilities. It is an accounting number mainly used by economic regulators in the calculation of allowed returns. The RAB represents the regulated company's past investments, comprising what investors paid when the assets were originally privatised, plus the completed efficient capital expenditure since then, adjusted for depreciation. Thus, at any given time, the RAB refers to the cumulative historical investment made by the company, net of cash recovered from regulatory depreciation. It is also usually indexed to a measure of price inflation in order to allow for the effects of inflation on the regulated company's capital stock over time.

Under the RAB model, investors are allowed to earn revenues which cover three elements. An allowance for the depreciation of the RAB over time, calculated according to established regulatory techniques. Depreciation is calculated with reference to asset lives and can be straight line, front loaded or back loaded according to the preference for the recovery of sunk costs over time. The choice of depreciation profile is Net Present Value neutral, but can be altered to reflect the allocation of risk between the company and customers, intergenerational equity, and efficient capacity utilisation (Helm, 2009).

A return to investors based on the value of the RAB i.e. a return on capital invested is typically calculated by multiplying the RAB by a Weighted Average Cost of Capital (WACC) that is an average of the cost of equity and the cost of debt. The WACC is intended to reflect the opportunity cost of the investments made by the investor. The forecast level of Operating Expenditure (OPEX) associated with the day-to-day operation of the network. These are compensated on a pay as you go basis. According to Helm (2009), the RAB model has the potential to solve the underinvestment problem in infrastructure largely resulting from the time inconsistency problem.

2.3.5. User Charging

Basso and Duvall (2012) highlighted that user charging applies for new roads where direct road user charging has not been previously used other than one toll road duplication. For some government services, a fee is charged to the user of the service. The fee might recover all or part of the costs incurred in providing the service. User charging has two purposes; firstly, it creates a signal to the user about the costs involved and so promotes the appropriate use of the service. Economists generally refer to this as promoting ‘allocative efficiency’ (Pickford and Blythe, 2006).

Secondly, it is seen as equitable because those people who do not directly benefit from the service also do not fund or at least only partially fund the provision of the service. In order to facilitate a ‘fee for service’ approach to charging, the service must be excludable. It is possible to exclude people from consuming the goods and services. User charges are commonly used to fund completely or partially public transport, through the use of fares. It can be seen that public transport exhibits the features set out above namely, people can be refused entry to the bus if they do not pay the fare. Road investment can also be funded from user charges such as registration and annual licencing fees, road user charges, and fuel excise duty (Bonsall and Kelly, 2005).

2.3.6. Public Sector Subordinated Funds

It is undeniable that demand risk financial models, if these are even considered, would be much more conservative. The heady days of complex financial engineering are gone, with lower gearing and downside scenarios dominating bankers’ mindsets. As such, for certain projects there may now be more scope for upside performance through future financial restructuring, when the riskier build and ramp-up phases are completed (depending on how conservative initial usage forecasts were). Once revenue has stabilised and construction risk is overcome, infrastructure projects, such as toll roads or ports, typically present stable cash flows with relatively lower risk (Office of the Economic Development Board, 2012).

Government can fill important gaps in the financial structure through providing subordinated loans between senior loans and equity. These government loans can then be repaid if the project performs as expected with revenues in line with base case forecasts, rather than the downside case. Subordinated loans give the government the right to receive a share of on-going revenues as interest on the loans, subject to a cash flow ‘waterfall’ designed to safeguard senior lenders’ debt service. Moreover, there is the real prospect of early

repayment of the subordinated loans if a favourable refinancing of the asset can be completed once it is operationally stable and generating surplus net cash flows (PWC, 2011).

Subordinated loans are repaid after debt service on senior loans but before returns to equity holders. Upside returns can be generated through revenues exceeding base case through real patronage increases, higher CPI escalation or cost savings and/or through refinancing parameters exceeding base case assumptions. The model would need to include mechanisms for government to share in these returns either through accelerated repayment mechanisms or separate upside sharing arrangements. The timeframe for repayment of the subordinated debt to the government would need to be structured as medium to longer term, with repayments occurring at the back end of the concession so as to be consistent with the priority given to senior debt. This will commit government to long term investment but early potential for recycling of capital exists under favourable refinancing scenarios (Fitch, 2011).

The OECD (2010) highlighted that one of the challenges for use of public sector subordinated notes is resolving the inter-creditor issues between the government and the senior debt providers. The government is playing two roles, as lender and procurer. In particular, the government will face restrictions on exercising typical creditor rights that would force termination. Depending on the portion of private finance to government-issued subordinated notes, the majority of the project risks could be transferred to the private sector. However, the government would share proportionately in all project risks.

According to Sorge (2004), the main challenge of using public sector subordinates funds for infrastructural development is that of matching the supply of finance from the private sector with investable projects. The potential supply of long-term financing is ample. Pension funds, insurance companies and other long-term institutional investors have very large and growing long-term liabilities. Hence they need long-term assets. But very little of their financial resources is allocated to infrastructure. In addition, the vast financing potential of international capital markets remains largely untapped.

2.3.7. Infrastructure Bonds

Engel, Fischer and Galetovic, (2010) submitted that infrastructure bonds have had a chequered history in Australia, with the previous scheme introduced in the 1990s ultimately being abandoned as a result of concerns over unintended tax outcomes for the

Commonwealth. However, infrastructure bonds have re-emerged as a potential funding mechanism. The common objective of creating a market for infrastructure bonds has focused on leveraging private investment through the provision of incentives to invest, thereby removing some of the barriers. Two specific approaches are possible:

- Create a tax incentive by allowing interest on infrastructure bonds to be tax deductible for issuers but tax exempt for investors.
- Provide some form of credit enhancement through the provision of government guarantees.

2.3.8. Tax Increment Financing

According to Briffault (2010) cited in Kerth (2011) highlighted that Tax Increment Financing (TIF) is a model of investment which is well established in the United States and which has recently started to gain traction in the United Kingdom (UK). The model uses the revenue generated by infrastructure development, specifically an increase in local or state taxes due to increase in property values, to repay loans used to fund new infrastructure.

The security related to ring-fenced funding has allowed infrastructure projects to be delivered, which would otherwise have been delayed or would not have proceeded. For example, through changes in legislation, local councils may be permitted to borrow via TIF schemes and in doing so may access incremental finance based on securitising future rates increases (Kerth, 2011)

TIF has predominantly been used to facilitate councils (in the UK) and municipalities (in the US) investing in urban regeneration projects. There is significant potential to facilitate much needed investment in Australia's urban infrastructure through TIF (Kerth, 2011).

However, the scope of TIF could be extended to transport and economic infrastructure projects procured at State level. Railway and road extensions (similar to the Northern Line extension in London) could be financed through TIF. The success of this application lies in creating an effective link between the cost of infrastructure provision and those who benefit from it (Briffault, 2010).

2.3.9. Public Sector Minimum Guarantees

Under this model, the government would provide minimum patronage or revenue guarantees for a defined period. The government support would be a contingent guarantee, with the expectation that it would not be triggered unless an adverse outcome emerged. The guarantee would cover debt service, but not necessarily equity. Ideally, the guarantee would fall away once certain revenue thresholds have been met. Depending on the accuracy of the forecasts to which the guarantee relates the guarantee could fall away as early as three to four years after the new infrastructure has been opened (PWC, 2011).

A minimum patronage or revenue guarantee is provided, under which concessionaires are compensated when patronage or revenue falls below an annual threshold. The minimum patronage or revenue threshold could be set below (e.g. 10% – 30%) the expected base forecasts in order to reduce government exposure, while providing sufficient coverage to protect debt capital. Patronage and revenue guarantees retain the private sector's financial incentive in the project, provided the minimum guaranteed revenue stream does not provide for a full return on equity. In return, the concessionaire enters into a revenue sharing agreement in which it shares a percentage of revenue with the government once a threshold is exceeded. The government's share of the upside can be utilised to fund other infrastructure projects (PWC, 2011).

The approach of bidding patronage forecasts has been largely discredited by the subsequent financial failures, with broader implications for market appetite for demand risk on Greenfield projects in other sectors. A new approach, linked to the notion of government guarantees, would be for government to nominate a band of projected revenue in the formal request for proposals, thus containing or removing the traffic forecast bidding parameter. The majority of the project risks will be transferred to the private sector. However, the government would retain an exposure to demand risk for the project until such time as the guarantee falls away (World Bank, 2007).

2.4. Funding Models in New Zealand, Germany, Australia, Kenya South Africa and Zimbabwe

2.4.1. Funding Models in New Zealand

Transport infrastructure in New Zealand is currently funded mainly from a mixture of user charges, general government revenue and charges to land owners and developers. Since

2008, New Zealand central government revenue from the consolidated fund has no longer formed part of the National Land Transport Fund (NLTF). However, some specific land transport projects and activities are funded by central government through annual Crown appropriations rather than through the NLTF – most notably, this includes rail capital investments, which are funded through direct central government appropriation (Government of New Zealand, 2012)

In New Zealand the NLTF is a fully hypothecated or dedicated fund for land transport infrastructure investment from fuel excise duty (petrol tax) and road user charges and licencing fees. According to NZCID (2011), the NLTF can be considered as funding from user charges, since the fuel excise duty, registration and licensing fees and road user charges are directly hypothecated into the NLTF. The NLTF is managed by the New Zealand Transport Agency (NZTA) through the National Land Transport Programme (NLTP). The NLTP has a number of ‘activity classes’ defined by the Government Policy Statement on Land Transport Funding (GPS). These set out the specific amounts that are required to be spent on each activity, such as renewal of local roads. The activity classes include new and improved infrastructure for state highways; renewal of state highways; maintenance and operation of state highways; new and improved infrastructure for local roads; renewal of local roads; maintenance and operation of local roads; road policing; public transport infrastructure; public transport services; road safety promotion; walking and cycling; sector training and research and transport planning.

For the NLTF, the government applies the principle that revenue raised from road users should be spent on the road system as well as funding other activities that benefit road users. It is noted that public acceptance for the use of ‘user pays’ approaches for funding transport has increased since the fuel excise has been fully hypothecated (NZCID 2011). Conversely, James and Date (2007) reported that the central government has been less willing to provide additional crown funding to transport given that there is a fully hypothecated land transport fund. Internationally, ‘alternative’ user charges such as road tolls, congestion charges and High Occupancy Toll (HOT) lanes are increasingly being used to fund transport investment. This reflects the observation that road infrastructure has many ‘private good’ characteristics. Toll roads are common in Australia and have also been introduced in New Zealand for example the Northern Gateway north of Auckland opened in 2009 (NZCID, 2011). Tolls and congestion charges are currently being or have been considered in a number of contexts in New Zealand ,including in previous NZTA research reports, reports by the Ministry of

Transport into road pricing in Auckland, and the Auckland Spatial Plan. For example, previous research reports for the NZTA examined road user and congestion charging (Booz, Allen and Hamilton; 2006).

Moreover, the Ministry of Transport investigated the introduction of various congestion charging mechanisms for Auckland in both 2006 and 2008. Notably, the potential introduction of tolls and congestion charges has also arisen recently in the context of the Auckland Plan (Auckland Council 2011)

2.4.2. Australia

The law of library congress (2014) reported that in 1959, the government of Australia announced the termination of the hypothecation arrangements for road funding. The policy of funding road infrastructure from general revenue rather than earmarked funds continued until 1982, when the Australian Bicentennial Road Development Trust Fund Act was enacted, establishing a road development program funded by a surcharge of AU\$0.01 per liter (later AU\$0.02 per liter) on the excise of petrol and diesel. The program was replaced by the Australian Land Transport Development Act (1988), which abolished the surcharge and allowed the government to determine what share of excise on petrol and diesel should be paid into a trust fund for the purpose of funding road projects under the Act. Although this Act is still in force, since the 1991–92 fiscal year successive Governments have set road funding in the budget process, discontinuing the practice of hypothecating a proportion of fuel excise to roads (Fuel taxation inquiry supra note 3).

