

**The effectiveness of public private
partnerships in the development of
road infrastructure: The case of toll
concessions in South Africa**

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DECLARATION

I, Thabo Borole, hereby confirm that this thesis: **“The effectiveness of Public-Private Partnerships in the development of road infrastructure: The case of toll concessions in South Africa”** is my own original work and that all sources used or quoted have been accurately reported and acknowledged by means of a complete bibliography, and that this thesis was not previously, in its entirety or partially, submitted by me or any other person for degree purposes at this or any other University.

DEDICATION

This study is dedicated to my late father and mother, Tjale and Grace Borole, who are the source of my existence and encouraged me to further my studies. To my late sister, Motshidisi Borole, you shaped my life, career and academic path.

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ABSTRACT

Since the introduction of public-private partnerships in South Africa's toll road subsector in the late 1990s, the government has had some degree of relief in the financing, designing, constructing, operating and maintenance of the infrastructure for the toll road concessions investigated (namely the N3, N4 and N1N4 toll roads). In ensuring that the forms of risks mentioned above are transferred to the concessionaires, the government adopted the design, construct, finance, operate and maintain (DCFOM) model, as this model protects the government against risk exposure. However, the findings show that the structure of the current model cannot remain the same if the existing concession contracts are extended or new private partners are found at the end of the current concession period. This study proposed a suitable model (improve, finance, maintain, operate and transfer (IFMOT)) for all three of the concessions examined. Under this model, the study developed a risk sharing structure of which the government and Concessionaires can share the design and finance risks on an equal basis and leave maintenance and operate risks at the hands of Concessionaires.

As the measures of best practices, transparency and accountability were found to be lacking by other stakeholders. This is because they want to determine whether the toll road concessions examined provide value for money. The concern raised was on how SANRAL and concessionaires conduct themselves when giving an account of their activities to the public, and the amount of information given to all other stakeholders. In terms of the oversight role on toll road concessions, it was discovered that the Standing Committee on Finance should support both the Portfolio Committee on State-Owned Enterprises and the Standing Committee on Public Accounts (SCOPA) in order to improve their oversight capacity on financial matters. The reason for this is that the executive authority, SANRAL and concessionaires are not being held accountable for their actions regarding the toll road concessions that were studied, especially on matters relating to finance (revenue, profit, expenditure, etc.), hence the inclusion of the Standing Committee on Finance. Another important factor established is that the SANRAL and National Roads Act, No. 7 of 1998, empowers SANRAL by giving it too much power. There is also a need to establish a dedicated traffic police to deal with traffic transgressions, crime and riots in order to reduce the workload of

South African Police Services and South African National Defence Force especially during protests along the toll road concessions being investigated.

Exploratory research was used to gain new knowledge about the toll road subsector, and participants were drawn from national government departments, state-owned enterprises, concessionaires, businesses, civil society groups, trade unions and political parties. The study is qualitative in nature and relied on both primary and secondary data. In terms of data collection, this study used interviews and open-ended (particularly semi-structured) questions were used. A large number of documents were also reviewed to assist in the capturing of important information in this research.

Keywords: public-private partnerships, toll road concessions, infrastructure, government agency, concessionaires, private partner, public sector, state-owned enterprises.

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LIST OF ABBREVIATIONS

ADB	African Development Bank
AET	All-Electronic Tolling
AGSA	Auditor-General South Africa
ALS	Area Licensing Scheme
ANC	African National Congress
ANE	Administração Nacional de Estradas
ATUC	Arab Trade Union Confederation
BOO	Build, Own and Operate
BOOT	Build, Own, Operate and Transfer
BOT	Build, Operate and Transfer
BPCC	Bakwena Platinum Corridor Concessionaire
BTO	Build, Transfer and Operate
CPA	Classical Public Administration
CPI	Consumer Price Index
CSIR	Council for Scientific Industrial Research
DB	Design and Build
DBB	Design, Bid and Build
DBF	Design, Build and Finance
DBFM	Design, Build, Finance and Maintain
DBFO	Design, Built, Finance and Operate
DBFOM	Design, Build, Finance, Operate and Maintain
DBM	Design, Build and Maintain
DBO	Design, Build and Operate
DBOM	Design, Build, Operate and Maintain
DBOT	Design, Build, Operate and Transfer

DCFOM	Design, Construct, Finance, Operate and Maintain
DDTH	Dakar Diamniado Toll Highway
DFBOT	Design, Finance, Build, Operate and Transfer
DSBFOMT	Design, Build, Finance, Operate, Maintain and Transfer
EFC	Electronic Fee Collection
EFF	Economic Freedom Fighters
ERP	Electronic Road Pricing
ETC	Electronic Toll Collection
EU	European Union
GFIP	Gauteng Freeway Improvement Project
IBRD	International Bank for Reconstruction and Development
IFF	Identification Friend or Foe system
IFMOT	Improve, Finance, Maintain, Operate and Transfer
IMF	International Monetary Fund
IPPR	Institute for Public Policy Research
ITC	Inland Transport Committee
LDO	Lease, Develop and Operate
MTC	Manual Toll Collection
N3TC	N3 Toll Concession (RF) Proprietary Limited
NDP	National Development Plan
NEMA	National Environment Management Act
NHS	National Health Service
NLTTA	National Land Transport Transition Act
NPG	New Public Governance
NPGN	New Potential Growth Nodes
NPM	New Public Management

NRB	National Road Board
NRF	National Road Fund
NSTPRSC	National Surface Transportation Policy and Revenue Study Commission
OECD	Organisation for Economic Cooperation and Development
ORT	Open Road Tolling
OUTA	Organisation Undoing Tax Abuse
PFMA	Public Finance Management Act
PIC	Public Investment Corporation
PPIAF	Public-Private Infrastructure Advisory Facility
PPPs	Public-Private Partnerships
QCA	Qualitative Content Analysis
RFA	Road Freight Association
RFID	Radio Frequency Identification
SA	South Africa
SAFTU	South African Federation of Trade Unions
SANDF	South African National Defence Force
SANRAL	South African National Roads Agency (SOC) Limited
SAPS	South African Police Services
SBA	Signal Breaking Avoidance
SCOPA	Standing Committee on Public Accounts
SCR	Sovereign Credit Ratings
SMMEs	Small-, Medium- and Micro-Enterprises
SOE	State-Owned Enterprise
SOPA	Gauteng State of the Province Address
SPLUMA	Spatial Planning and Land Use Management Act
SPV	Special Purpose Vehicle

TCP	Toll Collect Program
TPA	Traditional Public Administration
TRAC	Toll Road Concession, Trans African Concessions
UN	United Nations
UNDP	United Nation Development Programme
USA	United States of America
VFM	Value for Money
VOT	Value of Time
VTD	Vehicle Theft Detection
ZINARA	Zimbabwe National Roads Administration

CHAPTER 1

INTRODUCTION AND ORIENTATION

1.1 INTRODUCTION

The competing priorities placed on public authorities dictate that the public sector consider contractual partnerships with the private sector in order to address its mandate of delivering social infrastructure projects to citizens. It is a global experience that tight pressure on public budgets is a reason for the development of public-private partnerships (PPPs) (Marique, 2014:1). Most importantly, the assistance brought by PPPs should satisfy the most basic requirement, namely, provision of services to the public. Because PPPs are designed to increase the efficiency of social service delivery (Molokwane, Nduhura, Tshombe & Nyongarwizi, 2021:206).

Public-private partnerships are defined by Delmon (2011:2) as any contractual or legal partnership between public and private organisations aimed at improving and/or expanding infrastructure services, excluding public works contracts. The PPPs professionalise the relationship between the public authorities and private entities in that the functions, roles and responsibilities amongst both stakeholders are clearly defined. Lack of clarity concerning the contractual relationships of PPPs creates the following tensions amongst stakeholders:

- The first tension stems from the hybrid nature of PPPs, bringing together public and private players for the provision of the infrastructure or service concerned;
- The second tension concerns the long-term relationships established by PPPs and requiring adjustments as circumstances change; and
- The last tension refers to the polycentric problems of PPPs: PPPs affect multiple categories of people whose interests must be considered when entering and managing these schemes by public authorities (Marique, 2014:14).

In the context of South Africa's (SA) road infrastructure programme, the abovementioned information encourages that the functions, roles and responsibilities of the government and the private sector are clearly defined before entering into legal agreements (PPP) in order to minimise possible tensions. The aim of this study was

to assess the institutional function of the South African National Roads Agency (SOC) Limited (SANRAL) in the toll road concessions as a form of public-private partnerships. A concession involves the construction or renovation of an asset, such as a road, by a private party using private funding and, in some cases, the transfer of an asset from a public agency to a private sector partner (Mouraviev & Kakabadse, 2017:74). According to Marques (2010:Online), there is a direct connection between the private partner and the final client in the concession approach. The private partner offers a service to the public, in place of, but under the command of, the public authority.

In terms of the legal agreement of the N3 Toll Road concession, SANRAL is expected to oversee and monitor the following responsibilities as part of its institutional function (African Development Bank (ADB), 1999:1):

- Enlargement, rehabilitation and refurbishment of certain road sections;
- Realigning, specifically, certain existing provincial roads and access roads;
- Building new toll plazas;
- Building auxiliary works, such as bridges and drainage structures;
- Routine maintenance; and
- Toll road operation, including toll collection.

In the case of the N4 East Toll Road concession, SANRAL and the Administração Nacional de Estradas (ANE) of Mozambique entered into a PPP agreement to achieve the following objectives associated with the N4:

- Promote South Africa-Mozambique trade;
- Direct goods to Maputo Port and promote regional and international trade;
- Develop tourism in the region;
- Develop the region's main exporting sectors;
- Reduce transport costs by enhancing road effectiveness; and
- Encourage wider economic activity, empowerment and community growth in both nations (United Nation Development Programme (UNDP), 2006:3).

The abovementioned toll road concessions (N3 and N4) are important because they:

- Enable SANRAL to deliver roads sooner than using the tax revenue that would traditionally finance such roads;
- Deliver sooner than later the much-required infrastructure; and
- Ensure dedicated road maintenance funding (SANRAL, 2019:Online).

Since the toll road infrastructure concession in SA contributes tremendously to the economic growth of the country, it is important that it be preserved and maintained. Quality infrastructure has a positive impact on economic growth (Fourie, 2008:482). Furthermore, Choruma (2009) alludes that, as part of government policy, SANRAL is responsible for managing and controlling the road system for the Republic of South Africa as well as for the construction, maintenance, and repair of the national roads. This history of toll roads in South Africa has gained momentum, and SANRAL is currently in contractual partnerships with the following toll roads concessions, as shown in Table1.1 below:

Table 1.1: List of PPP Projects Concluded in South Africa

Project name	Government institution	Type	Date of close	Duration	Financing structure	Project value R million	Form of payment
SANRAL N4 East Toll Road	SANRAL	DFBOT	Feb-1998	30 years	Debt: 80% Equity: 20%	3 200	User charges
SANRAL N3 Toll Road	SANRAL	DFBOT	Nov-1999	30 years	Debt: 80% Equity: 20%	3000	User charges
SANRAL N1N4 West Toll Road	SANRAL	DFBOT	Aug-2001	30 years	Debt: 80% Equity: 20%	3 200	User charges
SANRAL Gauteng Freeway Improvement Plan Toll Road	SANRAL	DFBOT	Oct-2007	20 years	Debt: 100%	20 000	User charges

Source: National Treasury (2018:160)

In respect to Table 1.1, SANRAL has only entered into four contractual partnerships in terms of toll road concessions, and this study focused on the first three toll road concessions, of which the Gauteng Freeway Improvement Plan Toll Road (GFIP) was excluded due to the project's uncertainty, which will be discussed later in this study. Based on the information provided by the National Treasury in Table 1.1, the author deduced that all of the toll road concessions investigated (namely; N4 (East Toll Road), N3 Toll Road and N1N4 (West Toll Roads)) have been allocated 30-year contract periods, and the singular PPP model (design, finance, build, operate and transfer (DFBOT)) is utilised for all three. The DFBOT model was first introduced in the United Kingdom (UK), followed by Finland (Bousquet & Fayard, 2001:13).

However, according to SANRAL and the concessionaires (see par. 6.3.2.3(b) and par. 6.3.2.3(c)), the PPP model adopted for their concessions is the DCFOM model and not the DFBOT model, as established during the interviews. This gap exposes a lack of intergovernmental relations and co-operative governance amongst SANRAL (government agency), the Department of Transport (DoT) and National Treasury. Therefore, this study proposes a suitable model for these toll road concessions should the contracts be extended, or new private partners brought in at the end of the current concession period. This was achieved by asking SANRAL questions about the aims and objectives of the DCFOM model which is used in all of their toll road concessions investigated. According to Roberta, Dansohb and Kuragub (2014:1), concession models are adopted depending on the aim and objectives of the road agency.

The impact of the DCFOM model on SANRAL's institutional function was explored, and the identification of an alternative suitable model was conducted. According to the U.S. Department of Transport (2016:4-5), PPPs come in the following models: design and build (DB); design, build and maintain (DBM); design, build and finance (DBF); design, build and operate (DBO); lease, operate and maintain (LOM); design, build operate and maintain (DBOM); design, build, finance and operate (DBFO); design, build, finance, operate and maintain (DBFOM); build, own, operate and transfer (BOOT); build, own and operate (BOO).

1.2 ORIENTATION AND BACKGROUND

Hodge, Greve and Biygautane (2018:1105) assert that both the public and private sectors have a long history together, and that governments have mixed efforts with private enterprises for thousands of years. Therefore, public-private partnerships between a government and private entities are not new. These partnerships have existed long before the current era. Despite the modern enthusiasm for private finance and partnerships, historians were right when they said, 'The mixing of public-private endeavours is nothing new' (Wettenhall, 2005:22). It is now a norm for governments of the world to establish agencies that enter into contractual relationships (PPPs) with private entities on their behalf. Many developed nations, including Canada, the United Kingdom, Australia, Spain, France, Portugal, Italy, Greece and Ireland, have formed agencies which provide a comprehensive approach to private sector participation in infrastructure assets such as roads, ports, airports, power plants, water systems, public buildings, schools and hospitals. (Farrugia, Reynolds & Orr, 2008:5).

In 1999, South Africa followed the global trend for the popularity of PPPs by establishing a formal PPP structure within the National Treasury. Although PPPs existed before then, they did not follow a standardised process and were not formally recognised as PPPs (Walwyn & Nkolele, 2018:3). The standardisation and formalisation of PPPs began a paradigm shift that took-off in SA after the installation of the new democratic government in the 1990s. This led to a shift in the South African state's philosophy, from 'government' to 'governance', and new mechanisms such as concessions, PPPs and privatisation emerged (Burger, 2006:1).

As far as road infrastructure concessions are concerned, the first toll road construction schemes in France and Spain in the 1960s were financed by private consortia, mostly contractors and banks, and were a significant exception in Europe (Public-Private Infrastructure Advisory Facility (PPIAF), 2009:35). On the downside, in the Netherlands and despite high expectations, the formation of PPPs to develop transport infrastructure projects has stagnated (Koppenjan, 2005:135). While in the United Kingdom, with eleven PPPs for roads, one percent of infrastructure projects are completed earlier than scheduled (The American Magazine, 2019:Online).

According to Reed (2015:22), the bridges in the United States of America (USA) are crumbling, the roads are full of potholes and Congress will not adopt a comprehensive transportation funding plan. To ensure and preserve the quality of transport infrastructure, the congress in the USA should reach for common ground to expedite the funding of crumbling road infrastructure using PPPs. PPPs should play a major role in the financing and management of the surface transportation system in the USA (National Surface Transportation Policy and Revenue Study Commission (NSTPRSC), 2007:29) because the quality of transport infrastructure is a major determinant of transport costs and transit time costs (Nordås & Piermartini, 2004:6). In supporting the latter claim, Fourie (2006) argues that the term "infrastructure quality" refers to all performance-enhancing improvements, both in the infrastructure and the services delivered.

Lack of investment has become a major obstacle to the development of road infrastructure in China (Gan, Zhang, Hu and Liu, 2018:1). This investment dilemma has prompted the Chinese authorities to adopt the use of PPPs. The PPP model can alleviate financial pressure, improve the efficiency of the procurement of public goods and realise the sharing of risks between the public and private sectors (Gan et al., 2018:1). With respect to the institutional building, China's finance ministries have established PPP management entities at the national, provincial, municipal and county levels (BRICS, 2018:12).

The infrastructure deficit in Nigeria is appalling, particularly in the transport sector (Babatunde, Perera, Udejaja & Zhou, 2014:142). Llanto, Navarro and Ortiz (2015:30) state that low road density (infrastructure deficit) is common in developing economies. Some of the factors contributing to low road density in Nigeria are the perceptions of foreign investors regarding the high-risk economy of Nigeria, poor design and structuring of projects, an inability to divert vehicles to alternative routes, problems with land acquisition, lack of rigorous feasibility studies and project analysis, distrust between the public and private sectors, lack of professionals, and so on (Babatunde, Perera, Udejaja & Zhou, 2014:148-149). In an attempt to address some of these challenges, the government of Nigeria established the Infrastructure Concession Regulatory Commission (ICRC) in 2005, and then implemented the ICRC Act, which

provides for participation of the private sector in road and other infrastructure projects as PPPs (Olusola, Oluwatosin & Rufus, 2016:22).

In Senegal, the relocation of residents delayed and escalated the price for the rollout of the Dakar Diamniado Toll Highway (DDTH), which brought high-quality road infrastructure to Dakar. As with any 'greenfield' toll road, resolving right-of-way (ROW) issues is important but also increased the cost of DDTH construction to \$265 million, as well as the resettlement cost of \$158 million (Brocklebank, 2014:42).

The aforementioned information reflects the complexities regarding the completion schedule for PPPs on toll road concessions, since every project is different in terms of location, scope, budget, structure, terms and conditions. The history of toll roads in South Africa dates back to the 1700s, when the Cape Colony's governor collected toll fees for road repairs. Until the 19th century, tolls were collected on roads in the former provinces of Natal and Orange Free State (SANRAL, 2009). Today, SANRAL has an enormous number of road networks to manage in SA. To illustrate this, the map below shows all of the roads managed by SANRAL, including the toll road concessions previously mentioned in Table 1:1.



Source: Google (2021:Online)

Figure 1.1: South African Toll Roads

Grimsey and Graham (1997) and the National Health Service (NHS) (1999) posit that in some cases, the public sector must establish a special agency capable of entering into partnerships before co-operation becomes possible. In the context of SA, SANRAL is expected to form partnerships with agents and monitor their activities. Monitoring refers to the ability of the principal to determine whether the agents complied with the provisions of the contract and to avoid misuse of assets by the agent arising due to conflicts of interest (Landstrom, 1993:206).

It is already indicated above that this study focused on N3, N4 and N1N4 toll road concessions, and excluded the GFIP due to the project's uncertainty. Therefore, in terms of the N3, N4 and N1N4 toll road concessions, the South African government established SANRAL as the institution (government agency) that entered into

contractual partnerships (30-year toll road concession contracts) with all three of them. In the case of N3 toll road concession, SANRAL entered into contractual agreement with N3 Toll Concession (RF) Proprietary Limited (N3TC), which took effect on the 2nd of November 1999. According to the Public Investment Corporation (PIC) (2018:Online), the shareholding structure for N3TC (agent or concessionaire or private sector partner) is as follows: GEPF owns 39.85%, AIIF holds 10.98%, Futuregrowth owns 18.80%, OMLACSA (Ideas) has 19.37%, Steemetals hold 10.92% and Others own 0.08%.

Wheels24 (2017:Online) notes that the work on the N3 route began in 1961 with the first of twelve sections starting between the cities of Durban and Pietermaritzburg and would continue for four decades as the road was widened. The last section of the route was completed in 2001 between the towns of Villiers and Heidelberg.

According to the contents of the concession agreement signed by both parties (SANRAL and N3TC), N3TC is assigned the mandate of designing, constructing, financing, operating and maintaining the N3 route. Therefore, the concession agreement is the main contractual document outlining the parties' rights and obligations under a PPP arrangement (Nwangwu, 2016:68). The overarching model for the N3 toll road is the DCFOM model (N3TC absorbs the risk), which is expected to last for 30 years and runs between De Hoek Plaza in the Gauteng province and Mariann Hill Plaza in the KwaZulu-Natal province. The conceptual starting point for designing a PPP in a concession-type structure is for the private entity to be accountable for, and to bear all risks for finance, investments, operations, invoicing and collection (World Bank, 2011:29). A usage charge (toll fees) is a source of payment made to N3TC based on the contents of a concession contract and this minimises the government's risk. A private company charges user fees (tolls) to recover its investment and operating expenses (Mouraviev & Kakabadse, 2017:74).

In the context of the N4 East Toll Road concession, Trans-African Concessions (TRAC) (the agent or concessionaire or private sector partner), was appointed in 1997 and became the critical player in a 30-year concession contract with the government agencies, SANRAL and ANE (TRAC, 2019:Online). TRAC is expected to maintain and rehabilitate the N4 route to high standards since this route fosters economic and tourism activity between SA and Mozambique. The Maputo Development Corridor

(MDC) Project includes the rehabilitation of the N4 East Toll Road concession, which extends from Johannesburg in South Africa, to Maputo, the capital city of Mozambique (UNDP, 2006:2). The DoT in South Africa created SANRAL and the Mozambican Department of Roads and Bridges (DNEP) created the ANE. These serve as the government authorities for each country to oversee and provide public management for the N4 East Toll Road (UNDP, 2006:4).

The Bakwena Platinum Corridor Concessionaire (BPCC) is responsible for the eighty-five-kilometre stretch of the N1 route between Pretoria and Bela (Warmbaths), which also connects the N4 route from Witbank's Proefplaas interchange with the N4 Platinum Toll Road to Botswana's Doornpoort interchange. Bakwena also manages 352 kilometres of the tolled section of the N4 highway to the west of Pretoria, from the N1 interchange to Lobatse (Skilpadhek) on the Botswana border, and passes through Brits, Rustenberg, Groot Marico and Zeerust (Bakwena Platinum Corridor Concessionaire, 2019:Online). The funding structure for the Bakwena Platinum Corridor concession for the N1N4 route is as follows:

- African Infrastructure Investment Fund 2 (AIIF2);
- Kagiso Infrastructure Empowerment Fund (KIEF);
- IDEAS Managed Fund; and
- South Africa Infrastructure Fund (SAIF) (exited 62% indirect holding in 2016).

The Gauteng Freeway Improvement Project (GFIP) will inject roughly R29 billion into the South African economy and roughly R13 billion into the provisional gross geographic product, creating nearly 30 000 direct jobs over its life cycle (National Road Agency (NRA), 2009:Online). The highway system was chosen as part of the GFIP plan to be financed by e-tolling (electronic tolling) which enables tolls to be collected without vehicles having to stop or slow down in multiple lanes (SANRAL, 2009).

In the case of the GFIP, the leadership failed to defend the speculations made about the long-term sustainability of a sufficient amount of funding in a designated fund as being important to the planning and implementation of the road network. Moreover, during the planning of this network, the public sector was not consulted, with the result being that motorists and other interested parties refused to register for the e-toll scheme (Matsiliza, 2016:5). The protracted battle with the Organisation Undoing Tax

Abuse (OUTA) and other stakeholders over the e-tolling prompted the Premier of Gauteng to advocate for the scrapping of this project (Gauteng State of the Province Address (SOPA), 2019).

Based on the above information, SANRAL should uphold its end of the bargain to address its institutional function, and the agents should do the same to fulfil their contractual mandate. The PPP concession may result in either party terminating the contract due to a serious infringement of the contract (Nwangwu, 2016:64). It is therefore practically impossible to avert contractual disputes and tensions in a long-term partnership, especially where the principal transfers the risk of the project to the agent. Such is the case in the four toll road concessions mentioned previously. Changes occur during the course of any long-term relationship. A PPP is above all a partnership and needs to be tailored to any challenges, changes and resolutions (Delmon, 2011:5). These contractual triggers of the PPP model usually lead to contractual disputes and tensions that occur due to the following:

- The contractual structure of PPP projects and how risk allocation can be assisted;
- During the procurement process, it is necessary to identify and assign risks;
- The techniques used to allocate and control risk under the project agreement; and
- Risk reduction within the consortium structure (Walsh, 2003:163).

It is against this background that a skewed concession agreement (with unjust risk allocation), has the ability to disadvantage one partner in the road infrastructure concession. This has the potential to derail or hamper the social service delivery agenda. The PPP agreements (road infrastructure concessions) must co-ordinate the interests pursued by each partner, i.e. the interests of the public and the economic interests of private contractors (Marique, 2014:100), instead of imposing long-term rigid contracts (Cruz and Marques, 2013:vii).

In terms of the consortium structure and risk transfer, SANRAL's institutional function is set out by the Public Finance Management Act, No.16 of 1999 (PFMA). This Act refers to "institutional function" as a service, task, assignment or other function that an institution performs:

- i. in the public interest; or
- ii. on behalf of the public service generally.

Based on the aforementioned, SANRAL is expected to execute its institutional function mandate diligently on all of its toll road concessions by ensuring that the value for money (VFM) principle is adequately applied. In achieving its institutional function for the benefit of the public at large, SANRAL should exhibit high-level management that is equitable, fair and demonstrates democratic tendencies. Section 217(1) of Chapter 13 of the Constitution of South Africa of 1996, asserts that when an organ of state in the national, provincial or local spheres of government contracts for goods or services, it must do so in accordance with a system which is fair, equitable, transparent, competitive and cost-effective. This section purports that during the rollout process of toll road concessions, SANRAL should not unfairly compromise the agents as a result of the skewed contractual agreement.

In understanding the service, task or assignment that forms part of the institutional function of SANRAL, it is important to read Schedule 4 and 5 of the Constitution of South Africa of 1996 together. These schedules reduce the ambiguity regarding the institutional function mandate and the competence placed on SANRAL, since they are expected to liaise and work together with various stakeholders such as businesses, non-profit organisations, communities and the national, provincial and local spheres of government.

1.3 PROBLEM STATEMENT

Public-private partnerships are a simple method for many countries to use for infrastructure development. Fourie (2008:493) asserts that poor infrastructure quality leads to increased trade costs by restricting exports, a constraint that could worsen the performance of South African exports in the foreseeable future. The mode of transport for large, uniform freight travel, accounts for 69% of all freight transport activity (measured by ton kilometres), which puts strain on a road network that already has significant maintenance backlogs which contribute to unsafe road conditions (National Development Plan (NDP), 2012:184). Approximately 94% of road networks are assigned to SANRAL in SA, and they have the responsibility for overseeing these maintenance backlogs. SANRAL is responsible for improving, maintaining and

managing 94% of South Africa's 22,214 kilometres national road network, while the remaining 6% of the network is managed through PPPs by means of 30-year concessions on various national toll routes (SANRAL, 2018:24).

The toll road concessions investigated fall within this 6%, and the periodic maintenance by SANRAL and concessionaires should reduce the catch-up costs significantly. The problem is that maintenance costs become more significant over the lifetime of a road if neglected, resulting in exponentially higher catch-up costs (Wirtz, 2009:36). The burden of project costs, which includes maintenance costs, and the risk-sharing (i.e., political, collection and tariff risks) on the toll road concessions, has the potential to strain the legal relationship between SANRAL and concessionaires, especially in this case, where the DFBOT model (risk absorption is placed on the concessionaires) has been adopted. One of the major aspects in the success of a PPP project is appropriate risk-sharing, and as a result, private partners must accurately identify risk factors and react to risk management measures in a timely and reasonable manner (Gan et al., 2018:2). These intricate, contentious and pertinent issues such as the burden of project cost and risk-sharing, form part of the DFBOT model and open the door for contract renegotiation.

Table 1.2: Public-Private Partnership Renegotiation Trends Across Sectors

Sector	Percentage of renegotiated PPP	Average time to renegotiation
All sectors	68%	1.0 years
Electricity	41%	1.7 years
Transport	78%	0.9 years
Water	87%	0.8 years
Social Sector	39%	1.2 years
Other Sectors	35%	1 year

Source: Guasch, Benitez, Portabales and Flor (2014:7)

According to the information provided in the table above, the road infrastructure sector is the second highest (78%) in terms of renegotiating the contractual terms and conditions, which is mostly due to the model the DCFOM model that was adopted.

Contractual triggers without renegotiation result in unilateral changes to the investment plan, operating conditions, service quality levels or any other variation to what is stated in the initial contract, the responsibility of which is not assigned to the concessionaire in the risk matrix (e.g. new legislation) (Cruz et al., 2013:132).

In benchmarking the DCFOM model used for the toll road concessions investigated according to international standards, the following good practices should be adhered to, as prescribed by BRICS (2018:5-6):

- Government support;
- Regulatory framework;
- Institutional arrangement;
- Incentive measures; and
- Project management.

According to the above information, government support for concessions will reduce the contractual disputes (such as a risk-sharing framework, governance issues, etc.) arising from the DCFOM model, and a regulatory framework will clarify issues around contract management, procurement, fiscal affordability assessment, value for money evaluation, roles and responsibilities. Project management principles such as transparency, unified project operation process, etc., should be implemented in the DCFOM model to minimise the management and operation challenges faced by the concessionaires.

PPPs are often conducted on an opportunistic basis in South Africa which limits the extent to which they can be used effectively in any sector (Castelia Strategic Advisors, 2007:4). These opportunistic contractual clauses (based on the DCFOM model) which are contained in the concession agreement (between the government agency and private partner), often delay the project, which increases the project's costs. Despite the efforts of the project managers at the SANRAL regional offices to work with contractors to avoid or minimise delays, delays were experienced on a large proportion of projects (SANRAL, 2018:26). The skewed terms in the DCFOM concession contract between SANRAL and concessionaires, allow the concessionaires to develop procedures which:

- Enable unsolicited proposals to be submitted and clarify how they are evaluated; and
- Reimburse project creators for their efforts to create viable projects (Castelia Strategic Advisors, 2007:9).

According to the above information, the concessionaires as private partners are not given the opportunity to originate and advance the PPPs by taking part in the evaluation of proposals to assist in originating viable projects. This exclusion indicates that the terms of the concession agreement of the DCFOM model are not mutual. Long-term projects generally require a mutual contribution of resources, which is why they are implemented jointly by both the parties, since each party is unable or unwilling to undertake a project on its own due to the high risk and/or excessive costs associated with long-term activities (Mouraviev & Kakabadse, 2017:5). These risks are classified as follows:

- Political;
- Commercial;
- Legal;
- Relationship;
- Planning and procurement;
- Construction;
- Operating and maintenance; and
- Force majeure (Thieriot & Dominguez, 2015; Lossa, Spagnolo & Vellez, 2013).

From the above risk classification, the nationalisation of assets and public and political opposition can pose a threat to the completion of a toll road concession. Other factors, such as tariff changes, fluctuations in interest rates, inflation, change in laws, lack of commitment from government or a private party, improper designs and specifications, construction changes, lack of supporting infrastructure, geotechnical conditions, wars and natural disasters all form a part of the risk classification and have a direct bearing on the DCFOM model of the toll road concessions investigated.

According to the Auditor-General of South Africa (AGSA) (2018:79), SANRAL has been vulnerable four times over the four-year period with a deficit of R260 million. This deficit is a significant reduction in losses from R4.96 billion in the previous year. However, this does not exonerate SANRAL from executing its institutional function diligently. The situation is further exacerbated by the GFIP which had a direct bearing on the toll road concessions investigated. The AGSA stated that the material uncertainty regarding the ability of SANRAL to continue as an ongoing concern was indicated in the notes on the financial statements of SANRAL, that its funding strategy for the next 12 months, relating to toll operations, depended on a cabinet decision on the e-tolls as they relate to the GFIP (IOL, 2018:Online).

The purpose of this study was to investigate the effectiveness of PPPs for improving the road infrastructure in South Africa. All three toll road concessions investigated use the DCFOM model as a means for improving road infrastructure. Therefore, this study proposed a suitable model for the toll road concessions examined should the concession contracts be extended or new private partners brought in at the end of the current concession periods. Under the proposed model, this study advocates for sharing the design and finance risks as a means to solve some of the challenges mentioned above.

1.4 RESEARCH QUESTIONS

The primary research question:

- How effective are the PPPs for improving the road infrastructure in South Africa?

The secondary research questions are as follows:

- i. What are the challenges facing SANRAL and concessionaires regarding the toll road concessions under investigation in terms of the PPP model currently in use?
- ii. What are the best practices for toll road infrastructure that SANRAL can adopt?
- iii. What is the nature of the contractual agreement that regulates the partnership between SANRAL and the concessionaires on the toll road concessions under examination?

- iv. What could be a suitable model for the toll road concessions going forward?

1.5 OBJECTIVES OF THE STUDY

The primary objective of the study is:

- To assess the effectiveness of PPPs for improving the road infrastructure in South Africa.

The secondary objectives of the study are:

- i. To identify the challenges facing SANRAL and concessionaires regarding the toll road concessions under investigation in terms of the PPP model currently in use.
- ii. To review the best practices for toll road infrastructure that SANRAL can adopt.
- iii. To examine the nature of the contractual agreement that regulates the partnership between SANRAL and the concessionaires on the toll road concessions under examination.
- iv. To propose a suitable model for the toll road concessions going forward.

1.6 CENTRAL THEORETICAL STATEMENT

By taking into consideration the problem statement, research questions and objectives of this thesis, the following central theoretical statements are made regarding the effectiveness of PPPs for the development of road infrastructure in SA:

- i. PPPs have become the solution for overcoming public budget constraints while enabling the use of private sector expertise for the delivery and management of public services (Marques, 2013:1).
- ii. Sufficient traffic volumes to make a project viable for the private sector and a comprehensive economic and financial analysis of the project indicates that it will benefit society and that it is commercially viable for the potential concessionaire (World Bank, 2004).
- iii. A PPP is a commercial transaction between an institution (defined as including departments, constitutional institutions and public entities) and a private party performing an institutional function on behalf of the public institution (Public Finance Management Act, No. 16 of 2005).

From the above statements, it is appropriate that this study adopted the new public management theory, new public governance theory, and principal-agent theory. The principal-agent theory was used because the National Treasury (principal), through SANRAL, has contracted N3TC, TRAC and BPCC (agents) to manage the toll road concessions that are project-based PPPs.

1.7 SIGNIFICANCE OF THE STUDY

Fawcett and Pockett (2015:121) posit that most researchers are confident that their research findings will be significant and make an impact as a result of their exploration and investigation of a particular problem or issue of concern. This study proposes a suitable model for all three of the toll road concessions investigated (N4 East Toll Road, N3 Toll Road and N1N4 West Toll Roads) which can be used should these concession contracts be extended or new private partners are brought in at the end of the current concession period. This exercise was undertaken to maximise the improvement of the toll road concessions in SA, institutional function assigned to the government agency SANRAL. SANRAL's function regarding the toll road concessions is hamstrung by risk-sharing and contractual disputes with agents. This is due to the DCFOM model which is used in all three of the toll road concessions investigated. Therefore, for SANRAL to perform its institutional function diligently, the long-term contractual agreement should be mutual, fair, individualised, and be able to renegotiate the terms of risk, which this study will address.

It has been gathered that there is no existing study conducted on the institutional function of SANRAL regarding road infrastructure in SA. It is therefore expected that this study contributes to the current body of knowledge with respect to PPPs.

1.8 RESEARCH METHODOLOGY

Research methodology is the branch of knowledge concerned with methods (Punch, 2016:65). To determine how SANRAL can effectively perform its institutional function with regards to the toll road concessions investigated, the research methodology was used as the roadmap to guide this study. To achieve this, the qualitative research method was used. The most fundamental definition of qualitative research is that words are used as data, gathered and then analysed in many ways (Braun & Clarke, 2013:3). This is achieved by interviewing the participants and the documentary

analysis data collection in the case of this study. The qualitative research method was used at the start of this study to generate ideas for the semi-structured interviews. Data collection procedures require interviews and document analysis in qualitative research (Creswell, 2014:190). Below are some of the characteristics of qualitative research:

- i. Natural setting: qualitative researchers tend to gather field information at the site where respondents experience the issue or problem being studied;
- ii. Researcher as a key instrument: qualitative researchers obtain information on their own through document review, behaviour observation and participant interviews;
- iii. Multiple sources of data: qualitative researchers typically collect various data types, such as documents, observations and interviews, instead of relying on a single source of information;
- iv. Inductive data analysis: qualitative researchers construct their categories of patterns and themes from “bottom-up” by organising increasingly abstract data units; and
- v. Participants’ meanings: throughout the qualitative research process, researchers concentrate on studying the significance of the problem or issue that the respondents hold, not the meaning that the researchers introduce to the study (Creswell, 2007:37-39).

From the above it can be deduced that qualitative research requires the researcher to be on the road doing fieldwork (collecting data) by conducting interviews, observing behaviour and examining documents. The researcher reserves their opinion and embraces that of the respondents to better understand the context, and this takes the form of a bottom-up approach.

1.8.1 Research Design

According to Creswell (2009:5), a research design is a plan or proposal for the research that incorporates philosophy, investigation or inquiry using particular methods. The plan to conduct this research involved analysing documents to generate new ideas and to better understand the challenges of the phenomenon and this assisted to formulate the relevant questions later asked in the study. These questions

took the form of semi-structured interviews and the main respondents were SANRAL, the National Treasury (PPP Unit), the Department of Transport, TRAC, N3TC and BPCC.

1.8.1.1 *Exploratory Research Design*

Exploratory research design aims to gain new insights, find new ideas and increase knowledge of the phenomena being studied (Burns & Grove, 2001:374). Exploratory research design was used in this inquiry to investigate an issue that is not clearly defined and to highlight the core of the problem. Importantly, exploratory research design clarifies and defines the nature of the problem, it does not provide conclusive evidence, it encourages subsequent research, it is not rigorous, it encourages the use of small sample sizes, and the results may lead to your next study (Swanson, 2015:16).

According to the above, exploratory research design clarifies the nature of the problem by collecting either primary or secondary data and interpreting it. This research design accommodates the use of a small sample size, as was used in this study, and the results are expected to trigger further research. Most importantly, these results should be based on the conditions of interest and explore the challenges. The primary priority of exploratory research is to determine the limitations of the setting or environment in which the challenges, possibilities or conditions of concern are most likely to exist, as well as the significant factors or variables that may be uncovered and are pertinent to the studies (Van Wyk, 2019:Online).