2.4.2.1 Current Federal Funding Models

Under the current road funding arrangements at the federal level, revenue from the fuel excise tax and other road transport-related federal taxes or charges is added to the general revenue pool (the Consolidated Revenue Fund (The Commonwealth's Appropriation Framework, 2014) and is not earmarked or placed in designated funds for road (or other transport) infrastructure projects. The Richard Webb, Petrol and Diesel Excises (2000)

reported that federal expenditure related to road infrastructure is therefore funded by appropriations as part of the annual budget process. This includes payments to states and territories for road infrastructure projects that come under the Nation Building Program, which is part of the National Partnership Payments to the States distribution system agreed upon between the federal and state governments. Funding under this program is appropriated through a special account appropriation mechanism authorised by the Nation building Funds Act 2008. Allocations under the relevant fund are guided by an infrastructure priority list developed by Infrastructure Australia (Morrison and Cormann, 2015). The following are some of the major funding programs specifically related to road infrastructure that are administered by the Department of Infrastructure and Regional Development as part of its broader “Infrastructure Investment” program (DIRD, 2013) .

i. National Projects

DIRD (2013) reported that national projects targets projects on the National Network that will deliver the highest benefits to the nation. It involves the distribution of funds to individual states for major road works that will significantly improve the efficiency and safety of the National Network (DIRD, 2013).

ii. Off-Network Projects

Under this program, funds are provided to state, territory, and local governments for road projects not on the National Network (DIRD, 2013).

iii. Roads to Recovery Program

DIRD (2012) reported that roads to recovery programs involves the allocation and direct payment of funds to local authorities in each state and territory to support the maintenance of the nation’s local road infrastructure asset (DIRD, 2014). Each council is guaranteed a share of the available funding and nominates projects to be funded. Funding is then distributed according to a formula based on population and road length set by the Local Government Grants Commissions in each state and the Northern Territory General Conditions apply related to expenditure of payments under the program as well as planning and reporting.

iv. Funding for Local Roads

Unlike the Roads to Recovery program, this program provides untied local road grants to councils as part of annual financial assistance grants. According to the DIRD (2013), the local road grants program reflects the following features:

- The amount provided is increased annually to compensate for both population growth and inflation.
- Each State receives a fixed share of the grant; the share being set out in legislation.
- Each council's share of the grant is determined by the State's local government grants commission.
- The grants are untied South Australian councils also receive supplementary funding for local roads in addition to their financial assistance grants.

v. Black Spot Program

According to DIRD (2013) projects funded under this program include various measures aimed at addressing issues at road locations where many accidents are occurring. Individuals and organisations are able to nominate a "black spot" for funding consideration, and these are assessed by the relevant state authority and state "Consultative Panels" before being submitted to the federal government. In order to be eligible for funds, project proposals must include information on whether there have been a minimum number of casualty crashes at the road or site and should be able to demonstrate a benefit to cost ratio of at least 2:1.

2.4.3. Germany

Germany differentiates between federal, state, and municipal roads and highways. Federal highways consist of the long-distance interstate highways (Autobahnen), major divided four-lane highways that connect to the interstate system, and some thoroughfares through local communities (Federal Long-Distance Highway Act). Uerpman-Witzach (2006) suggested that most other highways and roads belong to the states, except for the road systems of major municipalities, for which these municipalities are responsible. The Basic Law Art (90) states that the federation is responsible for maintaining and constructing federal highways. The

states, on the other hand, have the responsibility of administering the federal highways within their territory, a task that they carry out under the supervision of the federation. Bundeshaushaltsplan (2013) commented that this administrative responsibility includes setting up and maintaining the agencies that administer federal highway construction and maintenance.

In accordance with the constitutional principle, The Basic Law Art (104) states that each governmental body finances the expenditures for which it is responsible; the federation bears the burden of financing the construction and maintenance of federal highways. The states, on the other hand, are responsible for financing the administrative activities that relate to the federal highways and also for all expenditures connected to state highways and roads.

According to Palmer (2014), in the German fiscal system, revenue is generated primarily through taxes imposed through federal law. The revenue from some of these taxes is either allocated exclusively to the federation, the states, or the municipalities, or is shared between these entities. In particular, individual and corporate income tax and value-added tax revenues are shared.

2.4.3.1. Funding for National Road Infrastructure

Germany does not have a dedicated fund for building and maintaining highways. The annual federal budget, however, has a highway construction plan that describes ongoing and planned construction projects, and lists the revenues achieved by the federation that are tied to highway construction and maintenance. The Basic Law Art (106) states that the most important of the tied revenues is the toll imposed on truck traffic on federal highways; in addition, there is some miscellaneous income, such as fees and concessions. The remainder of the needed funds for federal highway construction and maintenance comes from general revenue.

Germany taxes gasoline consumption within the framework of an energy tax, and the operation of motor vehicles through a motor vehicle tax (Energy Tax Act, 1534). The revenue from both these taxes belongs to the federation. In popular opinion, these taxes serve to finance highway construction and maintenance, yet there is no legal requirement for limiting their use to these purposes. Until 2006 gasoline consumption was taxed through a mineral oil tax, and part of the proceeds from this tax were tied to federal highway

construction and maintenance. The mineral oil tax was repealed in 2006 with the enactment of the Energy Tax Act, and the revenue from the latter is not tied to highway construction.

2.4.4. Kenya

2.4.4.1. Annuity road funding model

The World highways (April 2015) reported that Kenya has unveiled a new financing model for road construction and reviewed its design standards and construction methodologies, which forms part of a new strategy for the East African country. Under this new plan Kenya is planning to upgrade 10,000km of road, with these links featuring asphalt surfacing; the work being carried out over the next five years at a cost of US\$2.8 billion. Despite the country grappling with a backlog of road maintenance works requiring \$4.3 billion, the Kenyan Government has moved ahead with the new plan, commonly called the Annuity financing programme. This will nearly double the number of Kenya's asphalt surfaced roads from the current 14,000km, to 24000km by 2017.

Kenyatta when he launched the ambitious road project in the capital Nairobi stated that Kenya has taken 50 years to surface the 14,000km of road, or an estimated 242km/year, because of low investment in the road sector, corruption in government, lethargy among State officers and insistence on outdated national development models.

The government hopes the project will enable Kenya to transform itself into a low-cost investment and trading destination. This will also support the projected economic growth, which is expected to expand by 6.9% this year, up from an initial growth forecast of 6.5% according to a policy statement by Treasury in January.

According to KeNHA (2015) Kenya is adopting a novel funding method to redevelop its road network. The build-operate transfer model is being favoured by the Kenyan Government. New access roads and interchanges will connect major highways to towns and cities. The new 10,000km of asphalt surfaced roads will promote national integration and improve security because of connectivity of regions and communities according to the Kenya National Highways Authority.

In urban areas, the Annuity programme is expected to reduce traffic congestion and pollution, particularly in capital Nairobi where the government estimates that traffic jams cost

\$578,000/day in lost productivity. The new plan will create more arteries into and out of the cities and towns and reduce commute times. To achieve the road plan objectives within the stipulated time and also deliver quality work, KeNHA (2015) is proposing a major shift from the conventional road development financing models and conservative road designs. According to KeNHA (2015) these have been a major constraint in the country's development for the past 50 years.

KeNHA (2015) alluded that the lack of innovative financing models and the insistence on using traditional construction techniques has locked up private investments that could have catalysed road sector growth. The Annuity programme and conventional public-private partnerships are some of the models that could translate the 10,000km road pavement plan into a successful case.

Under the Annuity programme, contractors are being encouraged to design, finance, construct and maintain roads based on agreed periodical payments by the government. The payments are extended after the construction of the project, which KeNHA (2015) says is the best option for roads which are not viable for the conformist tolling public-private partnerships. KeNHA (2015) further reported that innovative public-private partnerships allow the private sector, to finance, design, construct, maintain and operate the road and recover initial investment through toll proceeds.

The Kenya Private Sector Alliance KEPSA (2015) which includes road contractors and engineers in its rank of members says the Annuity financing model has been tried in road construction in other countries with success. According to KEPSA (2015), Kenya has chosen to implement the model close to the one adopted in India. This model's effectiveness and success in India erases all doubts to its workability in Kenya. This framework involves the formation of special purpose vehicles or consortiums consisting of consulting engineers, contractors, financiers, and project managers to implement road projects.

The World Highways (April 2015) reported that rural areas in Kenya will benefit from better transport connections. Kenya's major cities and towns will have much wider roads which are able to carry greater traffic volumes. In some areas labour-intensive methods are being used to help maintain and improve road connections. Asphalt road links will improve access and help with the country's important tourist trade. A significant portion of the road improvement programme is already underway, developing multilane links.

Despite 90% of Kenya's cargo and passenger traffic relying on road transport, the sector has heavily depended upon financing from the direct exchequer and proceeds from the Roads Maintenance Levy Fund (RMLF). The latter is a tax on fuel charged at \$0.03/litre. This funding stream is used to build new roads and maintain existing links. The road sector requires \$44 million/year for the next 10 years to meet its targets for maintenance and new road development.

According to the Infrastructure and Transport Ministry (2014), the Annuity plan has been introduced to help the road sector surmount this financing constraint. Under the Annuity financing model, The Infrastructure and Transport Ministry (2015) commented that the consultants and contractors will design and construct the roads while financing is done by bankers with guarantees from the government. The model will increase business between commercial banks, contractors and the government. Insurance companies will insure the works while performance guarantees will be provided by the banks as usual.

The Kenya Board (2015) also proposed public-private partnerships can be turned into more innovative schemes by introducing road concessioning, promoting build-operate-transfer models and also the fund-rehabilitate-maintain-transfer scheme.

2.4.5. South Africa

The current South African Constitution established a three-tier system of government i.e. national, provincial, and local (South African Constitution Act 40(1) (1996). The national and provincial governments enjoy concurrent legislative jurisdiction over matters relating to public transport and the regulation of road traffic. Provincial governments enjoy exclusive legislative jurisdiction over matters affecting provincial roads and traffic. However, in special circumstances, the national government may legislate on matters exclusively reserved for provincial governments, including those affecting provincial roads and traffic. Dendy (2009) concluded that there are a number of national and provincial laws regulating roads and road transport in South Africa.

2.4.5.1. Funding of National Roads

The South African National Roads Agency SOC Limited and National Roads Act envisages various sources of funding for SANRAL, including:

1. National Treasury/Government Appropriations-- Non Toll Roads
2. Concessions (Public-Private Partnerships)-South African Road Concessionaires (SAARC)
3. Capital Market Borrowings
4. Direct Foreign Investment and loans backed by Export Credit Agency
5. Bank loans

Currently, SANRAL operates two separate business areas (toll and non-toll operations). The reports on and budgets for each are kept strictly separate for purposes of management and cash flow obligations; “no cross-subsidization between the two are permitted (Modes of Financing, 2014).

2.4.5.2. National Treasury/Government Appropriations - Non Toll Roads

Most of South Africa’s national road network falls into the category of non-toll roads and is largely funded through appropriations. At present, SANRAL manages a road network of 19,705 kilometres (about 12,244 miles), including both toll and non-toll roads throughout South Africa. According to SANRAL, Annual Report (2013), most of these (81%) consist of non-toll roads. The SANRAL, Strategic Plan 2012/2015 reported that the vast majority of the funding for non-toll roads comes from tax-based revenues generated by the national government and disbursed through appropriations; in 2012/2013, this amounted to ZAR9.7 billion (about US\$875 million). SANRAL Operating summary (2012) stated that a small portion of the funding is generated from other income; in the same year this amounted to ZAR355 million (about US\$32 million). According to SANRAL, Strategic Plan (2010) of the total non-toll budget for the year, ZAR466 million (about US\$42 million) was allocated for routine road maintenance contracts.

2.4.5.3. Concessions (Public-Private Partnership)-South African Road Concessionaires (SAARC)

In addition to the 81% of non-toll roads and about 11% toll roads under SANRAL’s direct management, 8% of South Africa’s national roads, which are also toll roads, are developed and managed by private parties through concession contracts under Public-Private

Partnerships. The concessionaires get a thirty-year term to build the roads, collect tolls, and manage them in accordance with the terms of their contracts; at the conclusion of the concession, they turn the roads over to SANRAL. The roads under concession remain the property of SANRAL, and all improvements made by the private investors are reflected on SANRAL's balance sheet as assets (SANRAL, 2014).

The most popular and famous South African Road concessionaires are as follows;

The N3 Toll Route between Heidelberg in Gauteng and Cedara in Kwa-Zulu Natal is a Public Private Partnership between N3 Toll Concession (N3TC) and the South African National Roads Agency SOC Ltd (SANRAL). SANRAL and N3TC entered into a Concession Contract in 1999, which gave N3TC the responsibility to design, construct, finance, operate and maintain the N3 Toll Route for a period of 30 years. The N3 Toll Route covers a distance of 415km, traversing four provinces, and is South Africa's key economic and tourism arterial linking the port of Durban with the economic hub of Johannesburg.

Bakwena

Bakwena holds a 30-year Concession Contract with the South African National Roads Agency SOC Limited (SANRAL) to design, build, finance, operate and maintain 385km of road. The N1N4 toll route covers the N1 from Pretoria to Bela-Bela in Limpopo and the N4 from Pretoria through Rustenburg to the Botswana border. To effectively manage traffic and minimise delays on the N1N4 toll road, Bakwena was the first toll road company in South Africa to introduce a combination of Electronic Toll Collection (ETC) and conventional manual tolling. The Bakwena N1N4 Toll road is operated and maintained by Pt Operational Services (Pty) Ltd.