Punch (2016:81) denotes that qualitative data improves and explains results by delving deeper into exploring the views of the participants. Therefore, the results of this study are useful to delve deeper to have an in-depth understanding of the research problem. SANRAL's institutional function is the focus for the unit of analysis.

1.8.2 Literature Review

In contributing to the improvement of the toll road concessions as a form of PPPs, the literature review for this study consisted of relevant secondary information. Bordens and Abbott (2008:63) describe a literature review as the process of locating, collecting,

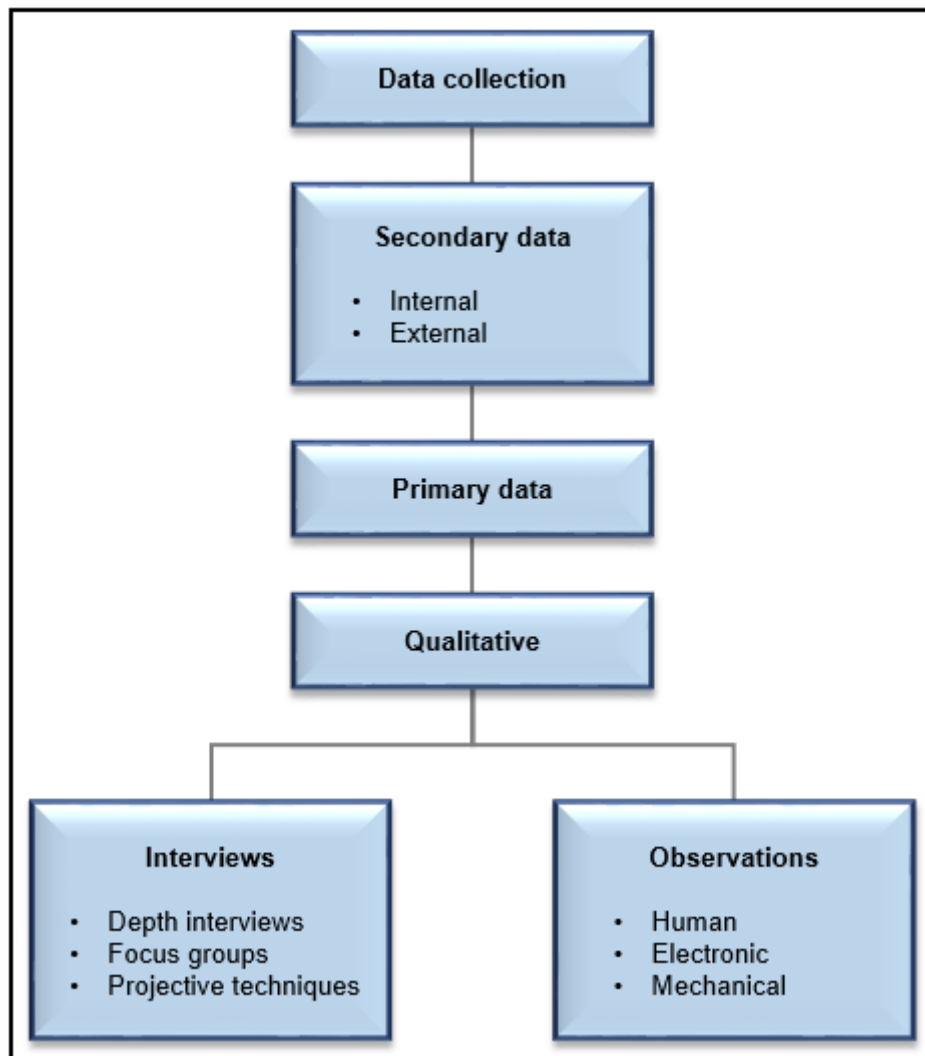
reading and assessing research literature in a specific field of interest. The following SA government documents were obtained for this study:

- i. National Treasury PPP Unit 2007, Introducing public-private partnerships in South Africa;
- ii. National Treasury PPP Unit Date 2007, Municipal Service Delivery and PPP Guidelines;
- iii. National Treasury PPP Unit 2004, PPP Practice Note;
- iv. National Treasury PPP Unit 2004, Standardised PPP Provisions;
- v. National Treasury, Public Finance Management Act, 1999: Treasury Regulation 16;
- vi. South African National Roads Agency Limited South African. 2018. Integrated Report Volume 1;
- vii. South African National Roads Agency Limited South African. 2018. Integrated Report Volume 2: Corporate Governance and Financial Statements; and
- viii. South Africa (SA). 2012. National Development Plan 2030.

The textbooks relevant to the study were obtained from the North-West University libraries (Potchefstroom (Ferdinand Postma Library) and Vaal Triangle campuses), and where necessary, the Inter-Library facility was used. The EBSCO host (i.e., Econolit, Academic Search Premier, etc.) was used to avert plagiarism, and other databases such as Nexus, Index of South African Periodicals, Google Search and the catalogues of theses of South African Universities, formed part of the resources and materials used for this study. The international perspective needed for the scope of this study was located and obtained using international agencies such as the International Monetary Fund, United Nations, World Bank, etc.), for publications, reports, journals and articles. The literature review provided insight into how the researcher could restrict the scope of the study to a required area of investigation or inquiry (Creswell, 2009:23).

1.8.3 Data Collection

The majority of research questions are solved by integrating primary and secondary sources of data (Saunders, Lewis & Thornhill, 2003:189). Therefore, this study used a combination of primary and secondary data.



Source: Hair, Money, Samouel and Page (2007:192)

Figure 1.2: Primary Data Collection Methods

According to Figure 1.2 this study is theory verification research. The purpose of this structure is for development. The study was conducted in phases, with secondary data from the first phase being gathered, analysed and utilised to produce the primary data for the second phase.

1.8.3.1 Qualitative Data Collection Method

a. Semi-Structured Interviews

Researchers are free to exercise their own initiative in a semi-structured interview and are able to achieve this by following up on an interviewee's answer to a question (Hair et al., 2007:197). The researcher conducted three interviews with personnel from both the National Treasury (PPP Unit) and the Department of Transport to seek clarity

on matters pertaining to the regulations and policies for PPPs used in the toll road concessions.

Additionally, four interviews were undertaken with representatives from SANRAL, N3TC, TRAC and BPCC on matters relating to operational requirements. The researcher also conducted interviews with members from the Organisation Undoing Tax Abuse (OUTA), the Road Freight Association (RFA), the African National Congress (ANC), the Economic Freedom Fighters (EFF), and the South African Federation of Trade Unions (SAFTU) to extract their views, opinions and feelings in relation to the institutional function that SANRAL performs regarding the toll road concessions as investigated for this study. Interviews are particularly helpful to get the story behind the experiences of a participant (McNamara, 1999).

b. Document Analysis

Document analysis is a method for reviewing and evaluating documents, both printed and electronic material (computer-based and internet-based) (Bowen, 2009:29). Various documents regarding the toll road concessions investigated were used to achieve a better interpretation of the research subject. Bowen (2009:32) further asserts that document analysis combines components of content analysis and thematic analysis and entails skimming (superficial investigation), reading (thorough examination) and interpretation.

Content Analysis

Downe-Wambolt (1992:314) defines content analysis as a method of research that provides a systematic and objective means of making valid inferences from oral, visual or written data to describe and quantify specific phenomena. Schreier (2012) denotes that content analysis is systematic because all relevant resources are considered, a procedure of phases is followed during the analysis and the coding must be reviewed for consistency. According to Elo and Kyngäs (2008), Morgan (1993) and Weber (1990), this is achieved by creating categories, concepts, models, conceptual systems or conceptual maps. Content analysis is the process of organising information into categories related to the research's central questions. Therefore, the process of organising information into categories related to the research's central question is known as content analysis (Bowen, 2009:32).

The qualitative content analysis (QCA) used in this study is inductive. The inductive (conventional) QCA is used if previous theories or studies' findings are lacking or restricted (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005; Mayring, 2000). Creswell (2007:38) states that in inductive content analysis the qualitative researchers construct their categories of patterns and themes from the "bottom-up" by organising more abstract data units. In this study the inductive content analysis processes used the following three critical phases, namely:

- Preparation;
- Organisation; and
- Results reporting (Elo et al., 2008).

It is against this background that data from these three main phases are presented in words. Data are presented in words and themes when using qualitative content analysis, enabling one to interpret the results (Bengtsson, 2016:10).

Thematic Analysis

Emerging themes become the categories for analysis in thematic analysis, which is a type of pattern recognition within the data (Fereday & Muir-Cochrane, 2006). In simplifying the analysis, the researcher will organise data into themes that follow particular patterns, categories and codes. Themes are patterns across the data set that are important for describing the data attributes of a research subject. Boyatzis, 1998; Sutton and Austin, 2015, posit that the term "theming" refers to the process of creating codes from one or more transcripts to present qualitative research findings in a logical and meaningful form.

According to Braun and Clarke (2006), a thematic analysis consists of six phases, namely reading the collected data, coding the data, searching for themes among codes, examining themes, analysing themes and summarising findings. Scharp and Sanders (2018:2) explain these six phases as follows:

- Becoming familiar with the data includes transcription or (re)reading the data;
- Generating codes requires the systematic marking of interesting data features within the data collected;

- The generation of themes requires the researcher to collect initial codes into potential themes, collecting all data relevant to the particular theme;
- The theme review process entails checking whether the themes work in relation to the coded extracts and the entire data set;
- To define and name the themes comprises of determining the core of what each theme conveys: to know what it is and what it is not; and lastly
- Locating exemplars requires the researcher to select compelling examples that provide evidence of the theme and that relate to the research question.

According to the above, weaknesses in the collected data can be easily identified because the researcher conducts an in-depth analysis of the data collected. This analysis was conducted by long hours of categorising, coding of themes and reading.

1.8.4 Population and sampling

1.8.4.1 Population

Collis and Hussey (2014:197) describe a population as a group of people or a collection of items being studied for statistical purposes. In conducting this study, the researcher organised people according to various sets and represented these sets in a statistical data form. A population is a finite set of people being studied (Groves, Fowler, Couper, Lepkowski, Singer & Tourangeau, 2009:44).

The qualitative approach was used for this study to collect data on the targeted population in the form of semi-structured interviews and documentary analysis. The population in this study consisted of personnel from the National Treasury (PPP Unit), the Department of Transport, SANRAL, N3TC, TRAC, BPCC and other stakeholders such as the ANC, EEF, SAFTU, RFA and OUTA.

1.8.4.2 Sampling

The selection of a subset of a population for participation in research is known as sampling (Daniel, 2012:1). In respect to this study, qualitative sampling was used. Qualitative sampling is more purposeful and directed at involving participants who are likely to have something to say about the area being investigated (Fawcett et al., 2015:52).

It is important to indicate that this study utilised non-probability or non-random samplings, namely convenience and purposive sampling, over probability sampling despite their shortcomings. Non-probability sampling strategies are any sampling methods that do not use any form of random selection (Jager, Putnick & Bornstein, 2017:3).

A. *Purposive Sampling (Judgement or Deliberate Sampling)*

For the most efficient use of limited resources, purpose sampling is a technique widely used in qualitative research to identify and select cases that are rich in information (Patton, 2002). The researcher will identify and select the areas that need to be known based on the information available to him and target the participants with the necessary knowledge to participate in the study. In terms of purposive sampling, the researcher decides what needs to be known and identifies people who are willing and able to provide information based on their knowledge or experience (Bernard, 2002; Lewis & Sheppard, 2006). For this study, the following purposive sampling methods were used to source and extract information from participants by means of interviews (Etikan, Musa & Alkassim, 2016:3).

Expert Sampling

Experts from various government departments, principals (state-owned enterprise SANRAL) and agents (N3TC, TRAC & BPCC) participated in this study. Two officials from the National Treasury and one from the Department of Transport were interviewed to get their perspectives on matters relating to the legislation regulating PPPs for road infrastructure projects. One official from SANRAL and one from N3TC, TRAC and BPCC respectively were interviewed to extract their views on matters relating to the nature of contractual agreements and the challenges faced by both the principal and agents with regard to the existing PPP model. A total of seven officials were interviewed.

Maximum Variation or Heterogeneous Sampling

For this study to yield accurate results on the subject being investigated, the researcher gathered a variety of participants to represent all views. In this instance, one member each from the ANC, EFF, RFA, OUTA and SAFTU were interviewed as

representatives of end-users (motorists), businesses, politics and workers. The total number of representatives from the above was five.

b. Convenience Sampling (Accidental or Haphazard Sampling)

Jager et al. (2017:3) state that since the generalisability from convenience samples is unclear, convenience sample estimates are often biased. Despite this imperfection, this study necessitated the use of convenience samples because of the availability of the targeted population. In most cases, not every subject can be included because the population is nearly finite, so most researchers use convenience sampling (Explorable.com, 2009:Online).

The most typical justification to use non-probability sampling is because it is less expensive than probability sampling and can be implemented more quickly (Battaglia, 2008). The availability of the targeted population and the vastness of the toll roads being investigated, compelled the researcher to employ convenience sampling since the OUTA and SAFTU members' views and experiences had to also be considered (diversity) (see par: 8.7.1.2). This was a cheaper way to collect the views and experiences of the participants. The convenience sampling approach may be used in both qualitative and quantitative studies, although qualitative studies often use purposeful sampling (Explorable.com, 2009).

1.8.5 Validity

The extent to which a construct measures what it is supposed to measure is referred to as validity (Hair et al., 2007:246). In this study, validity was achieved using the information below.

1.8.5.1 Validity in qualitative (trustworthiness, rigour, credibility)

Leung (2015:Online) posits that in qualitative research, validity refers to the instruments, procedures and data as being "appropriate". Therefore, it was necessary to ensure that the validity of the method used in this study was appropriate in order to get an in-depth understanding of a particular situation and interaction (rigour) using the relevant processes. A qualitative study's rigour attempts to comprehend a specific circumstance, event group or interaction, and this entails an investigative procedure

in which a researcher attempts to make sense of a social phenomenon by comparing, replicating, cataloguing and classifying the study's objects (Creswell & Miller, 2000).

This study ensured that findings were worth considering and relevant. In a qualitative inquiry, the objective of trustworthiness is to support the argument that the findings of the inquiry are "worthy to pay attention to" (Lincoln & Guba, 1985). To justify the involvement of participants in this study, the researcher ensured that the results are acceptable by reflecting on participant's responses fairly. Establishing that qualitative research results are credible or acceptable from the participant's perspective forms part of the credibility requirements or criteria (Web Center for Social Research Methods, 2019:Online). In support of this, Polit et al. (2012) allude that the focus of the research is on credibility, and that credibility refers to the confidence in how well the data addresses the intended focus. In closing, Joppe (2000:1) states that validity establishes whether or not the research truly measures what it was designed to measure, as well as how accurate and truthful the findings are.

1.8.6 Reliability

The extent to which a measurement of a phenomena yields findings in a stable, dependable and consistent form is referred to as reliability (Carmines & Zeller, 1979). Reliability in a qualitative research method is discussed below:

1.8.6.1 Reliability in qualitative research (dependability)

Kumar (1996:140) states that where a research tool is consistent and stable, and therefore predictable and accurate, it is considered reliable. Hence, the essence of reliability for qualitative research lies with consistency (Leung, 2015:Online). The consistency of this research should be as dependable as possible. Dependability refers to data stability over time and under varying conditions (Elo, Kaariainen, Kanste, Polkki, Utriainen & Kyngas, 2014:2).

1.9 ETHICAL CONSIDERATIONS

The fundamental ideals of academic integrity and honesty, as well as respect for others, are among a researcher's ethical obligations (Punch, 2016:23). Therefore, honesty, integrity, validity and reliability are informing the credibility and trustworthiness of a research study, hence compliance to ethical and moral

considerations are crucial to a study. In fulfilling these principles for this study, the researcher began by ensuring adherence to the following:

- Respect for individuals: respect for participants' autonomy, decision-making and dignity;
- Beneficence: lessen risks (physically, mentally and socially) and optimise benefits for participants in the research;
- Justice: participants should be chosen from groups of people who will benefit from the research; and
- Respect for communities: safeguard and respect the community's overall interests and values and keep the community safe (Center for Innovation in Research and Teaching, 2019:Online).

After determining the sample size and sampling procedures, the researcher applied for a research ethical clearance letter from the North-West University. Upon the issuing of the research ethical clearance letter, the researcher then established contact with the respondents and all other participants, such as the National Treasury, the Department of Transport, SANRAL, N3TC, TRAC, BPCC, ANC, EFF, RFA, SAFTU, and OUTA.

Before receiving the participants' informed consents, the researcher briefed them about the risks regarding participating in the research study and assured them of the protection of their identity since confidentiality and anonymity was important to securing their participation in the study. Due to the variety of participants, the researcher sought the help of research assistants. The interviews avoided prejudicial and vague phrases and the interviewer avoided personal bias.

1.10 CHAPTER LAYOUT

The exposition of chapters for this study are as follows:

Chapter 1: Introduction and Orientation

This chapter provides the background and the problems associated with the toll road concessions that were studied and from which the research questions and objectives were developed. It further outlines the methodology, ethical considerations, chapter layout and theoretical statements for this study.

Chapter 2: The Theoretical Perspective of Infrastructure Development and Public-Private Partnerships

In this chapter, secondary sources provide information on the institutional function of principals in the toll road concessions. The analysis of the various secondary sources focuses on national and international perspectives. The foundational and theoretical perspectives on PPPs, in the context of the toll road concessions are also explored.

Chapter 3: Statutory and Regulatory Framework Governing PPPs in SA

The statutory and regulatory framework that governs PPPs in SA and the related literature is discussed in this chapter.

Chapter 4: Analysis of PPP Models on Toll Road Concessions

This chapter employs a structured analysis to study various PPPs models used for toll road concessions both in general and in relation to the institutional function of principals globally.

Chapter 5: Research Methodology and Design

A thorough description of the data collection methods, research instruments, procedures, themes, sampling and research design is provided in this chapter.

Chapter 6: Presentation and Discussion of the Findings of the Study

The analysis of collected data and its interpretation is discussed in this chapter. Furthermore, this chapter presents the findings and results on the toll road concessions investigated.

Chapter 7: Good Practices and a Suitable Model for the Toll Road Concessions Investigated

In this chapter provides an in-depth discussion on a successful model for, and the good practices of the toll road concessions.

Chapter 8: Conclusions and recommendations

In this final chapter, the presentation of scientific conclusions and recommendations are discussed.

CHAPTER 2

THE THEORETICAL PERSPECTIVE OF INFRASTRUCTURE DEVELOPMENT AND PUBLIC-PRIVATE PARTNERSHIPS

2.1 INTRODUCTION

The previous chapter discussed the introduction for the study, the problem statement, research question, the objective of the study and the details of the research methodology. The ability to provide social infrastructure to citizens has been a contentious issue for governments around the world due to limited financial and technical capacity. To design, finance, build and operate social infrastructure projects, governments around the world have turned to public-private partnerships (PPPs) (World Bank, 2018:13). These social infrastructure projects are important for the public, however, substantial amounts of capital investment are involved (Cheung, Chan & Kajewski, 2009:82). The vast amounts of capital investment required coupled with social pressure on the economy have prompted governments around the world to recognise the importance of PPPs as a form of financial reprieve.