Trans African Concessions (TRAC)

Trans African Concessions (TRAC) is a privately owned international company which was established in 1997 to manage the section of the N4 between Tshwane in Gauteng and Maputo in Mozambique, known as the Maputo Development Corridor. TRAC was the first private company to secure a private public toll concession contract with both the South African and Mozambican governments and is also the only concessionaire to operate Africa's sole cross-border route. TRAC is responsible for the 570km of road between Solomon Mahlangu off-ramp in Tshwane and the Port of Maputo in Mozambique and operates six toll

plazas (four in South Africa and two in Mozambique). The Concession Contract, which is valid until 2028, requires TRAC to meet numerous obligations including the design, construction, expansion and rehabilitation of the N4 Toll Route. The concessionaire now also operates Load Control Centres (LCC) on the route in a bid to curb overloading. It currently has five permanent LCC's in South Africa and two in Mozambique as well as 11 temporary ones.

2.4.5.4. Capital Market Borrowings

SANRAL 2014 annual report, postulated that toll roads are funded either through Public Private Partnerships or Capital market borrowings. In South Africa, capital market borrowing are generated by auctioning government guaranteed and non-guaranteed bonds. It is important to note that funding through PPPs or capital market borrowings is usually done at the initial stage of asset construction. In subsequent years, the collection from the tolls, enables the development and maintenance of roads using the “user-pay” principle.

Government Guarantee Bonds -SANRAL-Funded Toll Roads

According to SANRAL Strategic Plan (2010), SANRAL has directly developed and manages about 11% of the over 19,000 kilometres of national roads, which it funds largely through a mix of toll revenues and capital market borrowing. In raising funds for toll roads, SANRAL seeks to follow two key principles: reducing the cost of borrowing and tying the maturity of the funding to the life of the roads. SANRAL Strategic Plan (2010) indicated that one of the principal ways SANRAL raises funds to finance toll roads is by issuing government backed bonds. The Plan further outlined that it has a government guarantee on borrowing of ZAR6 billion (about US\$547 million) with no expiration date (SANRAL and National Roads Act 33) and a further guarantee of ZAR31.91 billion (about US\$2.9 billion) under a Domestic Medium Term Note Programme (DMTN) was provided by the government. This helps SANRAL keep the cost of borrowing low. The country's National Treasury has approved for SANRAL a borrowing ceiling of ZAR47.91 billion (about US\$4.3 billion); ZAR37.9 billion (about US\$3.4 billion) of this amount will be underwritten by the national government through a guarantee.

Non- Guaranteed Bonds

SANRAL, ANNUAL REPORT, (2012) reported that SANRAL may also issue non-guaranteed bonds for the purpose of accessing additional sources of funding. It is authorized to raise funds through the issuance of non-guaranteed bonds of up to ZAR15 billion (about US\$1.35 billion).

The 2014 Annual report by SANRAL revealed that the South African government had approved an unguaranteed borrowing capacity of up to a nominal value of R15 billion as at 31 March 2014 (R15 billion as at 31 March 2013). SANRAL issued a nominal of R13.38 billion as at 31 March 2014 (R13.54 billion as at 31 March 2013) under non-guaranteed DMTN programme (National Roads agency bonds). The funds raised through these borrowings can only be used for toll operations.

To strengthen SANRAL's ability to attract funds for its toll portfolio and instil confidence in the investor community, SANRAL has obtained credit ratings, from Moody's, an independent international rating agency since March 2007. The credit rating enables SANRAL to raise non-guaranteed and guaranteed debt competitively, thus further releasing tax-based revenues to meet other pressing demands. On 27 June 2014, Moody's announced that SANRAL's outlook changed from "negative" to "stable". This rating is based on the intrinsic financial strength of the entity (SANRAL Annual Report, 2014).

Toll Roads-Background Information

Toll roads are a relatively recent phenomenon in South Africa. Government appropriations were the only source of funding for roads in the country until 1995, when toll roads were introduced to compensate for inadequate government funding for the development, management, and maintenance of national roads (Strategic vision of SANRAL, 2010) . Currently, 19% of South Africa's national road network consists of toll roads. The SANRAL Strategic Plan (2010) held that total budget for toll-road development and management for 2012/2013 was ZAR4.7 billion (about US\$424 million), including ZAR293 million (about US\$26 million) allocated for full-time routine road maintenance. SANRAL is authorized by law to determine which national roads should be turned into toll roads. SANRAL may, with the approval of the Minister of Finance, declare "any specified national road or any specified portion thereof, including any bridge or tunnel on a national road, to be a toll road (SANRAL and National roads Act 27). However, in the Act the Minister determines the amount of the toll that may be imposed as well as any increase or decrease in such fees. Toll roads in South Africa are developed in one of two ways: SANRAL may fund the development of a toll road

and directly collect tolls, or contract the management aspect to a private company. It may also enter into a contract with any person to finance, plan, design, construct, maintain, or rehabilitate a national road and operate it as a toll road.

2.4.5.5. Direct Foreign Investment and loans backed by Export Credit Agency

According to SANRAL Annual Report (2012), in addition to bonds, SANRAL has also explored and made limited use of additional sources to fund its toll-road program. One such source is direct foreign investment. In 2010/2011, SANRAL obtained a government-guaranteed, twenty-year loan from the European Investment Bank in the amount of ZAR1.1 billion (about US\$99 million). SANRAL has also explored Export Credit Agency (ECA) supported loans. Recently, SANRAL was able to obtain an Austrian ECA guaranteed line of credit from a local South African bank for ZAR550 billion (about US\$49 million) at a favourable rate for the purchase of goods and services to finance a particular toll road.

2.4.5.6. Bank Loans

The SANRAL 2013/2017 strategic plan indicated that bank loans can be used to fund road infrastructure development. This option will be explored, but would be limited by the approved bank lines as well as the borrowing cost. SANRAL will use this instrument if and when it is deemed to be competitively priced. Unless the borrowing cost can compete with the DMTN programme, this option will not be utilized.

2.4.6. Infrastructure Funding Models in Zimbabwe

Zimbabwe Scoping Report (2015) held that the infrastructure set up in Zimbabwe is quite unique compared to other African countries in that Zimbabwe has been described as having the characteristic of both a ‘middle income country’ and ‘a fragile state. The basic infrastructure at most is in place and largely needs rehabilitation. Zimbabwe’s infrastructure has disintegrated significantly due to a period of hyperinflation and economic regression (ZEPARU, 2015)

According to African Development Bank AFDB (2015) the funding that Zimbabwe requires rehabilitating its dilapidated infrastructure has surged from previous estimates of US\$14 billion to a massive US\$20 billion.

The AFDB survey (2015), established that in order to create a seamless infrastructure network with the capacity to drive economic recovery, Harare would have to invest at least US\$2 billion per annum in the next decade on Zimbabwe's infrastructure requirements estimated that about US\$14 billion was needed to repair potholed roads, damaged dams, bridges, schools, hospitals and crumbling power infrastructure in order to lift the country out of a painful downturn.

The additional US\$6 billion has emerged after allocations to key capital expenditure projects have virtually run out as the country battles a liquidity crisis that has battered revenues to Treasury coffers.

Apart from the US\$206 million trunk road project undertaken by Group Five in the past two years, the country has not been able to carry out most projects since dollarisation in 2009.

Positive signs of economic recovery from a decade of hyperinflation that ended in 2009 have been overturned by a ruthless downturn that has crippled State finances and grounded Harare's ability to fund growth stimulating capital projects. The financial Gazette (June 2015) remarked that it is infrastructure that has underpinned recovery and growth in many African countries, including South Africa. According to AFDB (2015) raising the country's infrastructure levels to the best in Africa, the country can add 2, 2 percent to its Gross Domestic Product (GDP). Zimbabwe would need to invest at least US\$2 billion a year for the next 10 years. Financial Gazette (June 2015) stated that the extent of the deterioration in infrastructure has been shocking for cash-strapped Zimbabwe, whose annual revenues is about US\$3,6 billion, 80 percent of which is used to pay a bloated public service. Only five percent of State revenues have been channeled to capital expenditure. Government will have to invest US\$1, 2 billion to expand and consolidate infrastructure in the power sector, with new investments alone requiring about US\$577 million while rehabilitation projects could guzzle US\$257 million, according to AFDB statistics (2015).

AFDB (2015) commented that Zimbabwe needs policy reforms to attract Foreign Direct Investments (FDI) and means to promote national savings. Domestic money can be used for infrastructure development. Magala AFDB Chief cited in the Financial Gazette (June 2015) stated that Zimbabwe is not able to attract funding due to poor policies. Among the available

options for attracting funding are the Public Private Partnerships model, which Zimbabwe has been pursuing with limited success under the ambitious blueprint unveiled in 2013, the Zimbabwe Agenda for Sustainable Socio Economic Transformation (Zim -Asset).The country could also ride on Diaspora remittances, estimated at US\$1, 5 billion per annum, to channel funding into rehabilitating its ageing infrastructure. The AfDB (2015) suggested that Zimbabwe could also leverage of its rich mineral resources to set up a sovereignty fund to bankroll projects.

The financial Gazette (June 2015) noted that treasury has limited resources to fund projects. Another area of focus for development is the e-Government Transport Management system. The idea is to integrate the transport system, tolling, fines, licensing into the one system so there is efficiency and effectiveness.

2.4.6.1. PPPs in Zimbabwe

The government of Zimbabwe took a policy position to adopt Public-Private Partnerships (PPPs), under which the private sector would partner the government in service delivery. A public policy is a purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern (Anderson, 2005). The goal of the 2004 PPP policy document was to promote sustainable economic growth and development through mutual collaboration between the government and the private sector in the efficient management and operation of infrastructure and other development projects in the country (Government of Zimbabwe report, 2004).

The Zimbabwean government like many governments has been unable to cope with the ever-increasing demands of its budget hence, the validation to opt for PPPs in 1998. Justifying in a press interview in 2010, the former Minister of Finance (Tendai Biti) and the Chief Executive Officer (CEO) of the Infrastructure Development Bank of Zimbabwe (IDBZ) (Mr Charles Chikaura) echoed the same sentiments that the solution to Africa's quest for development is a win-win marriage between public and private sector collaboration and active participation of the private sector in the infrastructure development. This proves that a new approach to government business requires accommodation of private players.

In his study, Harries (2003) also identified a plethora of benefits associated with PPPs. These includes great asset utilisation, innovation, value-for-money, provide a platform for sector-wide cooperation, financing from the private sector, creation of synergy and capacity building, increase the value of business, better risk allocation, attain high efficiency and

quality, and promote competitiveness and fair competition and PPPs do not affect government responsibility.

2.5. Chapter Summary

The focus of this chapter was on reviewing literature on funding models for road infrastructure development. The chapter initially looked at international funding models that are available in general before narrowing down the analysis to some selected developed and emerging economies. The chapter indicated that generally funding models used in South Africa are derived from international models. This has lead the research to look at both international and South African models for adoption into Zimbabwe as highlighted in chapter 4.

CHAPTER 3

3. RESEARCH METHODOLOGY

3.0. Introduction

The chapter presents the research methodology that was used in the study. It therefore outlines the research philosophy, design, study population, research instruments, sample and

the techniques and methods of data collection, processing and analysis. Furthermore, the chapter presents a detailed account of the data sources and the types of data that were collected from different stakeholder groups and organisations.

3.1. Research design

This research used deductive approach to gather information on road infrastructure development funding models by comparing ZINARA and SANRAL. A descriptive survey research design as discussed in Kerlinger (1988: 377) was used to lobby the opinions of individuals in the target population i.e. on ZINARA side regarding the assessment of the funding models for road infrastructure development. In order to collect information about the indicated target group, the researcher carried out a descriptive survey. Collis and Hussey (2013), defines a descriptive survey as a technique used for gathering statistical information about attributes, attitudes or actions of a population by administering standardised questions to some, or all of its members. The basis for this emanates from the fact that target population is comprised of varied but related stakeholders and hence, a survey would enable a quicker comparison of their views and opinions on the study at hand. As a result of the research approach used, the research further follows a positivism approach which focuses on highly structured methodology to facilitate replication (Gill and Johnson, 1997).

3.2. Study population

The study population comprised of the employees from government departments and local authorities. The government departments included ZINARA, DDF and the Department of roads whilst local authorities were comprised of Rural District Councils and urban councils. The distribution of the various categories of the surveyed road authority population is illustrated in Table 1 below.

Table 1: Population distribution of the road authorities and ZINARA

Department	Population	Remarks
RDC	60	Local authority
DDF	1	8 provincial offices government

DOR	1	8 provincial offices- Government
Urban councils	32	-local authority
ZINARA	1	Autonomous
Total	95	-

Source: Author's compilation

3.3. Sampled population

Tabachnik and Fidell (2001) define a sample as that part of a large population that gives a representation of the entire population. The sample should have properties that make it representative of the whole. Generalisations of populations from data collected using any probability sample are guided by probability laws and assumptions.