However, it should be mentioned that it is the primary responsibility of the governments around the world to provide basic social infrastructure to their citizens, and that PPPs cannot be viewed as a replacement mechanism for the traditional contracting or public procurement processes in which the government invites the private sector to bid under defined terms and conditions (such as specifications and needs). It is worth noting that PPPs are not solely a solution to infrastructural backlogs but rather one part of the solution to this challenge.

The rollout of toll road infrastructure can also adopt the PPP approach to secure the much-needed capital funding, efficiency, and by extension, technical expertise from the private sector. For the rollout of toll road infrastructure, PPPs tend to overwhelmingly take the direction of concessions, which are the focus of this study.

2.2 THE CONCEPT OF SOCIAL INFRASTRUCTURE

Fourie (2006:3) alludes that investment in social infrastructure brings about the ability to render infrastructure services and therefore leads to economic growth. Social infrastructure drives economic growth and better the lives of citizens, however, it isn't

cheap. Infrastructure is economically costly, requiring considerable capital with a large share of public spending/expenditure and pressure on public authorities (World Bank(a), 1994). The pressure placed on the public authorities due to the substantial capital required for infrastructure, prompted the authorities to seek alternatives such as public-private partnerships (PPPs) to rollout and deliver infrastructure projects. Therefore, PPPs are a key factor in the rollout of social infrastructure. In support of this, Wai, Aminah, Tey and Syuhaida (2012:3) argue that it is not easy to separate the PPP from the social infrastructure projects. The social infrastructure projects are highly dependent on PPPs. Wai, Aminah and Syuhaida (2011:567) concluded that the social infrastructure projects as a provision and means of infrastructure are usually procured through the PPP contracting process.

The implementation of public-private partnerships in different countries around the world attracts many governments to embrace PPPs. Before entering PPPs into the discussion, this classical question should be answered: “Is infrastructure the initiating factor in the development process or it is merely a passive or accommodating factor?”, as asked by Looney and Frederiksen (1981:286). Infrastructure is the catalyst for development since economic and social development revolves around it. In support of this, Jochimsen (1966) alludes that infrastructure is the critical, important and imperative preconditions of economic and social development. Due to its contribution to economic and social development, infrastructure is described similarly in various parts of the globe. Infrastructure in France is described as “public service,” in Anglo-Saxon nations it is termed the “universal service obligations”, and in the rest of Europe it is described as “services of general interest” (Offner, 2000). All three terms indicate that the state or government is to lead infrastructure rollout (either individually or through PPPs) for the benefit of the public or society at large by means of improved services. Buhr (2014:1) indicates that the word “infra” derives from Latin and it means “below”, therefore “infrastructure” may be used to imply “foundation”. In clarifying various categories of infrastructure, Torrance (2009:81) provides us with the following:

- railways, airports, as well as roads with user fees, are examples of transportation infrastructure;
- regulated infrastructure, such as water, gas and electricity distribution networks with regulated service contracts attached to availability fees; and

- governments finance or pay the availability fee for social infrastructure such as schools and hospitals over a 20-to-30-year period.

In line with the above assertions, Jochimsen (1966:103) defines infrastructure as the totality or entirety of all earning assets, properties, equipment, facilities and circulating resources, or capital in an economy serving the provision of energy, telecommunications and transport services, installation of education, public administration, research, social welfare, science and health care. The term “social infrastructure” refers to the facilities that are required for the economy and society to function properly (Yescombe, 2007). These definitions place the state at the centre of providing basic social infrastructure to the public. Social infrastructure focuses on infrastructure provision of hospitals, prisons, roads, public schools, etc. (Fedderke & Garlick, 2008).

To achieve economic growth and improvements in the quality of life of citizens by means of social infrastructure requires an investment. The inadequate quality of social infrastructure is however a key factor in society’s marginalisation (Kamiński, 2010:85). This investment in social infrastructure should be mitigated by developing bankable, appetising and well-designed infrastructure projects that will be attractive to the private sector and should mostly come in the form of PPPs. It should also be emphasised that the public sector on its own cannot afford the rollout of all massive infrastructural programmes and it therefore requires the assistance of the private sector in the form of PPPs. The next section discusses road infrastructure thoroughly.

2.2.1 The Development of Road Infrastructure

There are three modes of transportation, namely land, water and air transportation. For the purpose of this study, the focus is on land transportation, and in particular road infrastructure. Road infrastructure allows people and goods to be transported or moved within and between countries (Ivanova & Masarova, 2013:264; United States Agency for International Development (USAID), 2013:1; Gibson, Milnes, Morris & Hill, 2011:1). Gelete and Gokcekus (2018:1); Bull, Mauchan and Wilson (2017:9) further state that road infrastructure networks are key to economic development and growth. These movements of people and goods account for millions of kilometres daily. Internationally, roads are a dominant transport resource and asset, and a vital

infrastructure used by millions of commuters every day, spanning millions of kilometres worldwide (Marović, Androjić, Jajac & Hanák, 2018:1).

From the above statement, it is clear that the development of road infrastructure does not only benefit the economy but also provides a common good for the citizens of a country (Schachtebeck & Mbuya, 2016:88). However, these benefits from road infrastructure come at a high financial cost. As a result, the construction of road infrastructure directly affects the cost of transport (Botrić & Šišinački, 2006:7). The advantages and benefits of road infrastructure supersede the challenges and Table 2.1 below provides a summary of the benefits of the road infrastructure in different countries.

Table 2.1: Summary of Benefits of road infrastructure investment

Year	Author	Benefit derived	Country
1997	Gannon and Liu	• Lower consumer goods price; and • Improves accessibility of services.	China
2000	Jacoby	• Improved access to market for agricultural producers	Nepal
2002	Fan, Zhang and Zhang	• Increasing non-agricultural jobs and increasing productivity in agriculture.	China
2003	Ali & Pernia	• Growth in GDP; • During road construction, jobs are being created; • Economic growth; and • Disposable income increases.	Indonesia Philippines
2004	Lehovec	• Territorial advantage and benefit; • Tourism increases; • Creation of jobs; • Trade and commercial zones are being created; and • Accident rates get reduced.	Czech Republic
2009	Shalini, Boopen and Rojid	• Market accessibility for the poor get enhanced; and • Creation of jobs during road construction.	Benin, Burundi, Cameroon, Gambia, Ghana, Kenya, Mauritius, Niger, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia and Zimbabwe.

Year	Author	Benefit derived	Country
2010	Asia News Monitor	• Transport costs get reduced; • Market access get enhanced; and • Trading activities adjacent to roads get increased.	Bangladesh
2010	Gonzalez-Navarro and Quintana-Domeque	• Motor vehicle sales increase due to increased mobility; and • Property value rises.	Mexico
2012	Cuciureanu	Link areas of economic activity	Romania
2012	Seetanah	• Economic growth increase; • Improved living standards; • Access to employment opportunities is increased; • Access to health care or services are improved; and • Access to education is improved.	Benin, Burkina Faso, Burundi, Cameroon, Egypt, Ethiopia, Gambia, Ghana, Kenya, Madagascar, Malawi, Mauritius, Niger, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.
2012	Financial Express	• Improved marketing of factors of production.	Bangladesh, China and India
2014	Rahman	• Reduction of expenses in marketing; • Reduction of transport costs; • Input costs are lowered; and • Improved access to markets.	Bangladesh
2015	Jie	• Per capita income to increase; and • Improved market accessibility for the poor.	China
2015	Jaitman	• Improved markets access; • Job opportunities are accessible to citizens; and • Healthcare services are accessible to citizens.	Latin America and the Caribbean

Source: Schachtebeck and Mbuya (2016:94-95) authors' compilation

In summary, Table 2.1 shows that the development of road infrastructure across the world has an impact on different sectors of the economy because roads create market access. Therefore, the substantial capital that takes a considerable share in public expenditure to provide social or public infrastructure to citizens requires that governments seek alternative methods to complete infrastructural projects with their

limited budgets. This is achieved by entering into PPP arrangements with the private sector. The next section focuses on the establishment of PPPs to manage infrastructure backlogs.

2.3 CONCEPTUALISATION OF PPPS FOR TOLL ROAD INFRASTRUCTURE

The third International Conference on Financing for Development recognised that through public-private partnerships, both public and private investments have vital roles to play in infrastructure funding (Addis Ababa Action Agenda (AAAA), 2015:paragraph 48). The reasons for the adoption of PPPs differs mostly based on whether the country has a developing or developed economy. According to Nwangwu (2016:7), the inadequacy or insufficiency of public funding to fulfil the rising demand for infrastructure appears to be the driving force behind the widespread use of the PPP model for infrastructure provision in developing nations. In the case of developed nations, the justification for assuming PPPs include assertions that these arrangements provide greater value for money and increased efficiency in the provision and operating of infrastructure services in more politically appealing or enticing forms than nationalisation or privatisation (Harris, 2004:3).

2.3.1 PPP Definitions - Global and South African Perspectives

From the discussions above, it is clear that there is no definitive definition for PPPs since every nation, country or region will have its own definition depending on its developmental needs, goals or objectives. The Organisation for Economic Co-operation and Development (OECD) (2014:19b) alludes that a PPP is a concept that has widely been utilised despite the absence of a clear definition. In support of this, Cruz et al. (2013:1) posit that although there is no clear or unique definition for a PPP, it may be summarised as a procurement model for infrastructure provision. In fact, not only is there no consensus on a single definition for a PPP, there is also much discussion about what constitutes a 'true' PPP and what does not, with some adamantly supporting the view that only a PPP in service of infrastructure is a 'true' PPP (Roman, 2015:1). Wong, Yeoh, Chau, Yam, Cheung and Fung (2015:262) argue that because of the social, economic and political context, the definition for PPP changes from country to country. To demonstrate that there is no definitive definition for PPPs, the United Nations (UN) (2016:3) contends that various countries formulate

their own PPP definitions based on their policies, laws and regulations, resulting in differences in the definitions. Table 2.2 illustrates these differences.

Table 2.2: Different Countries Definitions of Public-Private Partnerships

Country	Definition
South Korea	In the context of South Korea, a PPP project is defined as a project that uses private capital to build and operate infrastructure such as roads, ports, railways, schools and environmental facilities, which have traditionally been built and operated with government funds, thereby tapping the private sector's creativity and efficiency.
South Africa	When it comes to SA, PPP outputs are defined to better match service specifications with user expectations (i.e. public interest and service) and to put pressure on service providers to satisfy service standards (OECD, 2012:1(a)).
United Kingdom	In the case of the UK, PPP is defined as arrangements characterised by shared collaboration between the public and private sectors. They can encompass all kinds of co-operation across the private-public sector interface that involves collaborative working and risk-sharing to provide policies, services and infrastructure.
State of Victoria (Australia)	In Australia, a PPP is defined as involving private investment or financing in the provision of infrastructure and any related ancillary service, with a current value of payments for a service to be made by the government (and/or by consumers) of more than AUD 10 million during the period of the partnership that is not related to the general procurement of services.

Source: OECD (2012:12(a))

Comparing PPP definitions helps to close the gaps that usually occur when one definition is being used. All of the definitions above neglect the most important element of PPPs, re-negotiation. Since the long-term contractual arrangements are bound to have disputes at some point in time, PPP contracts are frequently re-negotiated, with parties attempting to amend several key components, such as tariffs, how often they may be altered or adjusted, financial commitments, the scope of what must be accomplished and completion dates (Mouraviev & Kakabadse, 2017:74). The countries indicated in Table 2.2 do not integrate non-governmental organisations in their definitions. Since PPPs are intended to benefit the civil society, non-governmental involvement is crucial from the beginning to the end of the PPP process. These definitions exclude a broader variety of arrangements in which non-governmental organisations, such as churches, trusts, non-profit civil society groups,

etc., are participating in the development and delivery of public or semi-public services (OECD, 2013:3). The definitions underscore and emphasise the partnership between the public and private sector although they do not mention different components of a typical PPP project. Nwangwu (2016:2) argues that PPP definitions should include the breakdown of different components of a typical PPP project, such as the design, finance, construction and operation. All of the definitions provided in Table 2.2 do not touch on the ownership structure of a PPP that clarify the role of the private sector in terms of resource and expertise contribution. In practice, PPPs are defined or characterised differently based on the private partner's degree of asset ownership and capital expenditure (UN, 2016:3). The next section deals with the theoretical exposition of PPPs in toll road concessions.

2.4 THEORETICAL EXPOSITION OF PUBLIC-PRIVATE PARTNERSHIPS IN TOLL ROAD CONCESSIONS

2.4.1 New Public Management Theory

Several international organisations and many governments have come to embrace new public management (NPM) as a paradigm or framework for revamping government and re-designing the public sector to improve the links between the government and the mechanisms, both in civil society and government, which are accountable for how competently the government functions (Armacost, 2000:v). The NPM methodology was first implemented in the 1980s to revamp, modernise and replace the traditional public administration (TPA). Islam (2015:141) further characterises NPM as a normative conceptualisation that is fundamentally distinct from TPA in many respects, offering services that citizens value in order to strengthen the autonomy of public managers and reward individuals and organisations for improving the efficiency of public sector production. However, NPM doctrines on the other hand, tend to focus on establishing clear targets and specifying outputs but overlook the fact that efficiency is a relative concept that depends on appropriateness and context. Efficiency is defined as accomplishing a desired effect with the least amount of resources (Drechsler, 2005:2). Efficiency improves business techniques and these techniques are important in the success of a business, however their implementation in the public sector is cumbersome and less successful. The application of business techniques to the public sector sphere complicates the basic necessities of any state, particularly a democracy in that transparency, regularity and

due process are considerably more important than speed and low cost (Drechsler, 2005:2).

However, there are concerns raised by others regarding NPM. Commentators questioned whether NPM reforms were appropriate in the context of minimal political support and capacity, emphasising the importance of having supportive institutional and political conditions for success, as well as prioritising the capacity building of core public sectors as a priority for public management reforms (Nunberg, 1992). This minimal or weak capacity and political support compromises the effective implementation of NPM. Nevertheless, the concept of NPM is founded on the assumption that a unique activity-management can be applied to the public sector in the same manner that it has been applied to the private sector, and it consists of many components as shown below (Osborne, 2006:379; Aucoin, 1990; Bale & Dale, 1998):

- The public sector's adoption of private-sector management techniques;
- Efficiency is emphasised;
- A departure from the rules, input controls and processes towards performance targets and output measurement;
- Contestable provision, private ownership and contracting out of public services are preferred; and
- Management control is being decentralised with enhanced monitoring and reporting systems.

Robinson (2015:8) and Tolofari (2005:75) state that the abovementioned marketisation reforms, or the application of business management theories and practices for public sector administration, became known as NPM in the professional jargon or parlance. As a result, NPM brought some level of neutrality between private and public sector agreements to bring about the negotiated public policy. Therefore, NPM has been touted as a politically neutral framework — a framework with broad application that has been advocated as a way to address 'management challenges' across a variety of policy domains, levels of government and countries (Vabø, 2009:2).

2.4.1.1 *The relevancy of NPM in PPPs*

In the context of PPPs, NPM enables the private sector to employ best business practices into a PPP arrangement. As a consequence, the government created an agency that operates in a semi-autonomous manner to enter into PPP contractual agreements with private partners on behalf of the government. These PPP contracts enable the government agency to contract-out work to private partners in which the private partners recover their costs (cost recovery) by means of user fees/charges.

New public management advocates for the use of performance contracting which forms part of the PPP contractual agreement and serves as the measure which the state agency uses to assess if the private partner is performing its duties in accordance with the contents of the contractual agreement. This places some level of accountability on the private partner.

New public management further encourages the dual structure, in which the government format of doing things is incorporated into that of a business in which the markets determine the direction. The adoption of the dual structure replaces the traditional or classical linear hierarchical structure. The idea of adopting the dual structure is to modernise the government to increase its ability and capacity with improved efficiency and less stagnation.

2.4.2 *New Public Governance Theory*

According to Osborne (2010:7), the Classical Public Administration (CPA) and NPM systems are unable to deal with the mounting complexities that a globalised and networked society faces. Robinson (2015:9) further argues that the new public governance (NPG) approach prioritises citizens above government in its frame of reference. The primary priority for public servants should be servicing the citizens, however, this should be achieved without neglecting the government departments and institutions. These government departments and institutions should establish linkages with external organisations. New public governance, as a new paradigm in public administration theory, promotes pluralism, placing a high priority on the linkages between internal and external organisations, and emphasises organisational governance (Xu, Sun & Si, 2015:12). The pluralism and linkages promote the broader spectrum of stakeholder (public, private and nongovernmental sectors) involvement in

infrastructure development. New public governance, as a co-operation amongst the public, private and nongovernmental sectors, attempts to link all available governance potential and resources in order to resolve society's challenges (Pataspas, Ralph & Smalskys, 2014:28; McQuaid, 2010:353-365).

According to Table 2.3, NPG encourages the organisation to put focus on itself and the external environment (i.e., citizens' welfare) rather than focusing only on its internal affairs and politics. The NPG further advocates for the building of better relationships with external organisations to influence its overall policy values rather than the adoption of a policy that is isolating in nature and hostile to external organisations.

2.4.2.1 *The relevancy of NPG in PPPs*

The NPG is relevant to PPPs in that it promotes meta-governance, in which the public and private sector efforts (such as methods, instruments, strategies, etc.) are co-ordinated to deliver social infrastructure. Again, meta-governance as a characteristic of NPG promotes ethical principles and norms in the entire PPP process since it also allows for the hybrid governance style between relevant government departments. This type of governance characterises NPG as it strives for pluralism in which the private sector is allowed to exert its influence by means of resources in the PPP arrangement. Linkages between the public and private sector are enhanced in NPG.

As a result of pluralism, NPG advocates for the building of better relationships between the government, all external organisations and civil society to influence overall policy values (PPP policy) rather than the adoption of a policy that is isolating in nature and hostile to the external organisations. New Public Governance places the responsibility for feedback functions on the political-administrative system.

2.4.3 *Principal-Agent Theory*

A common and frequent feature for greater private sector involvement or participation in toll road infrastructure provisions is the utilisation of toll road concessions (Mallett, 2009:2), and toll road concessions forms part of the PPPs. The toll road concessions, as a form of PPPs, serve as a key economic, passenger and leisure artillery in the country as they do not subscribe to a cumbersome bureaucratic process like traditional procurement. PPPs are frequently adopted as alternatives to inefficient state-owned

enterprises and bureaucratic public services (Cavelty & Sute, 2009). To minimise the impact of inefficiency on the part of the state-owned enterprises, the concessions, as a form of PPPs, were introduced to achieve sound governance principles. The World Bank (2011:41) defines governance as the institutions and traditions that exercise authority in a country for the common good. This includes (i) government's capacity to effectively manage resources and enact sound policies, and (ii) the respect of citizens and the state for the institutions that govern economic and social interactions among them.

From a range of governance theories, namely stewardship, resource-dependence and stakeholder theories, this study adopted the principal-agent theory (used interchangeably with agency theory) because SANRAL (principal) contracted N3TC, TRAC and BPCC (agents) as project-based PPPs to manage the toll road concessions investigated for this study. In managing these toll road concessions, the agents (or concessionaires) are responsible for managing the financial and physical (the roads) assets, revenue collection, shareholder equity and commercial debt over a thirty-year period, but most importantly, all these responsibilities of the agents must be executed under the stewardship of SANRAL. According to the principal-agent theory perspective, a government agency should exercise strong control, monitoring and supervision of the agent's performance to defend the principals' interests (Hillman & Dalziel, 2003). PPPs are complicated contracts that vary greatly from one project to the next and from one area to the next (Istrate & Puentes, 2011:2).

The principal-agent relationship is considered as accountability-based performance management in terms of monitoring, auditing, benchmarking and evaluating in order to improve performance (Dubnick, 2005:3-4; Demirag & Khadaroo, 2011:272). This theory serves as the basis for analysis of toll road concessions as a form of PPPs. According to Jensen and Meckling (1976), the principal-agent theory focuses on a partnership in which one or more people (the principal(s)) contract another person (the agent) to complete work on their behalf. However, this principal-agent relationship is mired with problems. Problems with a principal-agent relationship under a CPA occur when the agent conducts work on behalf of the principal, but the agent executes the required tasks in a way that is opposed to the principal's best interests (Murtishaw &

Sathaye, 2006:1). According to Eisenhardt (1985:58), principal-agent theory is concerned with resolving two problems, namely:

- the objectives and desires of the principal and agent are at odds; and
- monitoring what the agent is doing is difficult or expensive for the principal.

According to the above information, individuals (both principals and agents) want to maximize their individual economic utility within the corporate environment (Davis, Schoorman, & Donaldson, 1997). Despite their (both principals and agents) own economic utility, risk-taking preferences, self-interest, bounded rational and other negative factors associated with this relationship, the principal has limited choice. According to Moldoveanu and Martin (2001:3), to raise the asset's worth or value, the principal retains and appoints the agent for certain skills and expertise. If the agent fails to demonstrate these attributes or characteristics, it is referred to as an adverse selection problem. When an agent lacks or fails to display the essential skills or capacities to properly satisfy the principal's expectations, there is an adverse selection problem (Payne & Petrenko, 2019:21).

This legal relationship is volatile by nature and most of the time the volatility raises the costs incurred by both partners. Landstrom (1993:205) alludes that *monitoring costs* are the expenditures paid by the principal to monitor and manage the agent's behaviour, whereas *bonding costs* are the costs incurred by the agent to show conformity with the principal's demands. While monitoring and bonding costs are incurred to account for and resolve the principal-agent differences and asymmetries, *residual loss or cost* is attributable to unresolved conflicts of interests and information asymmetries between the parties (Jensen & Meckling, 1976; Mahoney, 2005). The next section focuses on toll road concessions as a form of PPPs.

2.5 TOLL ROAD CONCESSIONS AS A FORM OF PPPS

Concessions, the most prominent type of PPP, in which the private sector exclusively maintains and develops infrastructure or delivers services of wide economic interest, have been around for thousands of years (United Nations (UN), 2016:2). There is an acknowledgement that concessions as a form of PPPs are not a new concept but of note is the contractual and exclusivity details of each and every concession. According to OECD (2014:11), a **concession** is an agreement to operate a facility or provide a

service on an exclusive basis for a given contractual term. Mouraviev et al. (2017:74) and Nikolic and Maikisch (2006:3) further state that a concession entails a private party (agent or concessionaire) building or renovating an asset, such as a road, using private finance and, in certain situations, the transfer of an asset from a public agency to a private sector partner. Whether a road as an asset is being transferred to a private party or the private party initiates the construction of the road from the beginning to the end (greenfield project), both instances require private funding and the private partner takes the market risk for it. The concession project is a user-based toll road in which the private party bears the entire market risk (Babatunde, Perera, Udejaja & Zhou, 2014:147; Fisher & Babbar, 2005:6). Although in certain cases, the government offers an explicit or implicit guarantee to safeguard the private partner from the possibility of lower-than-expected returns or other risks (Nikolic et al., 2006:3).

However, it is worth mentioning that in some instances during the negotiation with the host government, there is a possibility to transfer all of the project risk to the private sector. Alternatively, the private investor can accept the risk-sharing arrangement between the two parties. This is not the definitive process because there are instances where private partners can refuse to take on any of the risk for the project. In circumstances where the host government transfers all of the project risk to the private sector, the private partner bears significant investment risk. In support of this, Munya (2010:1) argues that concession happens when a private partner takes over the management of a state-owned road for a set period of time while simultaneously taking on significant investment risk. For taking on all these risks, an agent (private sector partner or concessionaire) is compensated in numerous ways depending on the contractual agreement. The first form of compensation is for a private company to charge user fees to recoup its investment and operating costs (Mouraviev et al., 2017:74). The second form of compensation is for the principal to use a shadow toll as a form of payment. Payments based on traffic volumes that are paid by the principal to the agent on behalf of the final user at predetermined points along the road are known as shadow tolls (Williams, 2003:9).

It is the responsibility of the private partner to operate and maintain the toll road and this is made possible by the collection of toll fees, therefore the selected private partner must be up to the task since the private partner selection process is rigorous. The

private entity is chosen in a competitive process but the amount for the concession fee presented by the private party is the most crucial factor (Cui, Sharma, Farajian, Perez & Lindly, 2010:19). Therefore, the competitiveness of the company is not the only criterion that qualifies it but its capacity to raise the needed funding is also crucial.

Unlike the past, governments now have options for determining implementation strategies using appropriate management and funding models to suit the toll road context in terms of cost effectiveness, reliability and socio-economic sustainability. In support of this assertion, Arata, Petrangeli and Longo (2016:343) state that major public road authorities have shown an increasing pattern when pursuing alternative ways to build and execute road infrastructure concession systems in recent decades, with the primary goal being to make it possible in a dependable, socio-economically sustainable, and cost-effective manner. The technologies and infrastructure for toll road concessions are thoroughly discussed in the next section.

2.6 INTERNATIONAL PERSPECTIVE ON TOLL ROAD CONCESSIONS

The toll road concessions are implemented differently in various parts of the world. The social, political and economic environment of each country determines the degree of success in the implementation of toll road concessions, and every country experience unique challenges in terms of the rollout of toll road infrastructure.

2.6.1 United States of America (USA)

In comparison to many other countries, such as Australia, Germany, the United Kingdom and Canada, only a tiny fraction of infrastructure projects in the USA are now financed through PPPs (Roman, 2015:7). In support of the above statement, Swan et al. (2007:4) further state that private management of road infrastructure (toll road concessions) remains relatively rare in the USA. In terms of servicing road infrastructure in the USA, the government is relying on different forms of taxes since the PPPs only contribute a small percentage to road infrastructure projects. Currently, USA's roads are being paid for through other methods such as vehicle registration fees, tire taxes (for trucks), fuel taxes, tolls (rarely used), general fund revenues (including sales taxes) and others (Atkinson, 2019:3). In support of this argument, Swan et al. (2007:5) and McDonald (2004:347-348) state that local, state and federal governments all collect fuel taxes in the US and this is the primary model for funding

road construction. This primary model is unsustainable in the sense that financing shortfalls in transportation will worsen in the subsequent years as improvements in vehicle fuel efficiency and the introduction of alternative-fuel vehicles decrease state and federal fuel tax revenues by billions of dollars each year (Sorensen, Ecola & Wachs, 2020:4). The current status of using this primary model to finance road construction in the USA does not provide enough of the much-needed funds and is unsustainable. Gas or fuel taxes are becoming unsustainable as a means of funding America's road infrastructure as trucks and cars get more fuel efficient and become electrified (Atkinson, 2019:1). Due to a growing funding shortfall in the road sector in the USA, more states have begun to seriously consider PPPs for the development and maintenance of road infrastructure (Cui & Lindly, 2010). In mitigating this challenge of funding shortfalls by means of PPPs, the Intermodal Surface Transportation Efficiency Act (ISTEA) was passed in 1991 to broaden toll facility eligibility for federal funding assistance, including construction of new toll facilities, resurfacing, reconstruction, rehabilitation and conversion of select facilities to toll highways (Williams, 2003:19). Table 2.3 illustrates some of the toll road concessions in the USA.

Table 2.3: Toll Roads Concessions in the United States

Project name	Principal	Concessionaire	Lease period	Source
Indiana Toll Road (I-80)	Indiana Department of Transportation	Indiana Toll Road Concession Company	75-years	Schmitt and Chung (2014); Segal (2006)
State Route 91- California	Orange County Transportation Authority (OCTA)	California Private Transportation Company (CPTC)	35-years	Sullivan (2000)
Northwest Parkway	Colorado State	Kiewit Western Company and Washington Group International.	99-years	
Southern Connector Toll Road (I-185)	South Carolina Department of Transportation	Interwest Carolina Transportation Group,	50 years	United States Department of Transportation (Online)

Source: Compiled by the researcher

Table 2.3 shows the lease period of each concession and the names of the principals and concessionaires are also mentioned. Unlike in South Africa, in USA the toll road concessions' lease period extend beyond 30-years. These lease periods might be beneficial to the concessionaires as far as revenue collection is concerned, however, these long lease periods might negatively impact the performance of the concessionaire due to procrastination and entitlement.

With respect to congestion pricing, the California Air Resources Board (CARB) established the California's Global Warming Solutions Act of 2006 to mandate greenhouse gas emission reductions, and a congestion charge was considered as a possible solution (Pike, 2010:20). The introduction of the congestion pricing model in California also assisted with global warming related issues, and it was discovered that the Electronic Toll Collection (ETC) in San Francisco Bay capped the fuel consumption. Over a ten-year assessment period, ETC saved around 40% on fuel use at the Carquinez Bridge in the San Francisco Bay region according to one research study (Roy, Nag & Goswami, 2016:2).

2.6.2 European Union (EU)

European countries need to invest in road infrastructure to increase their competitiveness (Medda, Carbonaro & Davis, 2012:83). However, EU as a block has individual member states with individual road needs, objectives and approaches. Since all twenty-seven member states are having different social and economic systems and infrastructure endowments, as a result of this member states will choose a variety of approaches in constructing the road infrastructure according to their individual social and economic objectives (Medda et al., 2012:83). To illustrate the differences in objectives and approaches of toll road infrastructure in Europe, toll road concessions were introduced in Oslo to raise revenue to finance a variety of improvements to the local transportation system, including new road construction (to increase road capacity), improvements to pedestrian and cyclist facilities and improved segregation and priority for public transportation (EU, 2003:25). Furthermore, the traffic flow in the charging zone (toll road) in central London have been lowered by roughly 15%, while vehicle movements into the zone have been cut by 30%, with taxis, coaches and bus movements all increasing by 20% (Hosseini, Zolfaghari & Yazdanpanah, 2016:307).

According to Roy et al. (2016:2) and Rodrigo et al. (2015:4), Norway was the world's first country to widely adopt ETC technology which was originally implemented in Bergen in 1986 and operated alongside traditional cash tollbooths. The ETC as a form of tolling technology has been successfully implemented in Norway and the congestion pricing in London managed to fulfil its purpose. Reduced congestion, improved bus service, improved travel time reliability for vehicle trips, and more efficient distribution of goods and services are all objectives of London's congestion pricing scheme (Tri-State Transportation Campaign, 2017:7).

With the advent of international trucking in the European Union, the Toll Collect Program (TCP) was established to charge commercial users for the damages they inflict to the German highway system and to promote rail freight transit (Rothengatter & Doll, 2002). The introduction of TCP in Germany specifically targeted trucks as other forms of taxes were not effective in mitigating the damage inflicted by the trucks to the roads, since studies have shown that huge trucks cause more damage to roads than they pay in road taxes. It is perhaps predictable that truckers would be unhappy with a new pricing system that intentionally and explicitly pushes more of Germany's financial burden onto heavy vehicles (Taylor, 2010:38).

Toll systems are gradually being recognised as the most efficient way of substituting taxpayer money with user money in European countries (Williams, 2003:20). The toll systems allow for major capital projects and routine maintenance to be executed without the usage of taxpayer money. In Europe, routine maintenance activities and considerable capital projects are already outsourced, mostly for toll road infrastructure. In Finland for example, 60 percent of capital projects adopted the design and build (DB) model rather than the conventional design, bid and build (DBB) model (Altamirano et al., 2007:2).

2.6.3 Asia

The road pricing system was first developed in Asia. Singapore's road pricing system began in June 1975 with the Area Licensing Scheme (ALS), a manual system based on paper permits, and has since evolved into the current Electronic Road Pricing (ERP) system (Menon & Loh, 2015). Singapore, like other countries in Asia, adopted a tolling system due to inadequate road maintenance. Other Asian countries followed

suit by adopting tolling because large areas of Asia's road networks receive little or no maintenance from one year to the next (ILO, 2008:16).

For the time being, the only available payment mechanism for toll road users in Sri Lanka is the cash collection method (Rodrigo et al., 2015:1). A cash collecting method contributes to long traffic lines at toll booths, hence the introduction of ETC to increase the traffic flow at the gantries was necessary. When ETC was initially introduced in Taiwan in 2006, the cost of installation was expensive and the number of users was low, but as more people began to use it, the costs of installation fell (Roy et al., 2016:2).

The Philippines' BOT law is recognised as best practice for toll road concessions among emerging Asia-Pacific countries. It incorporates a variety of contractual structures such as BTO, BOO, BLT, etc., in addition to BOT (Grimsey and Lewis, 2004). The BOT model is commonly used amongst Asian countries, including Cambodia. Cambodia's Phnom Penh-Sihanoukville Expressway (4 lanes) is also based on the BOT model, with a commercial official opening date in 2023 (Sar, Chea & Ung, 2020:1219).

2.6.4 Africa

In Sub-Saharan Africa, road infrastructure is currently the means for transporting approximately 75% of passengers and freights (Beuran, Gachassin & Raballand, 2015). However, with such high reliance (75%) on road infrastructure, most African countries still under spent on road infrastructure in terms of maintenance and construction. According to Heggie (2011:ix), African countries spent far too little on periodic and routine maintenance over the last two decades (1990-2010), resulting in roughly a third of the \$150 billion invested in roads being deteriorated or eroded through lack of maintenance. Lately, most African countries have realised the importance of road maintenance and construction hence the introduction of a tolling system. The Accra-Kumasi Toll Roadway in Ghana is designed to alleviate traffic congestion, lower vehicle operating costs, stimulate economic growth in Ghana's most significant economic districts and increase access to northern Ghana and landlocked neighbours (Brocklebank, 2014:54). Despite all the advantages stated above, the toll system technology in Ghana is improving at the slow pace. The majority of toll booths in Ghana, like those in other developing countries, are operated manually, which is

riddled with challenges (Kommey, Acquaye and Abeka, 2020:22). On the other hand, the Accra-Tema toll booth is the only one that has been computerised in some way (Ghanaweb.com, 2019). The toll plazas on the Accra-Tema highway are the oldest in Ghana, with two toll plazas, one for traffic lanes bound for Tema and the another for traffic lanes bound for Accra (Opoku–Boahen, Adams and Salifu, 2013:16).

Further upgrades were permitted on this toll road and the Arterial Toll Roads Company Limited (ATRCL) made an unsolicited proposal for the dualisation (two lanes each direction) of all unimproved parts of the Accra-Kumasi highway through a design, build, finance and operate (DBFO) PPP concession (Brocklebank, 2014:62). The duration awarded to the concessionaire before transferring the Accra-Kumasi Toll Roadway back to the government is a 30-years.

In Nigeria, the Lekki Concession Company (LCC) was specifically established to design, finance, upgrade, rehabilitate, operate and maintain the Lekki Toll Road based on a 30-year concession agreement with the Lagos state government (Olele, 2016:195). However, the Lekki Toll Road has faced difficulties such as a high procurement cost, high upfront costs, lack of specialised expertise, and managing and engaging with stakeholders (Edwards, 2010). Despite these challenges, a significant amount of work has been done on the toll road. The first phase of the 49.5-kilometre Epe–Lekki Toll Road in Lagos state, which began in 2006, is now finished and operating (Amadi, Carrillo & Tuuli, (2014:425). The project cost was initially anticipated to be £222 million adopting a design, build, operate and transfer (DBOT) model as the road concession agreement between the Lekki Concession Company and Lagos state government (World Economic Forum, 2010).

Lastly, in Senegal, the Dakar-Diamniadio Toll Highway (DDTH) was built to offer a high-quality, tolled dual-carriageway highway connecting central Dakar with development zones and the national highway network to the east (Brocklebank, 2014:30). According to Graftieaux (2017:902), the project's total cost (including all components, not only the toll road) was anticipated to be USD\$760 million, with the road infrastructure accounting for USD\$462 million. However, the project faced serious challenges and difficulties which caused delays. Despite the difficulties in designing, implementing and managing an effective partnership with a private entity, the project also had to deal with the social and environmental consequences of the

construction, as well as co-ordinate a diverse group of stakeholders with sometimes conflicting priorities (Gainer, 2016:2).

There were other factors and challenges that brought about serious delays to the DDTH project, although positive outcomes were born out of these challenges. The project was made possible largely due to a comprehensive compensation plan that included the construction of a new town to assist some of those who had to relocate as well as the upgrading of low-income settlements along the toll road (Graftieaux, 2017:898). This project is expected to produce positive financial results. In terms of current value and tariffication, this toll road will generate at least FCFA2,256 billion in income over the next 30 years (Ndiaye, 2017:3). SENAC S.A., as a project company, is formed to build, operate and maintain (BOT) the toll road and then transfer it back at the end of the concession period (Graftieaux, 2017:902). The next section reviews PPPs.

2.7 TECHNOLOGY AND INFRASTRUCTURE USED IN TOLL ROAD CONCESSIONS

Various technologies and infrastructure methods are being used to improve the efficiency and conditions for toll road concessions.

2.7.1 Road Pricing System as the Means of Toll Road Concessions

McKindlay (2013:3) describes road pricing as part of a remedy to minimise traffic congestion, help in financing much-needed road infrastructure and enhance the efficiency of road use. In essence, the road pricing system is a tolling system although it differs from the conventional toll road system. A road pricing system, unlike toll road systems in other countries, charges motorists for using the road based on the amount of congestion they are causing (Menon & Guttikunda, 2010:1). Initially, the road pricing system (congestion and electronic road pricing) were intended to reduce congestion in cities around the world and later some elements of it were extended to distance-based charging on a large-scale toll road network due to its efficiency, technology and ability to improve road infrastructure. This study only focused on congestion and electronic road pricing, and ignored marginal social cost pricing (First Best Pricing) because Sorensen and Taylor (2006:112) argue that, despite the conceptual merits of

marginal social cost pricing of roads, a number of technical restrictions have, until recent years, made such ideas impractical.

2.7.1.1 Congestion or Value Pricing

It is important to mention that this type of toll road pricing model is not yet applicable in Africa, or in SA. Congestion pricing promotes the usage of other modes of transport (such as public transport, etc.) to reduce emissions and this squarely impacts the economy. According to Cheng, Xing, Yi, Liu and Fu (2019:1), congestion pricing as a form of tolling is often recognised as an important economic instrument. Wang, Wang, Xie and Zhou (2018:1); Abulibdeh, Andrey and Melnik (2015:62) and Amorima, Lobo, Rodrigues and Couto (2014:880) further allude that congestion pricing is a policy that involves charging motorists a user fee for utilising certain lanes in order to reduce the impact of congestion and encourage investment into cleaner, more efficient public transport systems while also protecting the environment. Congestion pricing on toll roads is merely intended to minimise traffic congestion, which in turn has adverse costs for motorists. According to Clements, Kockelman and Alexander (2018:1) and Lindsey and Verhoef (2000:1), traffic congestion enforces the following adverse costs on motorists: greater fuel consumption and vehicle wear, a reduction in travel time, inconvenient rescheduling of trips or usage of alternative modes of transport, reduced speeds and increased travel times, and over the long-term, expenses to relocate homes and businesses.