There are 95 stakeholders that can be categorised as government departments and local authorities in the study area and the sampling was carried out in the major headquarters of the towns, where both stakeholders are found. Because the research is aimed at the assessment of the funding models for road infrastructure development in Zimbabwe, the major suppliers of information were made to be those institutions already managing and servicing the various road networks in the country. In this research government departments refers to DDF, DOR and ZINARA while local authorities comprise of RDCs and UCs.

A sample size of 55 respondents from a target population comprised of two strata making up the key stakeholders in the study area were selected using a purposive stratified sampling technique (Table 2). The researcher used stratified purposive sampling for the selection of study respondents from the target population since the stakeholders referred to above have varied but related perceptions about the different infrastructural development funding models that the country could adopt for use.

As the statistics in Table 1 above shows, the population is divided into the following groups i.e. road authorities were divided into RDC (60), UC (32), DOR (1) and DDF (1), ZINARA (1) with 5 departments. These categories were further subcategorised into two strata, namely government or quasi-government departments and local authorities.

Table 2: Sample size requirements and strata used

Population	Target group	Number sampled
Government	✓ Management	25
Local authorities	✓ Employees	30
Total number		55

Source: PSCs survey, 2015.

3.4. Research instruments

3.4.1. Purposive sampling

Interviewees were selected through purposive sampling, a variant of non-probability sampling. Lancaster (2005:136) is of the opinion that it is more effective to interview those who can shed light on the issue being explored; who are likely to volunteer in providing the data most readily and who might be approached for information. It is a judgemental form of sampling in which the researcher purposely selected certain groups or individuals for their relevance to the issue being discussed. It is less sophisticated and cheap; the researcher took advantage of the available and perhaps unanticipated respondents. Primarily, this researcher opted for this method because of its cost effectiveness and in-depth knowledge for this research to use purposive sampling. In this case all respondents who were given questionnaires were interviewed in order to get more information.

3.4.2. Questionnaires

Saunders et al (2003) regards a questionnaire as the most extensively used method for accumulating primary data in a study area. A questionnaire is described as a document that asks some questions from all individuals of the sample. For that reason, the researcher utilised a structured questionnaire in order to get the views of the respondents about the questions in the research. Likert scales with a scale range of 1-5, ranging from strongly agree to strongly disagree as provided by Tabachnik & Fidell (2001) was used. This method was used in order to capture the desired information and consequently, to produce quality results. As such, questionnaires were used as data collection instruments because of their

applicability to the survey research design (Oberst, 1993). The major advantage of using a questionnaire is that it can be administered to large numbers of people at the same time and respondents will respond to same questions which will improve precision of the results.

Some open-ended questions were also provided in the questionnaire as they are adaptable to studies based on the qualitative analysis of data and they collect data of a perceptive nature. This also gives a rich interpretation of data relevant for the study at hand. Open-ended questions also prevents giving false answers from the research participants. In order to probe the views and opinions of the respondents, some closed ended questions were also included. Closed ended questions would make it possible for the research participants to answer the questions faster. Structured questions allow for comparison and quantification of the results and responses which also makes recording easy.

The biggest advantage of using closed ended questions is that the response rate can be very high since questions will not take much of the participant's time. However, open ended questions make it possible for the respondents to explore some details which may not be expounded in a closed ended question. Various strategies were used to counter questionnaire shortcomings including putting emphasis to the aspect of anonymity by discouraging respondents from writing their names and any information that identifies them. The researcher also countered the issue of omitted questions perceived to be ambiguous by phrasing the questions using simple language that is easily interpretable by anyone.

The research used questionnaire and interview as research instruments because they encourage high response rate and they are cost effective methods. In addition, the two methods complement each other in that interview assisted the respondents to provide more information on possible omissions.

3.5. Validity and reliability of research instruments

3.5.1. Pilot study to test the questionnaires

In order to ensure that all the data collected from the questionnaires were valid and reliable. Every questionnaire was subjected to a formal pre-pilot exercise during which the

acceptability, validity, and reliability of the measures and constructs were tested. Thus, the pilot was based on the same population on which the final data for the survey was collected.

Two weeks were spent pre-piloting the questionnaire to ensure that the whole range of responses were included for each question. The questionnaire was pre-piloted to identify ambiguities in the questions and to identify the range of possible responses for each of the formulated questions. This was done by consulting fellow colleagues and friends from the various strata of the target population with a direct or indirect interest in the road development sector who went through the questions together with the researcher in order to identify problematic areas. Noted problem questions and sections were consequently improved and amended before the final administration.

3.6. Data collection procedures

3.6.1. Administration of the questionnaires

Prior informed consent was made to the prospective research participants before the actual distribution of the questionnaires. The questionnaires were thus distributed to the respondents by hand to the road authority institutions and an appointment to collect the completed questionnaires was made with the company secretary.

3.6.2. Interviews

The interviews were carried out in confidentiality and in secure environments with each session taking approximately twenty five minutes. Interviewees were asked to indicate areas that the interviewee could have omitted during the questionnaire survey before the researcher left. The researcher wrote down the responses that were provided during the interview sessions.

3.7. Presentation, analysis and interpretation of data

Qualitative data was thematised and categorised while quantitative data was presented in the form of bar charts, tables, pie charts, histograms and percentage frequencies in line with the objectives of the study.

Data entry was done using a combination of Microsoft Excel and the STATA statistical package. The data was also analysed using the interplay of Microsoft Excel and STATA statistical package. Microsoft Excel was used as the data entry and capturing spread sheet and pre-processing of the data before being exported to the STATA statistical environment for analysis. On the other hand, the specialised STATA statistical package was used for the analysis, generation of graphical outputs and statistical inference.

3.8. Ethical considerations

The following ethical considerations proffered by Patton (2002) were observed during the study. During the data collection and questionnaire administration exercises, most of these ethical issues were addressed. For example, a prior informed consent was given by making sure that all the potential participants in the study were informed well ahead of time about the researcher's visit. Confidentiality issues was guaranteed as can be shown on the introductory remarks on the research instrument (questionnaire) shown in the appendices.

3.9. Limitations

The major limitation encountered in this study was reliance on secondary data especially for SANRAL agent where all the data was obtained from the annual reports and strategic plan document.

3.10. Chapter summary

The focus of this chapter was on the research strategy (survey), population sample size, sampling design and procedures, instruments design, data collection procedures, presentation, analysis and interpretation. Methodological aspects involving research instruments namely the questionnaire and the interview guide were considered on their strength and weaknesses as well as their validity and reliability. Though there were some limitations in the data

collection tools used, they were however, of great help in the collection of data for the purposes of this research. The next chapter will focus on results and findings.

4.CHAPTER: RESEARCH RESULTS AND FINDINGS

4.1. Introduction

The chapter presents results of the analysis of data collected from government departments, local authorities, ZINARA and SANRAL. The data from the questionnaire was analysed using STATISTICA, a statistical software used for analysing data. Different statistical analysis methods such as percentage frequencies, means, and standard deviation were used in the interpretation of the findings. The results are presented in the same sequence as they appear on the questionnaire in line with research questions.

4.2. Interview and Questionnaire Survey Response rate

Fifty five (55) questionnaires were administered to the respondents in the target population comprising of respondents from local authorities and government departments (DDF, ZINARA and DOR) in the surveyed institutions countrywide as illustrated in **Table 3**. The responses from the selected sample i.e. the various interviewed and surveyed employees from the institutions' headquarters gave an overall 84% response rate as illustrated in **Table 3** arising from a return rate of forty six (46) out of a total of fifty five (55) administered questionnaires. Further details regarding the response rates of the different strata are presented in **Table 3**.

Hence, the results of the study relied on the returned 46 questionnaires that comprised employees from local road authorities and road authorities in government ministries as illustrated in Table 3 and these were taken as the final participants of the study. This subsequently formed the sample size upon which data analysis for this study was based.

Table 3: Response rate of the interview and survey

Population	Target group	Distributed	Returned	Response Rate	% Response rate
Government	✓ Management	25	22	0.88	88
Local authorities	✓ Employees	30	24	0.80	80
Σx		55	46	1.68	168
\bar{X}		27.5	23	0.84	84

Source: Sampling survey, 2016

4.2.1. Working experience

The majority of employee respondents (56%) that include clerks, road maintenance operators, drivers and officers are found in local authorities and had work experience of more than 20 years whilst the biggest proportion of the surveyed respondents in government departments (49.8%) have working experience ranging from 5-10 years as illustrated in Figure 1. An insignificant proportion of local authority respondents (3.5%) have work experience of less than 5 years whilst a sizable proportion of the government employee respondents (13.5%) have work experience ranging from 11-15 years.

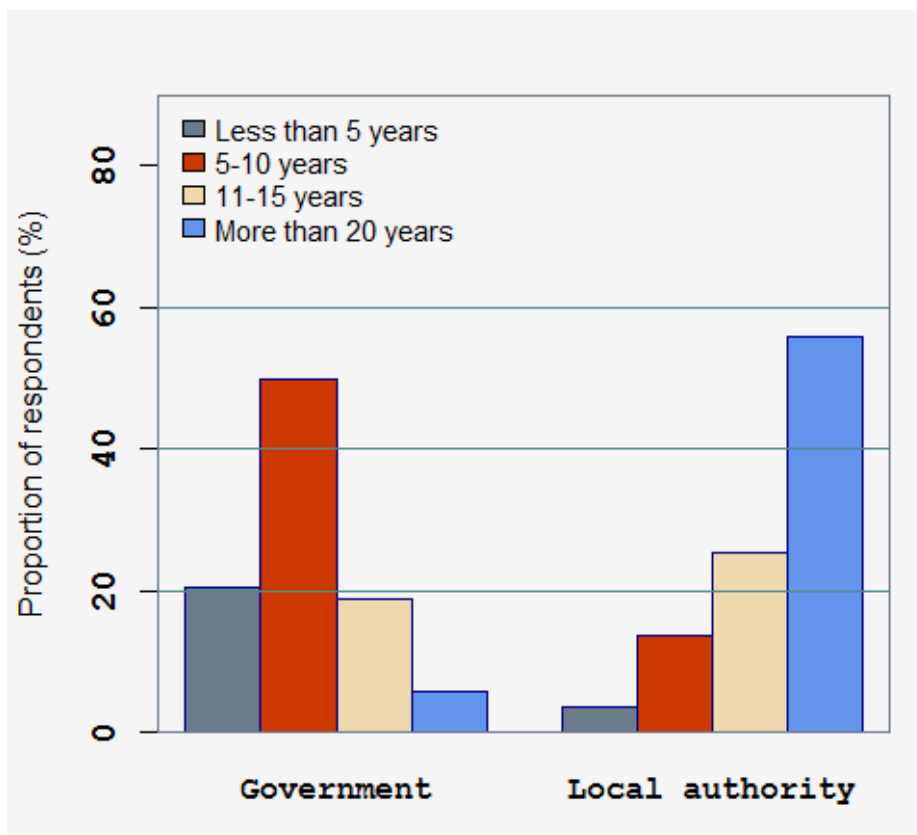


Figure 1: Work experience (Road authorities)

These results are consistent with existing trends in the road industry that, the local authorities that include entities like urban councils and the rural district development councils have the longest serving members in comparison to government departments that include DDF, DOR and ZINARA. As such, local authorities have the highest proportion of experienced staff. On the other hand, it is common to see the less experienced staff of the road industry in

government as there is high employee turnover than in the local councils. As noted by Jacobson and Choi (2008), most of the employees in government are professionals and hence, are flexible to move from one job to another in pursuit of better working conditions.

4.2.2. Academic profile of the respondents

The highly qualified respondents of the surveyed population of local authorities (40.5%) and government officials (49.5%) hold at least a diploma qualification. On the other hand, the highest proportion of degreed employee respondents are found in the government departments (30 %) whilst the least qualified respondents (25 %) are found in local authorities as illustrated in Figure 2 below.

As evident in Figure 2, not many employees in both the government (6 %) and the local authorities (5 %) hold post graduate qualifications. Because of professionalisation, an insignificant proportion of the interviewed government employee respondents have no basic ordinary level (0.5 %) qualifications. For that reason, the results depicted in Figure 2 are consistent with the prevailing situation in the Zimbabwean road industry.

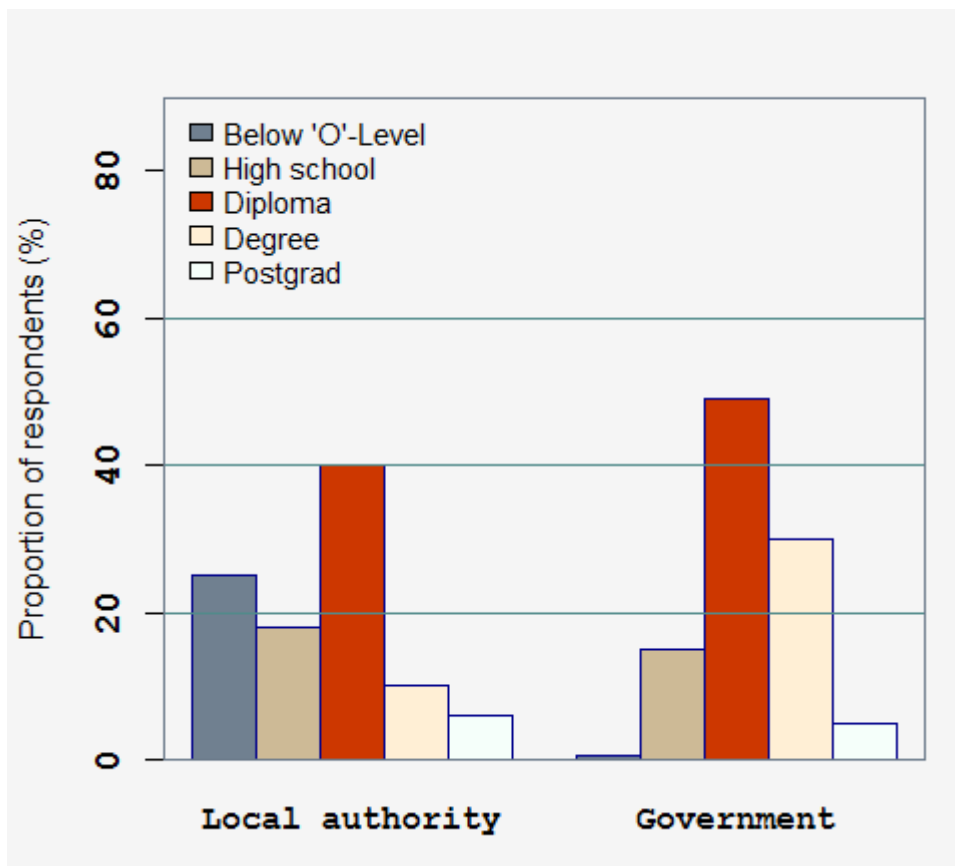


Figure 2: Education level

4.2.3. Age distribution of respondents

An analysis of the age distribution of the research participants in the road industry in local authorities and government departments shows aged employees to be in the rural district councils (between 37 - 58 years) whilst the youngest respondents is found in the Zimbabwe National Road Administration (ranging from 22 - 42 years). The District Development Fund, the Urban Councils and the Department of Roads have age distribution of 25 - 45, 25 - 56 and 28 - 49 years respectively as shown in Figure 3 below.

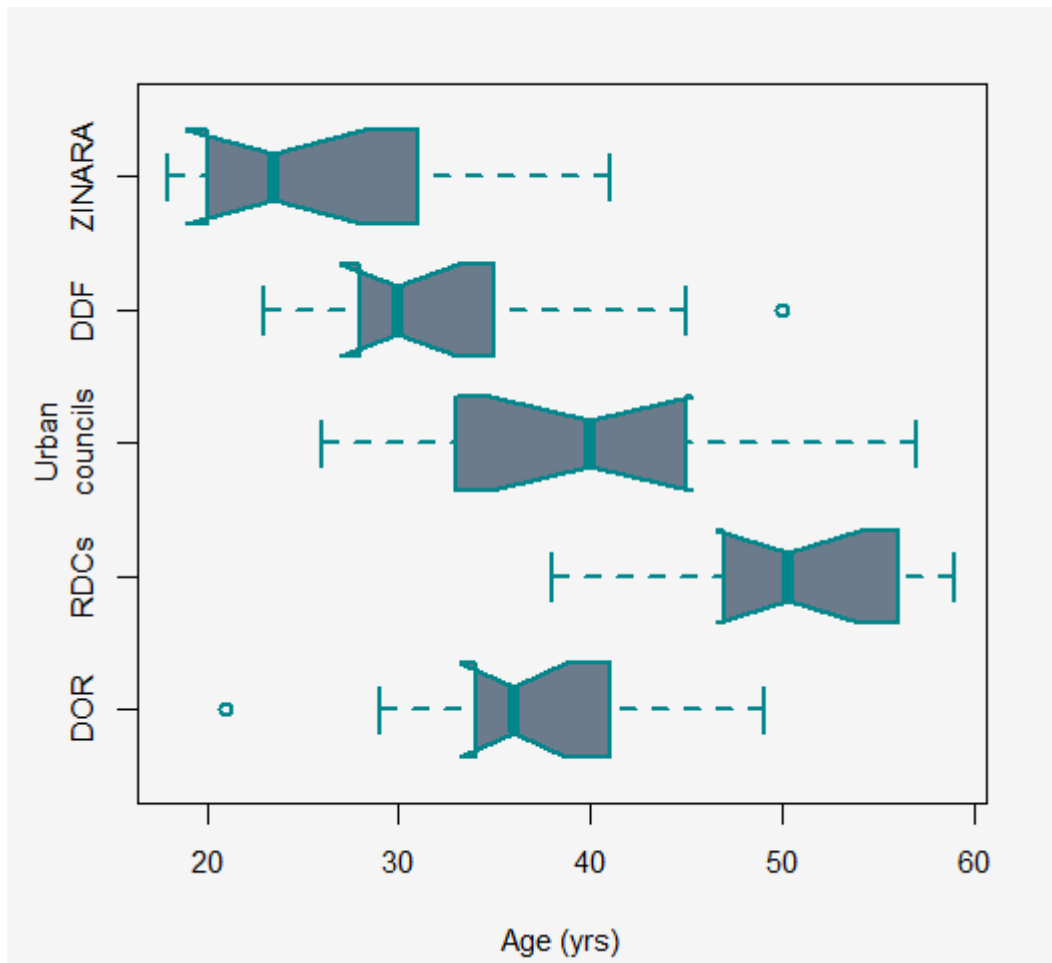


Figure 3: Respondent age distribution

The Urban Councils have the largest age range (26-58 years) of employee respondents in comparison to the other respondent categories like ZINARA (19-42 years), DDF (21-45 years), RDCs (38-58) and the Department of Roads (DOR) (28-49 years). This means that the

Urban Councils have the widest variety of age categories in its employee establishment in comparison to the other entities like the RDCs and the DOR as illustrated in **Figure 3** above.

4.3. Empirical analysis

4.3.1. International funding models Analysis

Eight road infrastructural development funding models in use on the international arena were investigated to assess their suitability for adoption in Zimbabwe. Most of these investigated funding models have been used in both emerging and developed economies. As such, as Table 4 below illustrates, the study investigated the possibility of adopting public financing, private financing, PPPs, the Regulated Asset Base (RAB), public sector subordinated funds, infrastructure bonds, tax incremental financing and public sector minimum guarantees. There is evidence (Table 4) that respondents from both the government and local authority institutions believe that the government of Zimbabwe should adopt models like public financing, private financing, infrastructure bonds and PPPs, Table 4.

Table 4: International funding models

Questionnaire Items	Government				Local authority			
	<i>Max</i> (%)	<i>Min</i> (%)	<i>Mean</i>	<i>SD</i>	<i>Max</i> (%)	<i>Min</i> (%)	<i>Mean</i>	<i>SD</i>
Public financing	48	22.6	4.4	0.43	54	22.3	3.8	1.2
Private financing	65	19	4.2	0.46	48	13.4	4.2	0.8
Public-Private Partnership (PPPs)	49	35.5	4.5	0.49	58.5	21.6	4.1	0.9
The Regulated Asset Base (RAB)	59	12	1.3	0.68	60.1	12.6	1.7	1.5
Public Sector Subordinated Funds	66	8.9	2.1	0.83	47.9	18.9	1.7	1.3
Infrastructure Bonds	58.1	26.9	4.2	0.51	55.6	19.5	3.9	2.1
Tax Incremental Financing	51	6.7	1.4	0.91	47.6	22.6	2.1	1.6
Public Sector Minimum Guarantees	54	33.5	2.0	0.62	46	14.8	1.8	1.7

Source: Sampling survey 2016.

Forty eight percent 48% (mean=4.4, s.d=0.43) and 54% (mean=3.8, s.d=1.2) of the government and local authority respondents respectively, agree that the Zimbabwean government should use public financing as one of their funding models for road infrastructure development. Sixty five percent 65% (mean=4.2, s.d=0.46) and 48% (mean=4.2, s.d=0.8) of the responding government and local authority participants respectively, strongly agree to the use of private financing by the government of Zimbabwe. PPPs are also a plausible infrastructural development model. As the results illustrated in Table 4 show, 49% (mean=4.5, s.d=0.49) and 58.5% (mean=4.1, s.d=0.9) of the interviewed government and local authority respondents agree that PPPs are good for adoption in Zimbabwe. 59% (mean=1.3, s.d=0.68) and 60% (mean=1.7, s.d=1.5) of the responding participants from both the government and local authority representatives respectively, disagree with the adoption of the Regulated Asset Base (RAB) as a major infrastructural development funding model in the country.

On the other hand, the responding officials from government and local authorities do not believe public sector subordinated funds and tax incremental financing to be suitable road funding models for adoption in the country. Consequently, as Table 4 illustrates, 66% (mean=2.1, s.d=0.83) and 48% (mean=1.7, s.d=1.3) of the responding public do not believe public sector subordinated funds to be suitable for use in Zimbabwe. Similarly, tax incremental financing is not an appropriate model for adoption in Zimbabwe. As such, 51% (mean=1.4, s.d= 0.91) and 48% (mean=2.1, s.d= 1.6) of the interviewed government and local authority respondents respectively, disagree with the notion of using tax incremental financing as an infrastructure funding model, Table 4.

Infrastructure bonds are seen by the sampled respondents from both the government and, local authorities as potential and suitable funding models for adoption in the country. Hence, 58% (mean=4.2, s.d= 0.51) and 56% (mean=3.9, s.d=2.1) of the participating public officials from the government and the local authorities respectively, agree that infrastructure bonds will be suitable model for use in Zimbabwe. In a similar vein, the majority of the government respondents, (54%, mean=2.0, s.d=0.62) and local authority respondents, (46%, mean=1.8, s.d=1.7) respectively, disagree with the idea of using public sector minimum guarantees as a road infrastructure funding model, Table 4.

For that reason, there is strong evidence that the popularity recognised road infrastructure funding models throughout the world are the ones that the sampled population would want

Zimbabwe to adopt. As such, as the findings of Runyan, Ge, Dong, & Swinney (2012) show, public financing, private financing, PPPs through concessions and infrastructure bonds have widely been adopted as major infrastructure funding models in both developed and emerging economies. The best examples of where these models have been adopted successfully are in Japan, South Africa, the US and Australia.

Road infrastructure development funding models like private financing and public financing offer tremendous advantages for emerging economies (Boarnet & Dimento, 2013). For instance, as the discussion of Price (2011) show, these development models provide retained earnings from user charges and fees for access to infrastructure; capital contributions or payments from government for non-commercial services that Government Trading Enterprises (GTEs) are directed to provide; bond issuance and borrowing from banks.

4.3.2. SANRAL funding models suitable to Zimbabwe

An investigation of the road infrastructure funding models that may be suitable for adoption in Zimbabwe using case study of neighboring South Africa shows that respondents from both local authorities and government departments agree on the funding models to use. As illustrated in Figure 4 below, interviewed respondents from both institutions (government and local authorities) believe that Zimbabwe should adopt the use of government appropriations, use of concessions through PPPs, capital market borrowings and the use of Direct Foreign Investments and loans backed by Export Credit Agencies. These results are supported by the illustration in Figure 4, indicating 50.7 % (mean=4.2, s.d=0.89) and 60% (mean=4.5, s.d=1.1) of the respondents in government and local authorities respectively, agreeing that the country should use government appropriations (national treasury). On a similar note, 63.7% (mean=4.1, s.d=1.4) and 55.9% (mean=3.9, s.d=1.3) of the surveyed government and local authority respondents respectively, strongly agree that the government of Zimbabwe should use concessions through PPPs.

As the results of Figure 4 show, capital market borrowings also emerged as a possible funding to adopt in Zimbabwe. As such, 40.7% (mean=3.8, s.d=0.7) and 51% (mean=4.2, s.d=1.1) of the participating government and local authority respondents respectively, agree to the use of capital market borrowings, Figure 4. 46% (mean=4.2, s.d=1.3) and 50% (mean=3.8, s.d=1.6) of the participating stakeholders from government and local authority institutions respectively, agree that the government should use Direct Foreign Investment and

loans backed by Export Credit Agency. However, respondents from the two institutions, that is government and local authority departments do not believe the use of bank loans will improve the situation in the country. For that reason, 44.7% (mean=1.2, s.d=2.6) and 51% (mean=2.1, s.d=3.2) of the interviewed government and local authority respondents respectively, strongly disagree with the adoption of bank loans as a road infrastructure development funding model as illustrated in Figure 4 below.