A fuel tax will continue to be the primary source of revenue in the medium term but its long-term viability is in doubt (Mbara, Nyarirangwe & Mukwashi, 2010:157). This form of taxation (fuel levy) imposed on motorists proved to be uncertain for the long-term and less effective in capping the traffic congestion, hence the introduction of congestion pricing on toll roads with an advanced electronic collection system. Congestion pricing has gained popularity as a result of advancements in electronic toll collection (Buxbaum, 2009:4). According to Amelsfort and Swedish (2015:7), congestion pricing may not improve the situation for the average driver but it does benefit business trips, freight, couriers and taxis in the sense that the direct gains outweigh the charges. Again, the average driver can benefit and be disadvantaged at the same time by congestion pricing. In support of this notion, Abulibdeh (2017:203) and Pike (2010:4) assert that congestion pricing penalises the average driver for

operating vehicles at highly congested times and locations, and at the same times benefits the average driver by improving air quality and decreasing greenhouse gas emissions. This form of toll road pricing has a direct influence on the decision of motorists in the sense that they can decide on which route to travel during peak or off-peak periods to save time, and based on affordability. Congestion pricing on high-demand roads aims to influence motorists' route choices, modes of transport, trip timing and destination selections to keep cars moving and prevent excessive traffic congestion (Clements et al., 2018:1; Parma & Lindsey, 2009:1). However, the downside of congestion pricing is that the concessionaires might increase the user-charges without proper justification. Even in cases where congestion is not a challenge, privatisation of public freeways will inevitably result in prices that exceed the marginal cost of infrastructure (Swan and Belzer, 2007:6).

2.7.1.2 *Electronic Road Pricing*

The search for a more efficient technology began in earnest in the early 1990s as a result of the limitations of manual road pricing methods (Chin, 2005:14; Fleming, 2012:10). This search led to the discovery of electronic road pricing (ERP). Electronic road pricing is a type of toll collection system that uses a variety of technologies to automate the toll collection process so that subscribers are not required to stop or slow down to pay toll fees. According to Menon and Guttikunda (2010:1), in September 1998, Singapore became the first country in the world to use an ERP system. In recent years, the ERP charging system has been used in other countries around the world. Tjandra, Nugroho and Utomo (2016:1) allude that ERP has been employed to lessen traffic congestion in Singapore, London and Stockholm. Rizal, Maulina, Purnomo and Febrian (2017:13) further state that ERP is often used in large countries where traffic congestion is a major issue. With such rapid expansion over the years, cities around the world have noticed the advantages of using ERP, and these advantages are as follows:

- to minimise traffic volume on heavily used roads and toll roads;
- to charge motorists a fair price for using the roads by billing them based on how often they use them; and

- to reduce human error on the operations since the gantries are effectively managed and controlled by a central computer (Land Transport Authority (LTA, 2017:Online).

With reference to the advantages above, the price charged to motorists is fair since the usage is voluntary according to whether it is in the peak hours or non-peak hours of the day. Electronic road pricing is not labour intensive as there is less human activity at the gantries since the user fees are collected electronically. This is all possible due to the technological advancements provided by ERP.

Table 2.4: Characteristics of Traditional Toll Road Concessions versus Road Pricing Systems

Traditional Toll Road Concessions	Road Pricing Systems
Toll road fees are not differentiated by time of the day	Road pricing system fees are differentiated by time of the day, during peak hours
Uses distance-based charging	Uses single city charging
User fee tolling	User fee tolling
Does not provide flexibility for when and where to travel based on the user fee charging	Provides flexibility for when and where to travel based on the user fee charging
Encourages higher car occupancy	Encourages higher car occupancy
Encourages public transport usage	Encourages public transport usage
Reduces travel time	Reduces travel time
Reduces traffic	Reduces traffics
Reduces emissions	Reduces emissions

Source: Researcher

Table 2.4 shows the differences between traditional toll road concessions and road pricing systems based on two aspects, namely differentiation by time of the day and charging (distance based single city charging). There are similarities on all other aspects of these two systems.

Lastly, it is important to highlight that ERP is a highly politicised issue and this inhibits the rollout of toll roads as a means of assisting governments to close the infrastructure deficit created by a lack of resources and funding. Politicians are frequently hesitant to jeopardise their political chances for an ERP system that is not guaranteed to succeed (Rouhani, 2016:1). Due to the timelines from approval to completion, politicians resist implementing ERP because of red tape and bureaucracy, since their goal is to achieve short-term gains. In addition, politicians are far more hesitant to choose ERP due to organisational loopholes (Rouhani, 2016:1). The Victoria Transport Policy Institute (2014) states that, to integrate ERP systems in its project financing packages, the appropriate ERP agency must have approval from many levels of government, resulting in bureaucracy and red tape.

2.7.2 Toll Road Revenue Collection Methods

The toll road collection methods, as a form of electronic billing, have evolved overtime and have played a critical part in the collection of user fees for toll roads globally. Without them, the toll roads infrastructure would collapse since there will be no resources to maintain and sustain the infrastructure. Collection methods must also keep up with the vehicle congestion on the toll roads and this important issue has direct bearing on collection technology. The improvements to toll road collection technology started with the introduction of manual toll collection (also known as cash toll collection) which was followed by electronic toll collection (ETC). In later years, the industry saw the introduction of open road tolling (ORT) which was more recently replaced by all-electronic tolling (AET). This study did not consider manual toll collection because it is an obsolete technology although still in use in parts of the world. This study therefore only focused on ETC and AET. Toll road collections have gone through three stages as follows:

- ETC lanes at toll plazas: In the initial stage, toll roads (or toll bridges or tunnels) set aside one or more lanes for individuals using transponders allowing them to circumvent queues at cash toll booths and get through the toll plaza more quickly. This began in the mid-1990s.
- ORT: In the second stage, toll roads removed toll booths entirely for transponder users enabling them to bypass the toll plaza at normal highway speed. This began in the early 2000s.

- AET: In the third stage, toll roads replace toll plazas with overhead gantries at tolling points which have mounted transponder antennae and camera equipment. For users without transponders, almost all these AET systems include a pay-by-plate option. All vehicles pay their tolls at highway speeds using AET (Poole. Jr, 2014:5).

2.7.2.1 Electronic Toll Collection (ETC)

According to Sampooram, Sunder and Saranya (2018:407) and Satyasrikanth, Mahaveer and Dileep (2016:247), the ETC system has proven to be a viable alternative to the traditional manual toll collection (MTC) system used at tollgates. The MTC is the most basic form of toll collection, in which the toll fees are collected by a collector working from a booth, and the ETC system is a good solution to MTC in that the stoppage time at the tollgates is reduced to enable the free flow of traffic. The ETC is a technological system that allows cars to pay toll fees electronically and it has mostly replaced live toll collectors at toll booths (Madhav, Reddy, Raj, Anvesh & Srikanth, 2012:436). Kalantri, Parekar, Mohite and Kankapurkar (2014:2582) further allude that using radio frequency identification (RFID) tags mounted on the vehicle, enables the ETC to automate the toll collecting procedure and shortening long queues at gantries. Due to the increasing number of cars passing through toll plazas, a manual system to collect toll fees is time consuming due to a lengthy line of vehicles waiting to cross the toll plaza, and as a result, the ETC system is used to reduce tollgate waiting periods and congestion (Abdulla, Abdillahi & Abbas, 2018:1602; Sampooram et al., 2018:407; Rodrigo & Hewage, 2015:1; Kamarulazizi & Ismail, 2010:70).

To improve its efficiency on toll roads, ETC deploys RFID technology. RFID consists of a transceiver and a tag, and this tag can be passive or active, and each tag has its own unique identification number (Chapate & Nawgaje, 2015:46). RFID tags are transponders that respond to queries from a reader by wirelessly transmitting a similar identifier or serial number (Jechlitschek, 2013:3). This technology (RFID) has being in existence for a long time and is not new. The "identification friend or foe" system (IFF) was the first application of RFID technology and was first deployed by the British army during World War 2 where transponders were installed in fighter planes and tanks, which could be queried by reading units to determine whether to attack or not (Jechlitschek, 2013:3). Table 2.5 shows different ETC payment methods.

Table 2.5: Electronic Toll Collection Payment Methods

Type	Description
Prepaid	As you set up a prepaid account with the toll road authority, your toll amount will be deducted automatically from the amount deposited when you pass through your exit interchange. Once you have reached the minimum balance on your prepaid account, you should recharge it again.
	Pay your toll at the exit toll gate using your own smart cards (prepaid toll cards/debit cards).
Post-paid	Create an account with no upfront payment. When you drive on the toll road, each toll fee is charged separately to your nominated credit card.
	Open an account with no prepayment. Drive through the toll road and get an invoice for your accrued tolls at the end of the month, which you may pay at the end of the given credit period.
	Drive through the toll road, then pay your toll with a credit card using the toll authority's online website or free mobile app within 48 hours.

Sources: Rodrigo et al. (2015:5)

Based on Table 2.5, ETC provides two options for payment methods depending on the preference of the road user, and both options are designed to benefit motorists. Dhurat, Magal, Chheda and Ingle (2014:73); Madhav et al. (2012:436-437) and Persad, Walton and Hussain (2007:3) assert that ETC has the following benefits:

- Increasing toll booth service turnaround rates, which results in shorter or fewer queues at toll plazas;
- More efficient and faster service (no more hand exchange for toll fees);
- The ability to make payments by keeping a balance on the card itself;
- Post-paid toll statements are used (no need to request receipts);
- Toll collection costs are lowered;
- Other general benefits include reduced emissions and minimised fuel wastage;
- A centralised and consolidated user account provides better audit control; and
- Increased capacity without constructing additional infrastructure.

In addition to the benefits mentioned above, Kalantri et al. (2014:2582) state that ETC provides devices for theft prevention and detection of traffic offences such as signal breaking avoidance (SBA), vehicle theft detection (VTD) and tracking over speeding vehicles. However, ETC, like any other toll road collection method, has disadvantages,

and these include incorrect reads, job losses, account tampering, financial losses, theft of stolen tags, monetary losses for companies and fines for motorists (2020:Online).

2.7.2.2 All Electronic Tolling (AET)

Non-stop toll collection is enabled by the use of an AET system, which is an element of information and communication technology (ICT) (Rodrigo & Hewage, 2015:4; Madhav, Reddy, Raj, Anvesh & Srikanth, 2012:436; Kalantri, Parekar, Mohite & Kankapurkar, 2014:2582). This electronic tolling system completely eliminates the need for staff at the tollbooths or gantries. It therefore eliminates human interaction between the motorists and live attendants to save time and reduce congestion on the toll roads. As a consequence, an AET substitutes the staffed toll booth with an automated system that scans small RFID tags on vehicles traveling at highway speeds (Cantelli, 2009:2). According to the Massachusetts Department of Transport (2016:2-3), AET has the following benefits for toll roads:

- **Safety:** Toll authorities around the country report higher rates of rear-end incidents than other types of collisions, in part because toll plazas pause high-speed traffic to collect fees on a regular basis. With the introduction of AET, these rear-end incidents are significantly reduced;
- **Congestion:** The removal of toll booths eases travel and reduces congestion at entry plazas, and this is due to the introduction of AET;
- **Environmental benefits:** The reduction in idling and acceleration/deceleration caused by tollbooths has saved between 500 and 2,500 gallons of fuel per day (200,000 to 875,000 gallons annually), resulting in a reduction of up to 7,800 tons of greenhouse gas emissions per year. This reduction is due to the introduction of AET; and
- **Reduced Operating Costs:** The elimination of cash tolls diminishes the need for toll collectors and this enables the reallocation of personnel resources to more critical duties such as toll road infrastructure maintenance and capital projects. All these improvements are due to the introduction of AET.

The improvements stated above enable toll road users to save large quantities of fuel and also reduces the number of rear-end collisions which are common at tollbooths. From a business point of view, particularly for concessionaires, the improvements

brought by AET reduce the personnel costs in the sense that the live attendants (toll collectors) are removed from the process. In broad terms, there are two general approaches to AET from a payment option standpoint (New Hampshire Department of Transport, 2017:11):

- **Transponder only:** All users of these facilities will be required to have a transponder. A driver who uses the facility without having a valid transponder account is regarded as a violator. Using DMV data, the license plate images of violators are compiled for invoicing and violation letters are sent out in accordance with agency business rules.
- **Transponder and video tolling:** This is the most prevalent approach to payment alternatives with AET. These facilities, like "transponder only" facilities, take an image of the license plate of any vehicle that passes by without a valid transponder for identification purposes. The most significant distinction is that all drivers are considered "customers" in "transponder plus video" facilities.

Unlike other toll road collection methods, the two abovementioned AET payment options completely remove the need for toll booths with toll collectors from the equation. Any motorist without a transponder on the toll road is labelled a violator which opens legal loopholes and places the concessionaires in a vulnerable position. The toll roads with transponder plus video facilities are less legal prone since they are customer friendly in terms of legal terminology or jargon. The next section deals with the maintenance of the toll road concessions.

2.8 THE MAINTENANCE OF PHYSICAL INFRASTRUCTURE (ASSETS) OF THE TOLL ROAD CONCESSIONS

Burningham and Stankevich (2005:2) characterise maintenance as minor repairs and upgrades aimed at eliminating the source of defects and averting excessive repetition of maintenance efforts. While the government should be the driving force behind constructing and maintaining road infrastructure, it is alarming to note that construction and maintenance are often overlooked due to the absence of co-ordinated planning and financing (Bratland, 2010:40). In the context of toll road concessions, the principals and agents must ensure that the maintenance investment is available and well spent in order to save significant future costs. Due to ever-

increasing traffic volumes and ageing toll road infrastructure there is a need for maintenance. According to Vassu and Lazim (2016:60), due to a lack of maintenance an unplanned and unforeseen stoppage might occur, causing irrecoverable losses and damages, and forcing organisations to incur additional expenditures such as paying overtime to staff (Vassu & Lazim, 2016:60). The consequences of a lack of maintenance should serve as a trigger to force the principals and agents to implement preventive maintenance since it is cost effective and more reliable than corrective maintenance. Moghaddam and Usher (2010:271) revealed that preventive maintenance involves maintenance tasks such as monitoring, inspection, lubrication, cleaning, adjustment, alignment, replacement, repair and maintenance of toll road infrastructure before failures occur. In terms of cost, Moghaddam (2010:1) alludes that preventive maintenance entails a fundamental trade-off between the costs of performing maintenance activities and the cost savings realised by lowering the overall rate of occurrence of infrastructure defects. For example, in South Africa the government gave SANRAL legal powers to work hand-in-glove with the concessionaires to mitigate the cost of maintenance for the toll roads. As a result, the road agency should have more discretion in allocating maintenance contracts to private companies who might be permitted to collect tolls to fund maintenance costs (Bunningham et al., 2005:2). The maintenance activities performed on toll roads are discussed below:

2.8.1 Routine works

Iowa Department of General Services (2003:4-2 of 8) defines routine works as the expenditures for the regular maintenance of physical assets (land, buildings and equipment) which includes periodic, preventive and ongoing maintenance required to postpone or prevent essential and non-critical building systems and equipment from failing. The routine maintenance is important because it is based on routine (daily, weekly or monthly) inspections of the condition of toll roads to ensure that small problems are not ignored but rather dealt with before they become big problems. The concessionaire or agent should take into consideration the following when awarding the contractor routine work:

- Associated cost for a certain item of routine work;

- The extent to which a toll road's life can be improved as a result of the enhancement;
- Contractors' capabilities and resources; and
- Contractor's total contract value for the year (Department of Transport and Main Roads, 2017:2).

According to the conditions mentioned above, the concessionaire should evaluate and determine the cost of routine work before the work is outsourced to a contractor. Therefore, before routine work is given to a contractor, the concessionaire should do the due diligence in determining the contractor's capability and resources to ensure the successful completion of the work. After the contractor has completed the maintenance, the concessionaire should inspect the work for quality assurance purposes.

According to Au-Yong, Ali and Chua (2016:5), there is a necessity to make a relationship comparison between the maintenance performance and the routine maintenance of toll road infrastructure. This comparison will assist in checking if the routine work done by a contractor for the infrastructure repair meets the expectations as set out in the performance contract. These expectations could include whether the contractor fixed the defects and damage to bridges and other structures, completed pothole patching, drainage, roadside vegetation maintenance and also whether the contractor cut and filled slopes.

2.8.2 Periodic works

Depending on the kind of toll road, periodic maintenance is based on comprehensive inspections conducted at specific time intervals such as seasonally or yearly. According to Altamirano, Äijö and Virtala (2007:2) periodic maintenance refers to the administration of the road and the planning of activities necessary to restore the road's original state by repairing road damage and thereby significantly altering the asset condition. Despite the thorough planning of activities, there are other costs associated with periodic maintenance beyond the maintenance cost. Not only are there expenses associated with maintenance, but there are also costs associated with production losses during maintenance. (Grigoriev, Klundert & Spieksma, 2006:783).

Due to the period and scope (which sometimes includes redesigning of various structures and facilities on the toll roads) of periodic maintenance on toll roads, its cost exceeds that of the routine maintenance. In supporting this notion, Burningham et al. (2005:2) assert that periodic maintenance is more costly than routine maintenance and needs particular identification and planning for implementation, and even design in certain cases. It is important to remember that if routine maintenance is performed on a regular basis, such as timely pavement patching, camber/super elevation maintenance and side drain maintenance, the need for periodic maintenance can be postponed. (International Labour Organisation (ILO), 2014:3).

2.8.3 Emergency or urgent works

According to the Department of Transport and Main Roads (2017:2) and the ILO (2008:15), emergency works on road networks are actions conducted in response to an emergency situation. This can happen at any time without prior warning. It is therefore important that concessionaires have an emergency budget in place to cater for unplanned toll road repairs. Urgent maintenance is conducted for repairs that are unforeseeable but must be addressed immediately, such as collapsing culverts or landslides that obstruct a road (Burningham et al., 2005:2). When these repairs are undertaken on toll roads, it is essential to create a temporary safe passage for vehicles. The ILO (2014:3) posits that the urgent requirement is to reopen the toll road for safe passage and then plan and provide for the restoration of the road to its former (or better) state/condition. The restoration of toll roads to their normal operating conditions requires a high degree of efficiency to allow for the free flow of traffic since the country's economy and tourism is heavily reliant on the efficiency of toll roads. In the context of toll roads, efficiency is defined as the ratio of outputs (lane distance of new road) to inputs (expenditures on labour, capital and land) (Taylor, 2010:8). It is impossible to foresee the frequency but emergency maintenance requires immediate action.

2.9 THE COSTS RELATED TO A TOLL ROAD CONCESSION

In general, the transport industry has adverse consequences to the environment through the release of harmful gases and death by means of vehicle accidents. The roads also bear the brunt of high traffic volumes which result in the deterioration of the road infrastructure. Therefore, there should be costs attached to mitigate all of these

consequences, and one of the mitigating strategies in terms of costing, is the introduction of the toll fee structure.