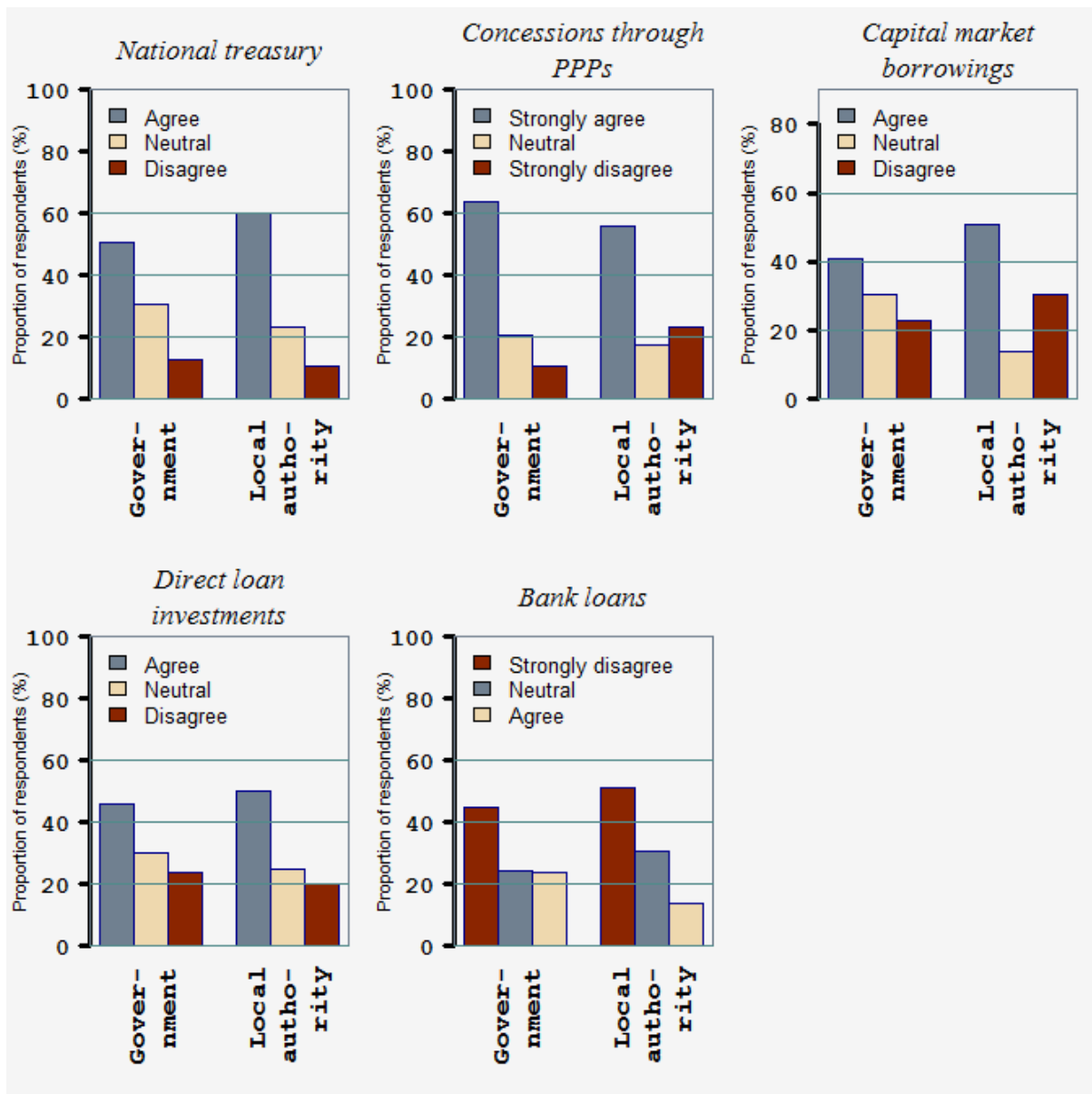


Figure 4: Suitable South African models for adoption in Zimbabwe

The results of the present study share its findings with the findings of Innes & Booher (2010) and Grimsey and Lewis (2004) who established that the most viable funding model for

developing and emerging economies is through government appropriations and concessions. However, the authors went on to emphasise how governments can deal with often expensive and unsustainable Public Private Partnerships. PPPs can prove difficult to service in the long run and the burden usually weighs heavy on the government for the last years of the road infrastructure projects. According to Silva (2000), PPPs are meant to promote sustainable economic growth and development through mutual collaboration between the government and the private sector in the efficient management and operation of infrastructure and other development projects. However, due to inefficiencies and inconsistencies brought about by corruption and misappropriations, PPPs are usually difficult to manage and service in developing countries.

Consequently, Terziovski (2010) and Wiklund and Shepherd (2011) recommends the use of capital market borrowings, government appropriations, concessions involving PPPs and , the use direct foreign investment and loans backed by export credit agency. Furthermore, the SANRAL, Strategic Plan 2012/2017 reports that the majority of the funding for non-toll roads comes from tax-based revenues generated by the national government and disbursed through appropriations.

4.3.2.1. Road condition

The results of a road condition survey conducted at local road authorities and quasi-government departments clearly shows the dire need for road infrastructure servicing and maintenance. 45%, 40%, 35%, 35%, 30% and 25% of the employee respondents in the aforementioned entities regard the condition of surface roads, gravel roads, earth roads, drainage systems, street lighting and bridges, respectively, as worse as illustrated in Figure 5 below.

This assessment justifies the need for road infrastructure funding model that will service and maintain the various road types found in Zimbabwe under the management of different road authorities. The results of this assessment also agree with everyday experience of the road situation in Zimbabwe, where most roads in the urban areas are pot-holed and are beyond repair. In the event of heavy rain falls, the drainage system is in such a bad state that it is unable to cope with flowing water in the roads resulting in flooding in most roads. In worst cases, motorist would have to stop driving to avoid damage of vehicles in flooded roads.

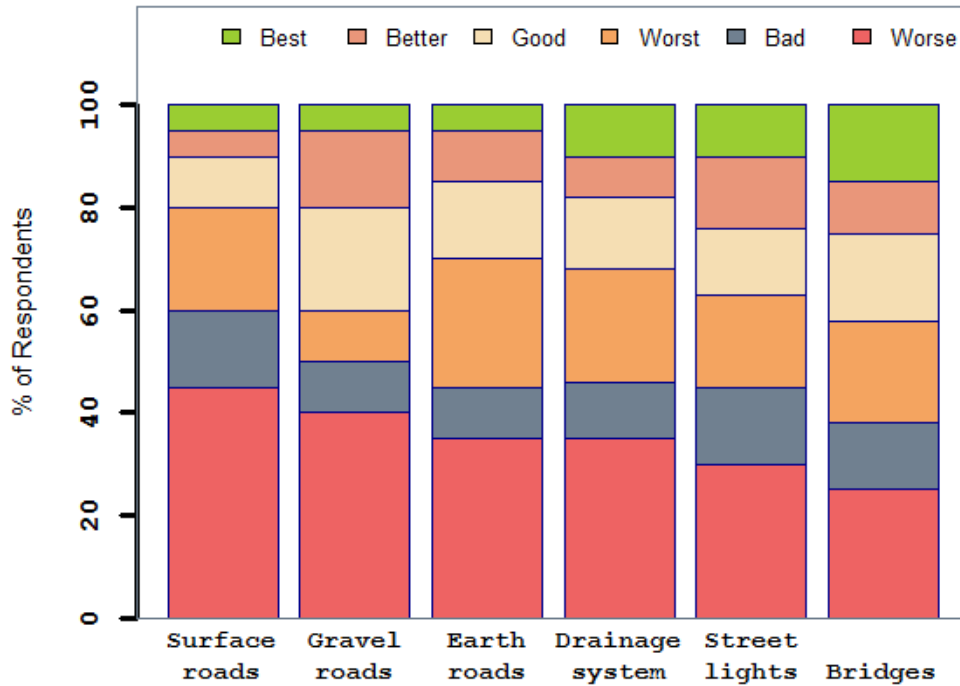


Figure 5: Road condition

Furthermore, according to Fidhaler (2000), the urban local authorities last maintained street lighting more than a decade ago, with most of the lights either being vandalised or stolen altogether. As such, there is need for a sustainable fund that will be channeled towards provision of these services to make the life of motorists and other road users safe and comfortable. The greater part of rural roads are gravel roads and with lack of maintenance, most of the gravel has been eroded resulting in serious galleys and bridge damages that makes them impassable. Road authorities like the DDF and the DOR are responsible for the maintenance of rural roads, but with a constrained economy due to poor investment and liquidity challenges, it has become difficult for these authorities to continue servicing the roads.

4.3.2.2. Satisfaction with the funding model

Research participants are not satisfied with the existing funding models, with the majority of the informants (79%) from the local and government road authorities disagreeing, Figure 6. This is because the existing funding model heavily relies on user charges, among them are; vehicle licensing fees, toll fees, transit fees, overload fees, fuel levy and abnormal load fees.

Satisfaction with the funding model

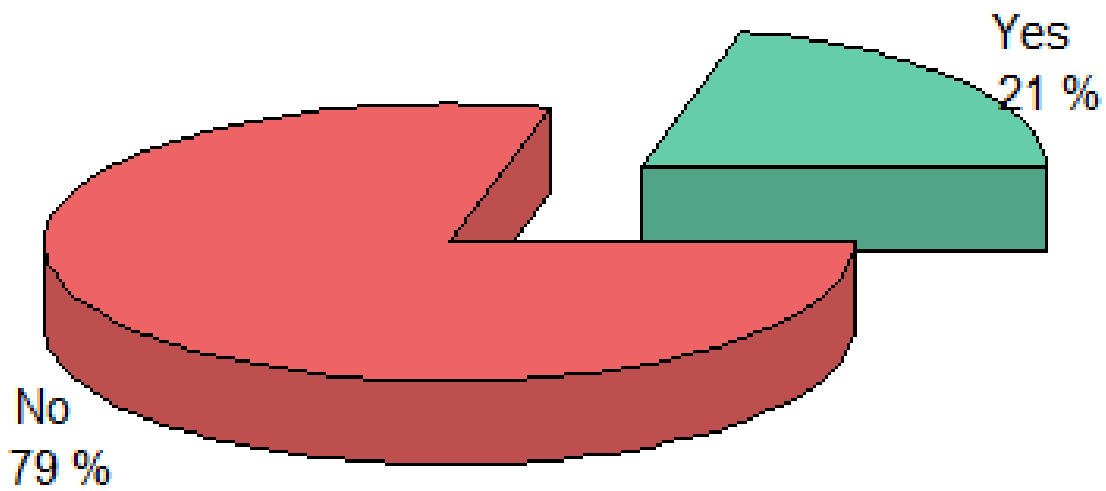


Figure 6: Stakeholder satisfaction

4.3.2.3. Stakeholder involvement

There is clear evidence that the road authorities are not involved in resource allocation by the government led road fund, ZINARA.

Involvement in resource allocation

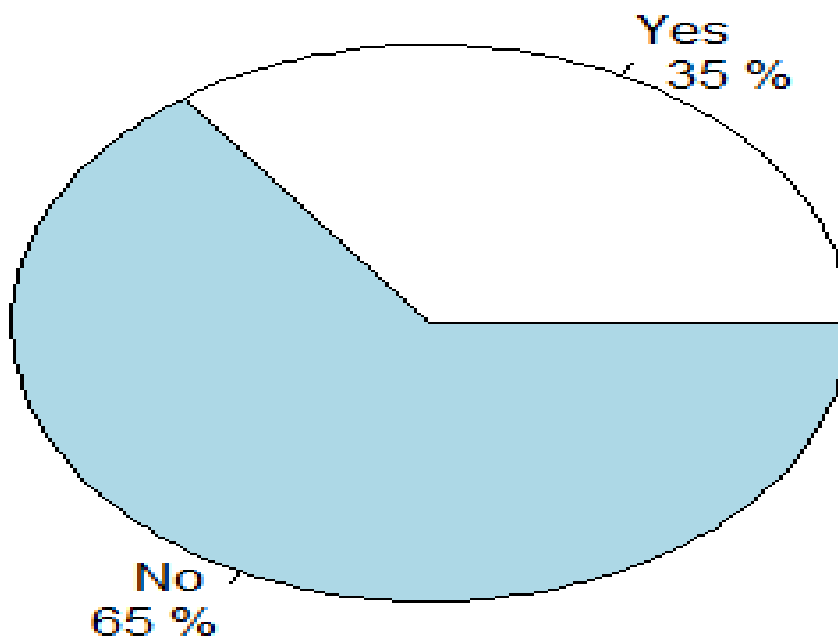


Figure 7: Stakeholder involvement

This means that whatever the possible strategies that the road fund may come up with will not receive the buy-in of the various stakeholders since there is no participatory approach and enough consultation during budgeting. For that reason, the greater proportion of the interviewed respondents (65%), Figure 7, do not agree that ZINARA involve their stakeholders during resource allocation.

4.3.2.4. Funding model administration

The majority of the surveyed respondents in both the government departments (70%) and local authorities (75%) do not believe that the existing model of funding infrastructure development through ZINARA is working well. As illustrated in Figure 8 below, respondents have doubts that the current funding model of relying on user charges is working to the expectations of the stakeholders.

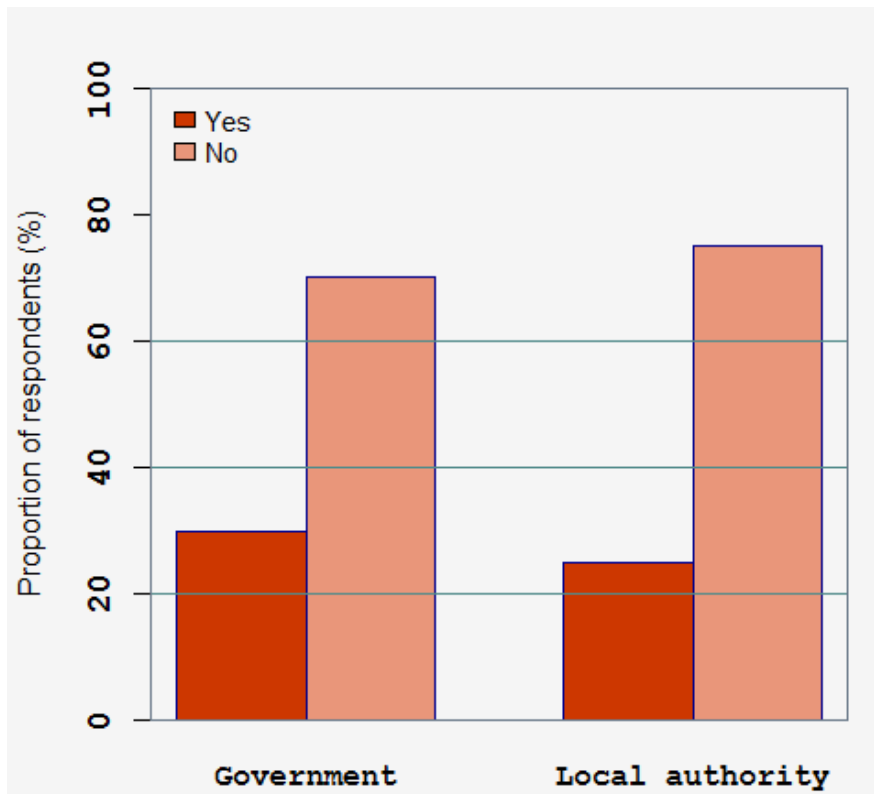


Figure 8: Funding model administration

4.4. Revenue turnover for the period 2009-2015

An investigation trying to establish whether there is a significant difference between the revenue turnover of the two road funds, ZINARA and SANRAL for the period 2009 to 2015 was done using an independent samples t-test. The null and alternative hypothesis were therefore given as follows:

H0: There is no statistically significant difference in revenue turnover between SANRAL and ZINARA for the period beginning 2009 to 2015

H1: There is a statistically significant difference in revenue turnover between SANRAL and ZINARA for the period beginning 2009 to 2015.

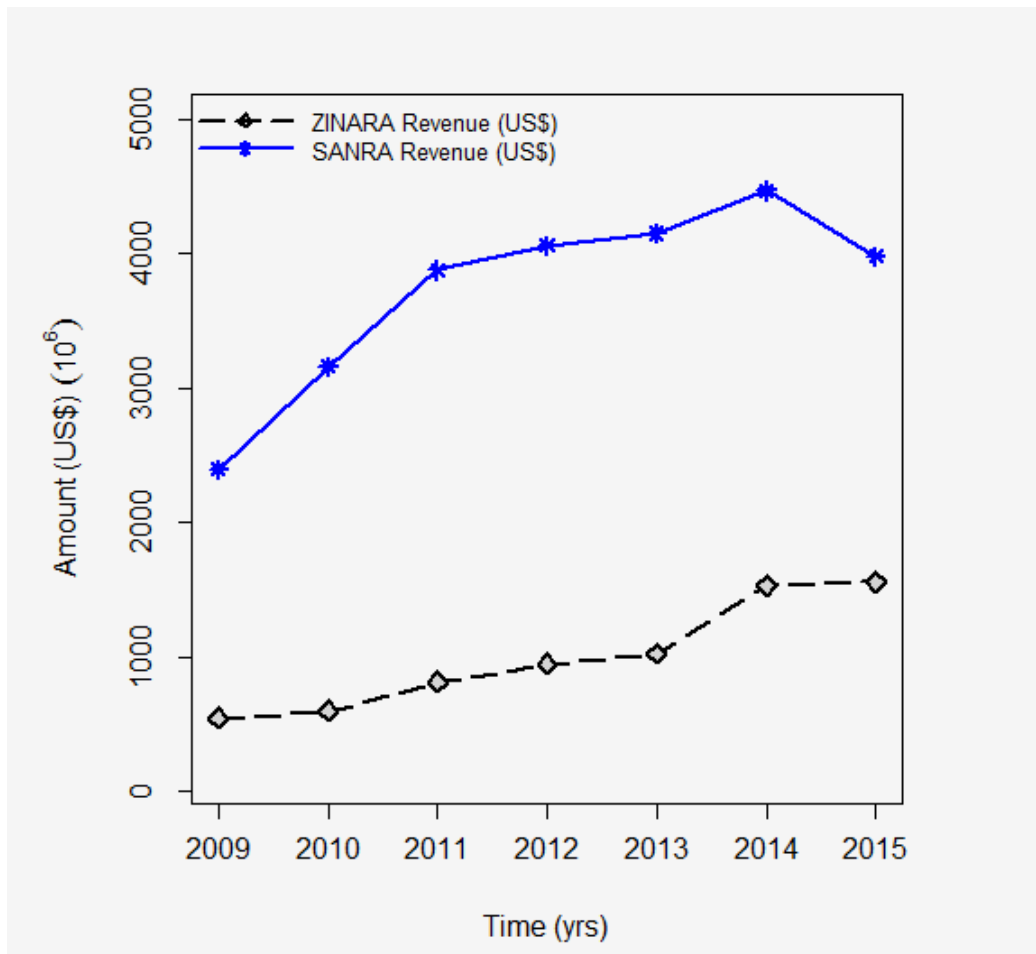


Figure 9: Revenue turnover for SANRAL and ZINARA

The results of the independent samples t-test resulted in the null hypothesis (H₀) being rejected ($t_{-6} = 13.49$, $P = 0.000$), in favour of the alternative hypothesis at the 95% significance level. These results are further supported by the graphical display of the revenue turnover of the two road funds from 2009 to 2015, showing SANRAL to have a significantly higher mean revenue turnover (US\$372 994 468-00) than ZINARA (US\$99 905 030-00). The fact that Zimbabwe introduced its road toll fees in 2009 after the adoption of the multi-currency system meant that revenues collected were low in the first few years and gradually increased until 2015 when the road fund recorded its highest revenues from toll fees. On the other hand, the South African tolling system had long been established than that of Zimbabwe and as the result Figure 9 above show the comparative period beginning 2009 for the study saw the global revenues of SANRAL (\$2 395 470 950-00) significantly higher than that of ZINARA (\$539 984 270-00).

Figure 10 shows the analysis of tolling revenue between the two road funds. Tolling revenue was chosen among other revenue sources because both road funds collect this revenue stream as illustrated in table 5 and 6 below.

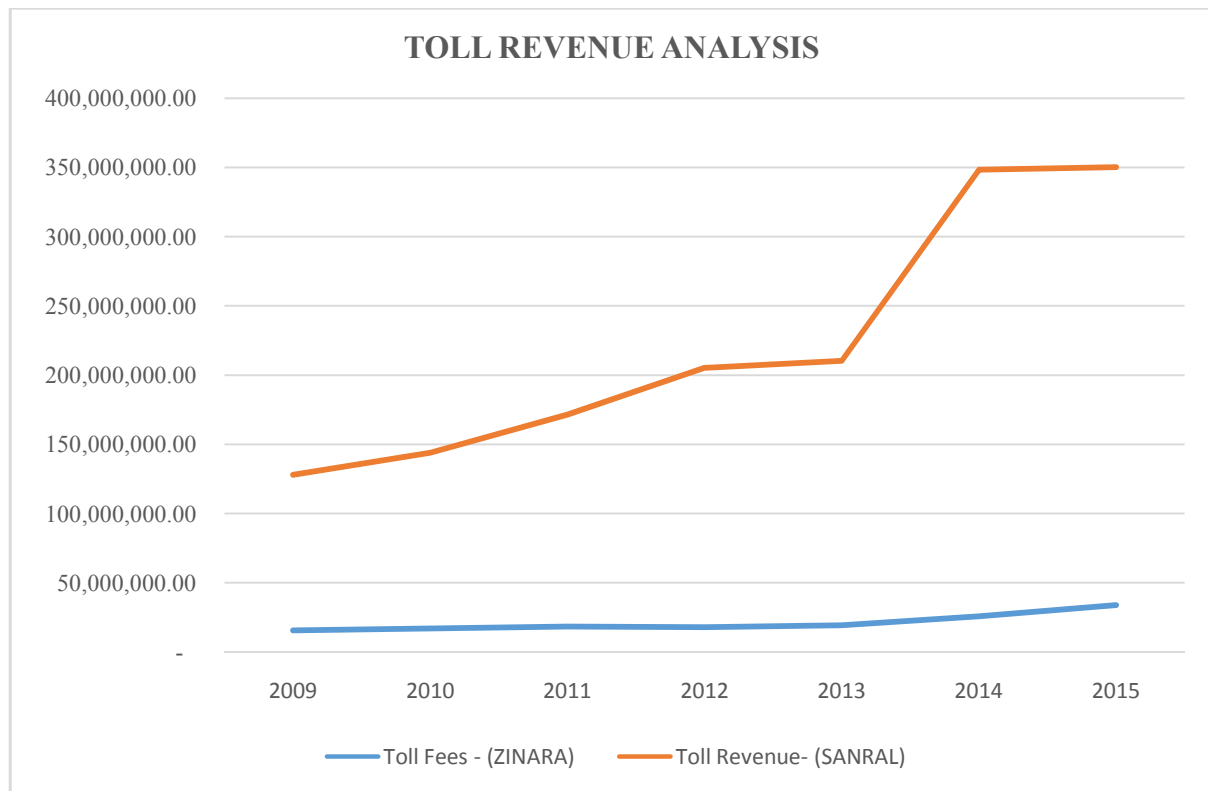


Figure 10: Tolling Revenue analysis

Figure 10 is showing that SANRAL collects more toll revenue compared to ZINARA. Zhou and Chilunjika (2013), argued that the South African tolling system had long been established and the country has invested much in tolling technology. In addition, the country had introduced urban tolling which is not currently in Zimbabwe. There are fifty one toll gates in the entire country spread out throughout the provinces (www.nra.co.za). The SANRAL does not itself run toll gates; they are run by contracted private companies (such as N3 Toll Concessions, Trans Africa Concessions, Intertoll, Concor Marib, Tuncor among others.) which have appropriate technology, infrastructure and human capital to run toll gates on their behalf. However, in Zimbabwe only nine tollgates along the Plumtree – Mutare corridor are managed by Intertoll (a private party) which is experienced and the rest (17 tollgates) are run by ZINARA itself.

The revenue turnovers of the road funds both peaked in 2014 (Figure 9), with South African revenue significantly dropping in 2015. In addition to a deteriorating economy coupled with high unemployment, Flyvbjerg (2012) strongly believe that the sharp drop in revenues was mainly caused by the weakening rand against other major currencies like the US dollar. However, Drucker (1985) and Smith & Cao (2007) hold a different view and attribute the differences in revenue turnover between SANRAL and ZINARA to differences in methods and models being used in the collection of the revenue. As highlighted in the aforementioned paragraphs, SANRAL employs a number of models towards funding its road infrastructure.