2.9.1 Pollution Costs

Vallero (2015:1) and State and Smart Transportation Initiative (2011:3) allude that the cost of premature deaths, illness and other effects of different toll road-related pollutant emissions are used to measure and quantify air pollution costs. The emission caused by cars on toll roads result in unintended outcomes in which human health is adversely affected. According to Marsden and Bell (2001:1), on a local and national sphere, road traffic is a major source of pollution emissions, since road traffic releases toxic gases into the environment. Gelete et al. (2018:2) allude that during 2003, the transportation industry produced approximately 24% of worldwide CO₂ output, and for members of the OECD, this figure was considerably higher, more than 29%. In supporting this notion, the European Environment Agency (2008) posits that in 2006, road transportation accounted for 39.4% of NO_x (nitrogen oxide), 36.4% of CO (carbon monoxide) and 17.9% of NMVOC (non-methane volatile organic compounds) emissions in EU countries. According to the EEA (2015; 2016), the most updated surveys were conducted in Europe in 2013. Zaldei, Camilli, De Filippis, Di Gennaro, Di Lonardo, Dini, Gioli, Gualtieri, Matese, Nunziati, Rocchi, Toscano and Vagnoli (2017:532) report that the road transport sector generates 46% of the total annual NO_x emissions, 23% of CO emissions, 15% percent of primary PM_{2.5}, 12% for primary PM₁₀ and 10% of nmVOCs.



Source: OECD (2014:35a)

Figure 2.3: The Economic Cost of the Health Impacts of Air Pollution from Road Transport: Three Links in the Chain

With reference to Figure 2.3, road transport has created unintended consequences globally. One of these consequences comes in the form of air pollution which causes changes in the climate. Climate change may drive mass migration in some areas, putting additional strain on already worn and aged infrastructure in urban areas (USAID, 2013:3). Abdul (2015:9) further states that climate change also raises the cost of designing, construction, rehabilitation, maintenance, operation and repairs for transportation infrastructure. Air pollution also has a negative impact on the health of citizens and this has a direct effect to the economy because the labour market will lose working days due to the high number of sick workers. A significant amount of the national budget has to be spent on health in order to mitigate the effects of air pollution. On the other hand, economic growth carries with it an increase in vehicle ownership and vehicle kilometres travelled, as well as bringing a societal demand for tougher pollution controls (OECD, 2014:37a).

2.9.2 Road Damage Costs

Visser (2015:998) states that because of wear and tear from use or the weather, all kinds of infrastructure require restoration. As noted in the first factor mentioned above (use), the usage of toll roads by vehicles with overloading capacity contribute to the deterioration and damage of the road infrastructure. In supporting this argument, Hanif, Ahmed, Saeed and Bai (2016:487) and Roux, Sallie, Nordengen, Ras and de Franca, (2005:1-1) allude that overloaded vehicles not only increase the risk of accidents on the road (due to reduced stability and braking efficiency) but they also expedite the deterioration rate of the road network and raise maintenance expenses, making many of the roads less safe for other road users (potholes, rutting, etc.). Martin (1994) further argued that heavy vehicles were responsible for 50% of toll road maintenance and 45% of construction and replacement costs. It is also important to mention that every vehicle that uses the toll road, despite whether it is a heavy-duty truck with a heavy load or is a small vehicle with a light load, they all contribute to the damage and deterioration of the road. In support of this notion, the Council for Scientific Industrial Research (CSIR) (1997:4) posits that every vehicle that travels over a road causes some deformation of the road structure.

The second factor mentioned above (climate) also impacts negatively on the quality and life span of the toll road, which comes in different forms such as flooding, extremely hot sun, etc. Flooding is a serious threat to toll roads as it may cause significant traffic obstruction and damage to toll road structures, resulting in long-term consequences (Buren & Buma, 2012). The CSIR (1997:4) further alludes that on bituminous surfaces, sunlight causes a continual, gradual hardening process. As a result of the abovementioned causes of damage to toll road infrastructure, the following road damage costs are formed:

- Operating costs borne from natural disasters which are due to incidents such as climate change and severe weather;
- Maintenance costs borne from natural disasters and routine activities such as cleaning drains and rehabilitation activities; and
- Improvement costs for safety enhancement to reduce the number of incidents during severe weather (Brathen, 2001:69).

The money spent on the abovementioned road damage costs (operating, maintenance and improvement) should be viewed as an investment that is identical or equivalent to the construction of new roads (Ognjenovic, Ishkov, Cvetkovic, Peric & Romanovich, 2016:957). It is sometimes not easy for toll road agencies to generate the necessary money and funds for this sort of maintenance caused by natural disasters due to incidents such as climate change and severe weather. Toll road agencies around the world are working to develop more effective income generating strategies so that maintenance, rehabilitation and reconstruction (MR&R) treatments are not postponed needlessly or unnecessarily (Hanif et al., 2016:487).

2.9.3 Accidents Costs

Roux (2016:i) alludes that a significant number of road traffic crashes (RTC) and their repercussions have a substantial effect on South African society, hampering socio-economic progress and negatively impacting the well-being of all South Africans. It should be noted that RTC is a global phenomenon that affects every country in the world, not only SA. According to the Ministry of Transport (2017:iii), in general, road accidents cost society intangible, financial and economic damages. All these accident costs indicate the type of traffic management system and quality of the toll road the

country has since they (crashes or accidents) have a direct bearing on the cost of total annual crashes. The accident cost as measured by the cost of total annual crashes changes as a result of a toll road project (Qin & Cutler, 2013:60). The RTC cost estimation comprises of three main cost categories, namely:

- Human casualty costs: loss of future and current productivity, medical and funeral expenditures, workplace re-occupation, grief, pain, suffering and a loss of quality of life are all cost items in this category;
- Vehicle repair costs: towing, damage to goods, assessor costs, vehicle repair and vehicle hire are five cost elements linked with vehicle repair expenses; and
- Incident costs: costs related to the RTC incident and not to vehicles or persons, and the six cost items are: RTC clean-up and scene attendance, RTC reporting, analysis and data capturing, RTC reconstruction and investigation, time delays, excess fuel consumption and emissions due to congestion, legal costs and infrastructure damage costs (Ministry of Transport, 2017:1; Roux, 2016:27-31).

These costs create long-term physical and emotional pains to road users, and in some instances the costs extend to a vehicle in terms of the costs associated with the repairing of the vehicle. Since accident costs are difficult to measure and the accuracy of accident rate data is debatable, these costs have been left out in most of the user expenses calculated for project construction or planning (Qin et al., 2013:60). Below are discussions on the important matters facing road concessions.

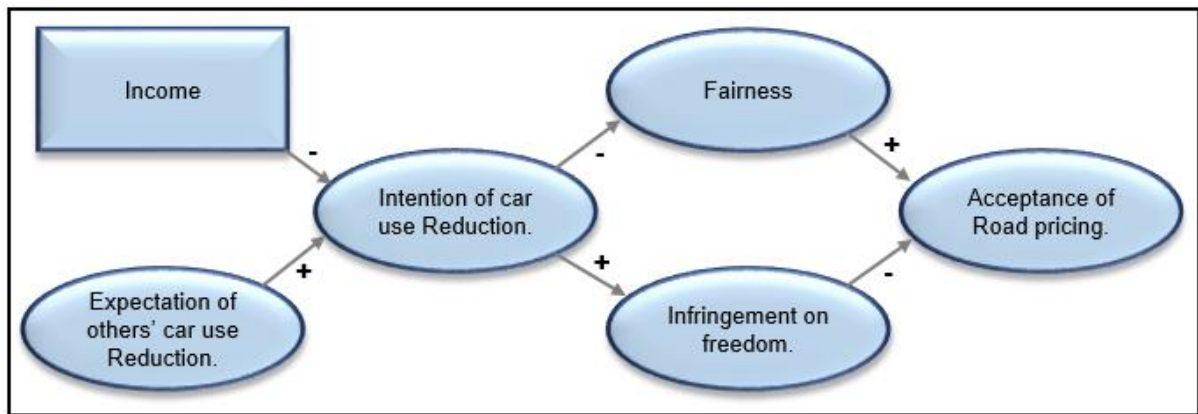
2.10 CONSIDERABLE ISSUES FACING TOLL ROADS CONCESSIONS

Toll road concessions are faced with multiple challenges, such as resistance from different stakeholders for various reasons. These reasons range from acceptability of toll roads to alternative routes. Another significant issue for toll road concessions is revenue generation.

2.10.1 Public Acceptability of Toll Road Concessions

Toll roads are frequently misunderstood as a form of double taxation (Bull et al., 2014:4). To counter any misunderstandings regarding toll road taxation or pricing, there should be a series of proper engagements with the public to address issues of concern for the purposes of convincing the public to accept toll road pricing. Most importantly, acceptability is not something that is constant or fixed but rather it might vary intra-personally (within individuals), inter-personally (between individuals) and chronologically (over-time) (Musselwhite & Lyons, 2009:2). As a result, it is critical for political leaders to ensure that the public is informed of the relative costs, rewards and risks of PPPs comparatively to traditional procurement (OECD, 2012:2(b)). Clearly, public acceptability of toll road pricing is a gradual process that requires a social compact between road agencies and the public, and this process should be deemed fair by all of the parties involved. In terms of fairness for toll road pricing, the income levels of road users are at the centre of the road pricing debate. Firstly, Small (1992) argues that road pricing is primarily helpful to high-income users since these users are relatively sensitive to the value of time (VOT) and are prepared to spend money to save time. However, when surveying Europe and North America, Mahendra (2008) found that road pricing is beneficial to both high-income users and low-income users.

The public acceptability of toll road pricing includes other critical issues beyond fairness and levels of income (affordability). The most crucial reason for public opposition towards toll road pricing appears to be moral or social freedom of choice (Jakobssona, Fujii & Garling, 2000:153). Freedom of choice is deeply entrenched in the minds of the public in free societies and the public wants to see such a principle being applied to toll road pricing. The main challenge of toll road pricing is a drop-in support due to perceived infringement on freedom. People believe they are giving up their freedom by paying for something that was previously free (Seale, 1993).



Source: Jakobsson et al. (2000:154)

Figure 2.4: Proposed Theoretical Model of Determinants of Acceptance of Road Pricing

The above proposed theoretical model articulates a complex and difficult situation of balancing competing priorities, income, fairness, freedom and car use reduction in an attempt to secure public acceptance to toll road pricing. Common sense would dictate that at first the public would naturally resist the toll road pricing. However, acceptability has improved in areas where toll road pricing has been introduced (Gehlert, Nielsen, Rich & Schlag, 2008:111). The other priority cited in Table 2.4 is that for the public to accept toll road pricing they should have a choice to use public transport, and this is important for environmental issues because the reduction of car usage is a goal. Jones (1998:275) concluded that in terms of revenue usage, research from public opinion polls in the United Kingdom show that road pricing will not be widely accepted unless the money collected is hypothecated for local transportation and environmental initiatives. It should also be noted that divergent views from other stakeholders (including non-users) should be considered. Non-users, those who view congestion and pollution to be very serious, those who believe existing conditions are unacceptable and those who perceive road pricing to be effective were found to be more accepting to the costs (Jaensirisak, Wardman & May, 2005:127). From an economic point of view, the community might oppose the introduction of toll road concessions on the basis that they take away traffic from their businesses which will negatively impact their quality of life. People who live along the 'old' route have openly expressed their displeasure with the implementation of toll road concessions, claiming that the tolling redirected more traffic from the 'old' road to the new toll road, thereby lowering their quality of life (Meyer, Breitenbach & Kekana, 2008:1).

Public consultation and participation in the toll road pricing decision-making process is important in that this will be viewed as transparent by the public and increase the acceptance. Policymakers should provide the information required to aid in the shaping of the public's perspective, thus ensuring that road pricing decisions are transparent and based on trust and making the prices as predictable as possible (Victoria Transport Policy Institute, 2014). The public's perception of PPPs is that they entail active stakeholder consultation and engagement as well as end-user participation in project development and subsequent service quality monitoring (OECD, 2012:2(b)). Transparency and trust will go a long way in shaping the public's willingness to pay for toll roads. A willingness to pay for certain goods or services by users is informed by the level of transparency in pricing (Transport and Main Roads, 2011:2.3).

2.10.2 Creation of Alternative Roads to Toll Roads

According to Ragas (2018:22), providing an alternative free road appears to be a compensating approach to counteract resistance to toll roads that do not consider all of the implications and repercussions. The necessity to give an alternate free route was stated by the Ministry of Transport, Communication and Infrastructural Development official as 'an outdated idea that is not applicable to Zimbabwe (Mbara, 2010:165-166). Although Zimbabwe does not currently have toll road concessions, the statement by the official was controversial because providing the alternative free road (alternatively known as "shunpiking") to motorists is a requirement and precondition for toll roads. Dismissing the alternative route concept undermines the necessity for a toll system to provide choice, equity and fairness for road users, since road users have varying levels of affordability (Mbara et al., 2010:166).

This principle of an alternative free road is also practiced on other tolling systems such as the congestion and electronic pricing models. A great majority of these tolling systems are managed lane schemes in which users may choose between a selection of managed lanes that require a toll and a selection of unmanaged lanes that are always free to use (Gocmen, Phillips & van Ryzin, 2015:2). In situations where multiples of perfect substitute or alternative roads exist, rates would be determined competitively where marginal revenue, marginal cost and price would all be equal (Swan et al., 2007:6).

2.10.3 Revenue Risk

Traffic risk refers to the possibility that actual traffic volumes will be lower or higher than the initial forecasts and this can lead to a loss in revenue (Bull et al., 2017:5). Traffic projections or forecasts are difficult to measure or predict and the revenue results may be lower than anticipated in the initial revenue forecasts (Bull et al., 2017:34). When the revenue results are lower, improvements to existing toll road infrastructure and debt servicing are adversely impacted due to the lack of funds. However, a comforting fact according to Mbara et al. (2010:156), is that global ratings have shown that toll roads as an asset have had comparatively low default rates. Despite the challenges posed by low revenue due to poor and inaccurate traffic forecasts, the toll roads should still serve their purpose. Tolling has been used as a traffic management tool as well as a revenue-generating technique (Mbara et al., 2010:156).

There are other factors that contribute to the low revenue of toll roads and all these factors can render toll roads useless. These factors exist because toll road systems are prone to toll evasion, revenue leakages, toll avoidance, ticket swapping and congestion (Zhou & Chilunjika, 2013:190). Some of these factors (ticket swapping, toll evasion and avoidance) are equated to toll road fraud and violation and the electronic fee collection (EFC) is used to mitigate these factors. EFC fraud is defined as any conduct aimed at avoiding the electronic collection of fees by tactics that are prohibited by the rules or laws that apply to the network in question (Expert Group 3, 2005:13). In assisting in the mitigation of low revenue, toll roads should employ the revenue generation methods mentioned below:

- **Revenue-maximising:** Revenue-maximising recovers as much of the toll facility's costs for operation and maintenance as possible (Bull & Mauchan, 2014:4). This type of revenue generation method ensures strict monitoring on the facilities, resources, financial spending and operation costs in order to maximise profit. Revenue maximising is the same as maximising short-term profit (Gocmen et al., 2015:2).

- ***Welfare-maximising:*** Welfare-maximising recovers a contribution of the toll facility's maintenance and operating costs while maximising the social and economic benefit of the infrastructure (Bull et al., 2014:4). The society in general should benefit in more than one way from the toll road facility. Road Pricing (RP) schemes should be applied when high-quality travel alternatives such as biking lanes, public transportation, ridesharing, walking facilities and other services are available (Rouhani, 2016:9).

According to the above information, opportunities must be maximised in order to increase profits and ensure that the public gets some level of benefit from the toll road concessions, and these can be achieved through fair pricing, shortened distance and time travelled. The next section distinguishes between the advantages and disadvantages of toll roads.

2.11 THE ADVANTAGES AND DISADVANTAGES OF TOLL ROAD CONCESSIONS

Toll road schemes are more expensive for road users than obtaining revenues through a fuel levy or taxes but the funds are received more quickly (Pienaar, 2012:700). The building of roads infrastructure is expensive and therefore governments are prompted to switch to toll road schemes which are more costly for road users. However, before any toll road schemes are developed, the private sector should first raise the required capital. Due to its stronger credit rating and lower cost of financing, the private sector could raise the required capital sooner than the public sector (Haiden, 2003:4). Despite these issues, toll roads can provide high-quality improvements to road networks. Toll roads contribute to a high-quality road network that enhances road safety by reducing travel time and lowering operating costs (Kekana, 2006:2). Table 2.6 provides the advantages and disadvantages of toll roads.

Table 2.6: Advantages and Disadvantages of Toll Road Concessions

Advantages	Disadvantages
Toll roads generate additional revenue that would otherwise be unavailable	There are costs (such as direct and indirect costs) associated with collecting tolls
A precise form of user charges is provided by toll roads	Toll roads may appear to be a kind of double taxation
The public is generally prepared to pay direct user fees	Toll roads may cause concerns with equity
Toll roads allow a project to be completed faster than it would otherwise be	
Toll roads offer a steady stream of revenue for maintenance and operations	
Toll roads, once built, can be used to manage congestion and travel demand	
Toll roads provide more opportunities for PPPs	

Source: Crabtree, Wallace and Mamaril (2008:5-6)

Complimenting the advantages of toll road concessions, Samuel and Poole, Jr. (2007:28-34) allude that the long-term concessions give rise to:

- greater capital access;
- flexibility in toll rates;
- cost-cutting; and
- geographic specialisation and diversity.

The long-term benefits of a concession project outweigh those of the short-term contract. This is evident from the perspective of cost saving, as well as the concessionaire can be flexible in terms of toll fees. The next section focuses on the international perspective on toll road concessions.

2.12 THE REVIEW OF PUBLIC-PRIVATE PARTNERSHIPS

PPPs are adopted when the government decides to contract the private sector to build or renovate the infrastructure because of a financial constraint. Hall (2008:2) posits that PPPs were created to address government borrowing restrictions, and they

entailed using a private entity to borrow money, build a new road and then operate it for a number of years, recouping the investment and profit through toll fees during the whole term of operation. As a result, the private sector's involvement or role in PPPs might vary depending on the instrument employed, whether through a direct equity, challenge fund, mezzanine loan, loan, venture fund, syndicated loan, frontloaded or innovative fund (Byiers, Große-Puppendahl, Huyse, Rosengren & Vaes, 2016:3).

2.12.1 The Advantages and Disadvantages of PPPs

PPPs are guided by three principles: (1) the government has the ability to provide public infrastructure to the general public; (2) in terms of profitability, the private sector can gain significantly; and (3) it is possible to obtain reasonable community pricing for infrastructure services (Berawi, 2019:1). These three principles give rise to advantages that PPPs have over traditional procurement. These advantages are provided below.

- PPPs are expected to be less expensive in the long term because they rely on the experience of private partners;
- PPPs can be more effective and responsive because of the private partners' knowledge and expertise;
- The property will still belong to the public sector at the conclusion of the contract period, irrespective of the expenditures made by the private parties because the public sector owns the facilities and private partners are responsible for maintaining them;
- The project will be finished on time and within budget. The delivery standards can be improved due to the introduction and implementation of business incentives;
- Private entity will impart to the public sector the necessary expertise, skills and knowledge; and
- It can benefit the project and society because the private partner's personnel perform better (Mitchell, 2007:23).