The analysis of revenue turnover between the two road funds revealed that ZINARA is currently heavily dependent on road user charges i.e. abnormal load fees, fuel levy, overload fees, toll fees, transit fees, and vehicle licence fees. Other ancillary revenue is coming from commission based income in which ZINARA is a collecting agent of other government Ministries or departments like Road Access Fees and New Limpopo Bridge Tolls as an agent of the MOTiD. Table 5 below illustrates ZINARA revenues sources.

Table 5: ZINARA Revenue Figures

Abnormal load Fees	653,450.00	1,093,443.00	3,624,990.00	6,499,870.00	10,289,808.00	11,958,270.00	7,246,728.00
Fuel Levy	219,657,945.00	237,693,084.00	233,412,320.00	345,605,559.00	428,031,314.50	434,183,630.00	529,982,844.00
Overload Fees	15,120,407.00	23,645,250.00	7,804,485.00	19,004,320.00	15,198,582.00	15,384,495.00	19,587,828.00
Toll Fees	77,284,935.00	84,115,315.00	91,180,725.00	89,311,280.00	95,863,535.00	127,998,685.00	168,306,815.00
Transit Fees	119,873,450.00	136,638,841.50	145,808,037.00	159,153,200.00	178,000,903.50	235,425,931.00	215,984,288.00
Vehicle licence Fees	107,214,912.00	110,675,352.00	207,928,922.50	326,203,710.00	293,834,315.50	216,834,677.50	184,982,171.40
Other Income							
New Limpopo Bridge Tolls (NLB)	-	-	-	-	-	1,504,165.00	2,156,804.00
Z.B.C Commission	-	-	-	-	-	191,592.00	1,402,708.00
Road Access Fees	-	-	-	-	-	245,897.00	677,097.00
Presumptive tax	-	-	-	-	-	12,986.00	43,439.00
Total Revenue	539,805,099.00	593,861,285.50	689,759,479.50	945,777,939.00	1,021,218,458.50	1,043,740,328.50	1,130,370,722.40

Source:ZINARA Annual Reports (2009 to 2015)

On the other hand, the analysis of SANRAL revenue shows that the road fund finances its road infrastructure development using a range of revenue sources. The main revenue sources being tolls, government grants, European Investment Bank and bonds. Table 6 below illustrates;

Table 6: SANRAL Revenue Figures

Revenue	2009	2010	2011	2012	2013	2014	2015
Toll Revenue	127,845,678.90	143,736,300.00	171,420,000.00	205,060,000.00	210,140,000.00	348,161,200.00	350,098,030.00
Government Grants	198,690,070.80	233,144,200.00	335,760,000.00	448,860,000.00	486,350,000.00	507,504,500.00	550,090,098.00
Other Income	45,089.70	66,619,500.00	16,640,000.00	50,460,800.00	84,018,000.00	55,366,100.00	64,090,068.00
Other Funding							
European Investment Bank Loan	9,000,023.40	12,000,000.00	115,000,000.00	210,098,678.00	123,698,070.00	219,045,089.00	230,098,098.00
Current Bond Portfolio	1,509,890,087.60	2,023,056,090.00	2,690,000,000.00	2,700,078,956.00	2,700,078,990.00	2,890,078,030.00	2,229,600,980.00
Guaranteed HWAY and Non-guaranteed NRA bonds	550,000,000.00	683,700,000.00	550,000,000.00	450,000,000.00	550,000,000.00	450,000,000.00	560,090,060.00
Total Revenue	2,395,470,950.40	3,162,256,090.00	3,878,820,000.00	4,064,558,434.00	4,154,285,060.00	4,470,154,919.00	3,984,067,334.00

Source: SANRAL Annual Reports (2009 -2015)

4.5 Chapter Summary

The focus of this chapter was on research results and findings. The findings of the research revealed that the government of Zimbabwe can adopt public financing, private financing, public-private partnerships and infrastructure bonds as international funding models. Consequently, the government can adopt national treasury funding, concessions through PPPs, capital market borrowings and Direct Foreign Investment as potential sources of funds for road infrastructure development. The study also revealed that SANRAL had more revenue turnover in comparison to ZINARA for the past seven years from 2009 to 2015.

CHAPTER 5

5. CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter looks into conclusion and recommendations on the funding model that can be adopted by ZINARA for road infrastructure development.

5.2 Conclusion

The research was based on “An assessment of the road infrastructure development funding model: A comparative case study of ZINARA and SANRAL”. The main objective of the research was on discovering funding models that are being used in South Africa that can be adopted and implemented by ZINARA (Zimbabwean) to improve its road infrastructure condition. The research first looked at international funding models used in some selected developed and emerging economies. The funding model review was further narrowed down to Zimbabwean and South African environments, with the objective of obtaining the current status quo.

Literature review broadly indicated that most of the models that are used in South Africa are being derived from international models. The main reason is that South Africa is a member of World Road Association where best practices of road funding and maintenance are prescribed. As a result of this observation from literature review, data collection was designed in such a manner for respondents to indicate both international and South African models for adoption by Zimbabwe. Data, facts and opinions was gathered through the use of questionnaires amongst government department and local authorities’ employees, in which the respondents were highlighting which both international and South African models can be adopted by Zimbabwe.

Empirical analysis of gathered data from respondents revealed that public financing, private financing, Public-Private Partnerships (PPPs) and infrastructure bonds are international models that can be adopted and implemented by ZINARA (Zimbabwe). However, since Zimbabwe’s benchmark for roads currently is South Africa much of the attention was given to statistical analysis of models used in that country. Data analysis indicated that Zimbabwe should consider adoption of national treasury, concessions through Public – Private Partnerships, capital market borrowings, direct loan investment and bank loans as funding models for better roads.

The research also looked for revenue turnover between ZINARA and SANRAL for the past seven years from 2009 to 2015. The data was obtained from published annual financial reports of both road funds. Statistical analysis of the data was done and presented in Chapter 4 and it revealed that SANRAL collects more revenue as compared to ZINARA. The reason SANRAL collect more is because of their revenue collection models.

5.3 Recommendations

The study recommends that:

Government of Zimbabwe

1. The government should fund the construction or rehabilitation of non-toll roads from the national treasury. These roads include those under the jurisdiction of local authorities and district development fund roads.
2. The government should explore concessions to private players to fund the construction of major state highways. Subsequent funds for maintenance of such roads should be generated from toll fees collections.
3. The government of Zimbabwe, should explore into Foreign Direct Investment into road maintenance sector. This can be the best option considering that most of Zimbabwe roads needs rehabilitation which requires billions of dollars.
4. The government should consider ring fencing revenue collected from city parking fees and vehicle licencing to maintain roads in jurisdiction where the vehicle is registered.
5. Innovative technologies – the government should clear the path to the marketplace for new technologies through an explicit, singular national research and development strategy that provides a strong link between the development and adoption processes, enhances the partnership between the national research community and the private sector.

ZINARA

1. To ease pressure on the treasury, ZINARA should explore capital market borrowings to fund for road infrastructure development. Where funding has been obtained from the market, the asset constructed should generated enough revenue for repayment of the borrowed funds.

2. ZINARA should explore bank loans for the financing of road related infrastructure like weighbridge to safeguard against overloading vehicles.

3. Also ZINARA can engage the private players i.e. Public Private Partnership to fund for:

Spot Maintenance - In view of present-day funding restrictions, sections that make the road impassable should be identified and be attended to in a “spot” maintenance approach. In subsequent years, normal maintenance and rehabilitation can and should resume when funds are available.

4. Output and Performance Based Contracts-Under this approach ZINARA define outputs and performance standards (level of service) required and contractor is responsible for meeting the required levels of service. Outputs can be kilometres of road completed, number of culverts cleared and gravel piled. This methods eliminates payment of hourly rate which is proving expensive to ZINARA due to old and obsolete equipment by contractors.

5.4. Future Research

The research focused on the funding models for road infrastructure development using a comparative case study of ZINARA and SANRAL. Future researchers may go further and analyse the effectiveness of those funding models given the economic conditions prevailing in Zimbabwe.

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7. APPENDICES:

APPENDIX A: ROAD FUNDING MODELS QUESTIONNAIRE

UNIVERSITY OF ZIMBABWE



TO WHOM IT MAY CONCERN

DEAR SIR

RE: QUESTIONNAIRE

My name is Anywhere Mudodo (student number R097407Y), a Masters in Accountancy student at the University of Zimbabwe. I am carrying out a research entitled: ***“Road Infrastructure Development Funding Models: A Comparative Case Study of ZINARA and SANRAL”***

I am kindly seeking your assistance in answering the following questions below basing on information relating to your organisation. The responses that you give will be kept confidential and will be used for academic purposes only.

Instructions

1. Please answer all questions
2. Be as objective as possible
3. All responses will be treated with strict confidentiality

SECTION A: DEMOGRAPHIC DATA

1. Gender

Male	Female
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2. Age Range

<20 Years	21-30 Years	31-40 Years	41-50 Years	51-60 Years	>60 Years
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3. Work Experience

0 – 5 Years	5- 10 Years	11-15 Years	15-20 Years	20-25 Years	>25 Years
-------------	-------------	-------------	-------------	-------------	-----------

4. Highest Level of Education

Below O' Level	O' Level	A' Level	Certificate	Diploma	Undergraduate	Postgraduate
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5. Position Level

Secretariat	Middle Management	Senior Management	Executive
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6. Marital Status

Single	Married	Widowed	Divorced
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7. Sector of the Organisation

Road Authorities	Please tick the appropriate
Department of Roads	
Rural District Council	
Urban Council	
District Development Fund	
ZINARA	

SECTION B: ROAD INFRASTRUCTURE FUNDING MODELS

1. The following international funding models are most appropriate for adoption in Zimbabwe.

MODEL	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Public Financing					
Private Financing					
Public-Private Partnerships (PPPs)					
The Regulated Asset Base (R.A.B)					
Public Sector Subordinated Funds					
Infrastructure Bonds					
Tax Incremental Financing					
Public Sector Minimum Guarantees					

2. The following South African models are suitable and can be applied in the Zimbabwean context to improve road infrastructure development.

MODEL	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Government appropriations or National Treasury					
Concessions through Public-Private Partnerships					
Capital Market Borrowings					
Direct Foreign Investment and loans backed by Export Credit Agency					
Bank Loans					

SECTION D: ROAD CONDITION SURVEY

1. How do you rate the road infrastructure status in your respective area of influence?

FACTOR	1	2	3	4	5	6
Surfaced Roads (Tarred)						
Gravel Roads						
Earth Roads						
Drainage systems						
Street lighting						
Bridges						

KEY:

1-Bad 2- worse 3-Worst 4-Good 5-Better 6-Best

2. If your answer is on ranking 1 to 3, briefly explain the causes of such a status?

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.....
.....
.....
.....
.....
.....

3. If your answer is on ranking 4 to 6, briefly explain the critical success factors for such status?

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.....
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.....

SECTION E: FUNDING MODELS

1. What were your sources of funding for road infrastructure development for the past five (5) years?

- i.
.....
- ii.
.....
- iii.
.....
- iv.
.....
- v.
.....

2. Are you satisfied with the existing funding model?

Yes

No

3. From the existing sources of funding, what other sources do you think should be considered to enable infrastructure to be maintained at the highest standard.

- i.
.....
- ii.
.....
- iii.
.....
- iv.
.....

SECTION F: FUNDING MODEL ADMINISTRATION

1. Do you believe the existing model of funding infrastructure development through ZINARA is working to your expectation?

Yes No

2. Does ZINARA involve you in any form or way when they allocate resources to you?

Yes No

3. Suggest any four (4) aspects that could be done by ZINARA to enable you to maintain or develop infrastructure to high standards.

- i.
.....
- ii.
.....
- iii.
.....
- iv.
.....

End of Questionnaire

Thank you for your time and effort

Appendix B: Approval Letter from ZINARA Management

To : Acting Chief Executive Officer

From : Acting Finance Manager (R097407Y)

Date : August 19, 2015

LETTER OF REQUEST TO UNDERTAKE A DISSERTATION USING YOUR ORGANISATION AS A CASE STUDY- Masters in Accountancy Program

As you are aware that I am studying Masters in Accountancy Degree with the University of Zimbabwe, and I am at a stage of conducting a research. I am proposing the following topic *“An assessment of the funding Model for infrastructure development a comparative case study of ZINARA and SANRAL”*. I believe that the outcome of this research will be beneficial to this organisation. Therefore, I am seeking your approval to proceed with this topic.

This research is aimed at identifying the gaps between ZINARA and SANRAL that could be useful in ZINARA’s funding model for road infrastructure development in Zimbabwe. The research may require me to compare the operating model of ZINARA and SANRAL as well as interviewing appropriate research participants. The research may require management support.

Your usual cooperation will be greatly appreciated

A.Mudodo

R097407Y

P. Murove (Approved/ Not Approved)

(Chief Executive Officer)