Based on the aforementioned information, the key advantages of PPPs are that private partners ensure that the projects are completed within a set schedule and within budget due to the terms and conditions of the contract. When compared to traditional forms of procurement, PPP projects have a better track record for delivering assets on time and on budget (European PPP Expertise Centre (EPEC), 2015:6; Burkhanov & Atamuradov, 2013:104). Due to the private partners' expertise and experience, PPPs are more responsive and efficient and the users can afford them in the long term. Transfer of skills and knowledge from the private to the public sector takes place, the quality and standard of infrastructure is improved or maintained, and at the end of the concession period, the asset returns to the public sector becoming public property once again but with improved quality. The disadvantages of PPPs are highlighted below.

- Both partners must be extremely vigilant in their monitoring;
- Politically vulnerable, yet in desperate need of political support;
- PPPs may be subjected to complex laws, legislations and policies; and
- Public and private partners must be fully empowered and capable (Mitchell, 2007:23).

Further to the above information, Nwangwu (2019:36) alludes that PPPs are inherently political and contentious owing to the fact that they involve the transfer of public control and operation of public assets to a private entity. As a consequence, a lack of political will can derail the success of a PPP in the sense that some sector of society might not appreciate the divesting or transferring of public control and assets to a private company which in the long-term could have been beneficial to them and the government. The PPP legislations, laws and policies are ambiguous and cumbersome and usually derail the completion of the PPPs due to confusion faced by the partners in interpreting the legislations, laws and policies. As a consequence, PPPs must be built on a long-term political commitment, a solid policy foundation and a stable and robust regulatory and legal environment (Farquharson, de Mästle, Yescombe & Encinas, 2011:5). Lack of experience and expertise in matters surrounding PPPs can jeopardise their progress. A lack of experience and expertise creates uneasiness due to a deficit of trust amongst the partners and these issues increase the likelihood for unhealthy relations and rivalry.

2.12.2 The Rationale for Pursuing PPPs

The citizens have particular expectations for infrastructure from their governments and these expectations give credence to a governments' justification for the use and adoption of PPPs. Once citizens have succumbed and accepted the use of PPPs after the governments' justification, the reasons below will be at the top of that justification list:

Table 2.7: Reasons for the public and the private sectors to undertake a PPP.

Reasons for the public sector to undertake a PPP	Reasons for the private sector to undertake a PPP
• Lower overall costs and lower initial expenditures to keep a government's budget deficits to a minimum; • Scarcity of managerial and technical knowledge and expertise in the public sector. Greater productivity and creativity in the delivery of public services owing to the private sector's management and technical skills and expertise, which gives PPPs a surplus over traditional projects, which are fully financed by the government; • Wish to reduce the load on taxpayers by increasing user fees whenever necessary; and • The introduction of competition between private-sector entities, which fosters cost-cutting and high-quality service provision.	• Opening up markets that had previously been monopolised by the public sector, resulting in the creation of new investment opportunities; and • Collaboration with the public sector provides long-term guarantees and assurances, which encourage private enterprises to embark on initiatives that would be too risky under normal circumstances.

Source: Ahadzi and Bowles (2004:968); Landow and Edbon (2012:729); Van Ham and Koppenjan (2002:597).

Based on Table 2.7, the initial capital investment is critical for public sector in the rollout of a PPP project. The approach used to raise this capital investment differs from country to country. Concerned that a low level of public investment over a number of years may harm the economy's long-term performance, the UK implemented the so-called "golden rule" in the mid-1990s, allowing it to borrow capital to fund PPP infrastructure and other capital projects (Akitoby, Hemming & Schwartz, 2007:3). The cost of borrowing finance for PPP infrastructure and other capital projects should be properly handled. It is crucial to know whether higher private financing costs are

attributable to other issues like inefficiencies, weak competition, liquidity restrictions or constraints (EPEC, 2015:26).

In mitigating the shortage of public sector's managerial and technical skills in PPP projects, the private sector should assume a critical role. The private sector should participate in public-private consultations as part of the PPP framework to assist with identifying the present skills demand, anticipate future skills needs, enhance matching with skills supply and adjust skills production accordingly (Somma, 2013:32). These initiatives by the private sector will assist in greater productivity and innovation in the delivery of public services.

In the context of the private sector, PPPs create opportunities that were traditionally the sole competency of the public sector. This is achieved by de-monopolising social infrastructure projects and entering into contractual partnerships with the private sector. Akitoby et al. (2007:3-4) state that countries with high levels of public debt and countries that are susceptible to macroeconomic shocks must match commensurate increases in public saving with the increases in public investment by obtaining additional income such as through tax hikes or shifting spending priorities.

2.12.3 Collaboration and Long-Term Relationships between the Public and Private Sectors

The partnership concept implies reciprocal control, with a careful balance between autonomy and synergy which necessitates shared accountability, equal decision-making participation, mutual respect and transparency (Brinkerhoff, 2002:216). Collaboration between the partners of a PPP should include the above stated characteristics in order to successfully implement PPP projects using the knowledge and expertise of their respective field of work. Interreg Central Europe (2017:11) supports this notion by stating that PPP partners are mutually and jointly engaged in its execution, which means they share the project's obligations and each partner takes on the responsibilities that are more appropriate for their area of competence.

PPPs are a special form of collaboration between the government and private firms (Forrer, Kee, Newcomer & Boyer, 2010:477), and Friedman (2016:28) further states that the establishment of relationships is one of the first steps to closing the gap between the partners of a PPP arrangement. This relationship should be reciprocal,

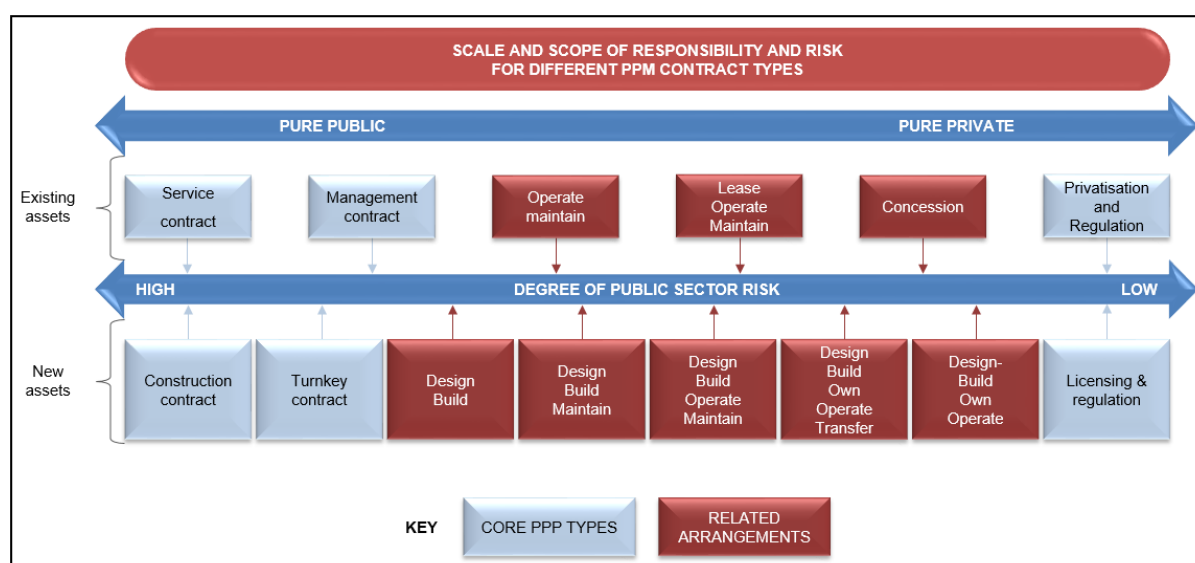
were both the public and private sectors benefit. The presumption is that governments and private entities should work collaboratively in a relationship, where governments gain access to technical expertise and knowledge and can determine the cost-effectiveness of private delivery, and the companies can share their expert knowledge in exchange for long-term service contracts (Forrer et al., 2010:477).

2.12.4 Distribution and Transfer of Risk

A PPP model allows a government to transfer risks to a private entity, relieving it of the responsibility of risks it cannot manage such as cost overruns, long-term asset maintenance and construction delays (Hovy, 2015:1). In this type of PPP arrangement where a significant amount of risk is being transferred to private partner, there should be a clearly articulated position from the beginning. The partners should begin their discussions by outlining the risks and identifying and agreeing on who is best positioned to be responsible for those risks in the relationship (Forrer et al., 2010:479). However, the risk transfer process during the contract review stage is typically subjective and exaggerated due to the challenges associated with assigning, defining and valuing risks (Froud & Shaoul, 2001). There is always a possibility to share the risk between the government and the private sector. This will depend on the level of negotiation between the two parties to share the risk.

The private sector has no idea that government agencies are not profit-driven and the government has no idea that the private entity wants to be paid for taking risks (Friedman, 2016:28). It is critical for both the public and private sectors to clarify their expectations from the start in order to make it clear to the other partner which level of risk the other partner is willing to take. Assigning risk to the entity that can best understand and manage the risk while maximising public benefit is the purpose of risk identification, allocation and negotiation (Hovy, 2015:2; Goldsmith & Eggers 2004, 141). Risk allocation should depend on which partner has the knowledge, skills and resources to best mitigate and manage the risk (Forrer et al., 2010:480). However, in South Africa, the PFMA Act, of 2004, demands that a substantial portion of the risk be placed on the private sector.

Transferring a significant amount of the risk to the private partner does not eliminate the public entity's risk entirely. Greater transparency in the private sector would reduce exposure to the public sector's risk. A poorly structured PPP may end up posing substantial risk to the general population in the form of decreased accessibility, poor service or potential fiscal liabilities (Jomo, Chowdhury, Sharma & Platz, 2016:4). Another risk factor for the government is that it has to provide a partial guarantee to the private sector in order for funding by lenders.



Sources: Roehrich, Lewis and Gerard (2014)

Figure 2.5: Variations of PPPs and distribution of risk

Design and construction risk, technical risk, operational and maintenance risk, financial risk, revenue risk, legislative risk, force majeure, political risk, uptake patronage, environmental risk and risk of commissioning are the common types of risk (Grimsey & Lewis 2002). It is imperative that the cost charged by the private sector considers the common types of risk stated above. Hence, good risk analysis, value for money (VFM) evaluation, strong competition and consequently, good contract management are critical (EPEC, 2015:26). In instances where risk is not clearly defined and justified, some degree of misleading might occur. It is also probable that the government may overprice the risk component and overcompensate the private sector for taking it on, thereby raising the cost of PPP in comparison to direct government investment (Krugman, 2012).

Table 2.8: Forms of PPPs Risks

RISKS	EXAMPLE
Political	Change in laws, delays in project permits and approvals, inconsistency in government policies, fragile government, and the installation of new regime.
Construction	Land acquisition, costs overruns of construction, delay in construction time, unreasonable variation of contract/contractual risks, failure of the contractor, project delays, inability of the consortium, resettlement and reconstruction, poor standard of workmanship, insolvency/default of subcontractors and suppliers, and change of scope.
Legal	Changes in tax regulations, corruption and non-compliance with laws, changes in industrial regulations, and import/export regulations.
Economic	Volatility in interest rates, volatility in inflation rates and poor financial markets.
Operation	Costs overrun of operations, higher than anticipated maintenance costs, technology risk, material waste and default of operation.
Market	Change of tariffs, market demands and material cost fluctuations by either the government or the private sector.
Project Finance	High cost of financing, lack of credit worthiness, lack of government guarantees, delays in annuity payments, and reluctance from financial institutions to take on high risks.

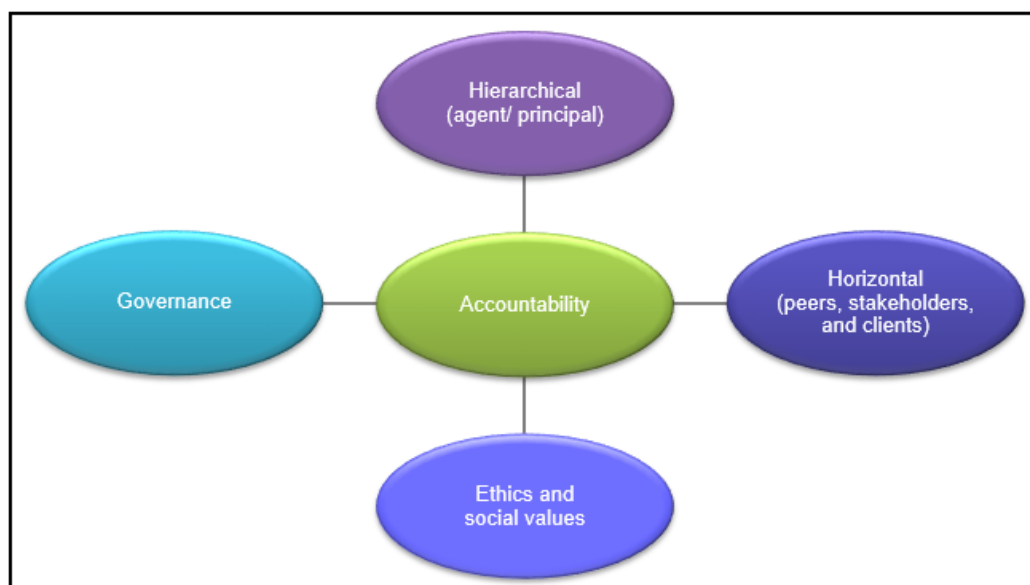
Source: Karim (2011:13).

In accordance with Table 2.8, Balcioglu (2017:4-5) mentions the risks that are transferred to the private sector such as finance, design, construct and maintain might be frustrated by issues like unclear macro economic policy, lack of political will, cost overruns during the operation phase, political instability, inability to obtain credit, etc. When considering all of these factors, it is worth mentioning that under-performance by all parties involved in the PPP project can lead to a much more onerous risk profiling by lenders. As the availability of credit decreases, lenders expect higher returns and more onerous conditions for the risks they are asked to assume and their risk tolerance decreases (Farquharson, 2011:3). The downside to this is that PPP projects that rely heavily on user fees could be adversely affected. This could impact whole sectors of the market. User demand-based PPP projects can struggle to increase funding compared to projects that rely on government funds for the provision of a service (Farquharson, 2011:3).

2.12.5 Accountability in Public-Private Partnerships

By engaging private entities in the government decision-making process and program implementation, PPPs alter the dynamics of public accountability (Forrer et al., 2010:477). By being a part of the PPP, the private partner becomes part of the decision-making process which is traditionally the competency of the government alone. Since a PPP allows accountability to be shared between a government and a private entity, it is important that each parties' roles and responsibilities are clearly defined. Well-structured PPPs create clear lines of accountability and transparency to increase performance (Sarmiento, 2010:3). It is therefore necessary that both the government and the private sector acknowledge and accept accountability for their responsibilities. Accountability is related to the duties, obligations, requirements and conditions agreed by both parties (Forrer et al., 2010:477).

Demirag and Khadaroo (2011:275) posit that accountability is related to the execution of responsibilities and being answerable to them. Executing responsibilities should also be done in an ethical manner in order to complete the principle of accountability. According to Dubnick (1998:80), as an analytical tool, accountability is intricately linked to issues of ethical behaviour.



Source: Fombad (2013:13(a))

Figure 2.6: Approaches to accountability in PPPs

The aforementioned approaches are critical in holding the principal and agent accountable in a PPP project. There are three main dimensions that are useful for understanding accountability in PPPs, as provided below (Fombad, 2013:4(b)).

- The hierarchical perspective in the context of PPPs refers to a framework in which individuals believe they are accountable for reporting, justifying or explaining their activities to others, as well as being subject to consequences in the case of errors or weaknesses;
- The horizontal component of accountability, also known as expectation management, offers a practical and pragmatic method to understanding accountability in public-private partnerships; and
- The virtue of accountability refers to having a conscience or moral responsibility for one's actions.

According to the above information, the first-dimension deals with how the agents and principals within a PPP report back to civil society in terms of performance and actions in a democratic society where answerability is demanded. The second dimension emphasises the clarity of expectations from partners in the PPP contractual arrangement and this involves the on-going readjustment of goals and objectives. The third dimension revolves around providing a rationale and justification which informs one's decisions for actions taken with regard to PPP infrastructure projects.

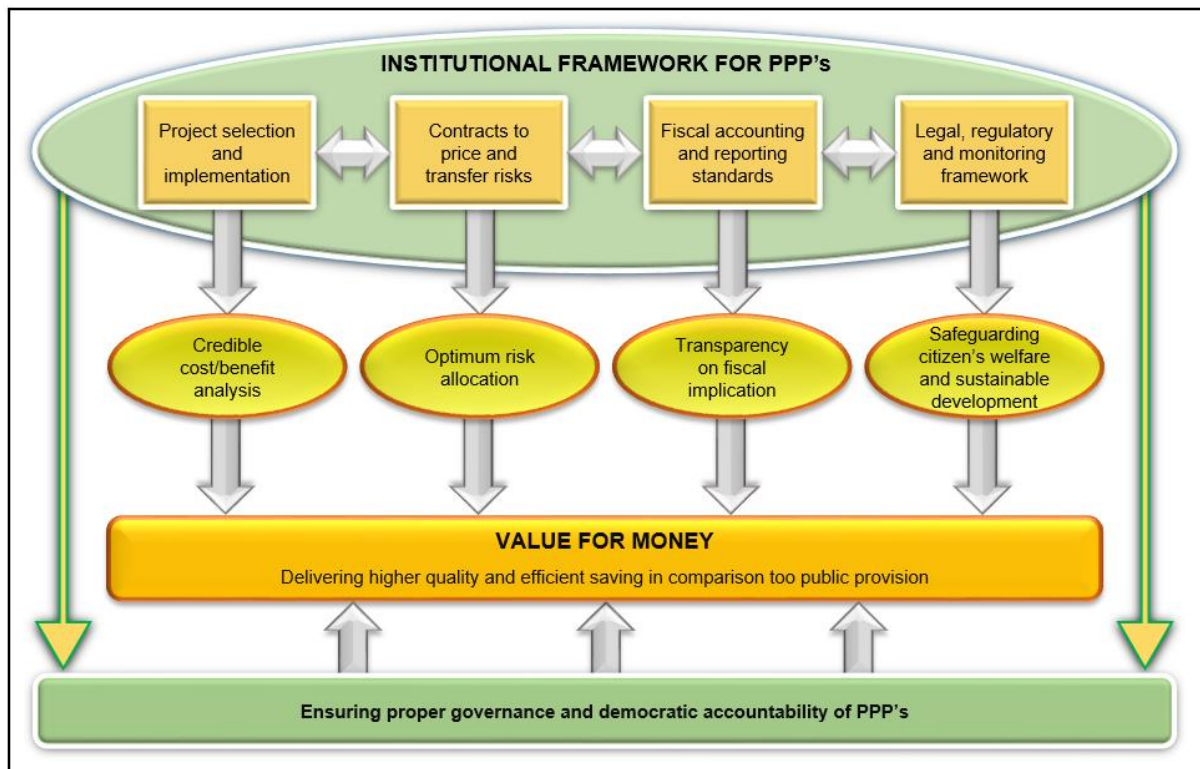
2.12.6 Providing Value for Money

There are numerous reasons why governments should pursue PPPs but achieving improved value for money (VFM) is the most important (Grimsey & Lewis, 2005:2). It is therefore important for every PPP to have a VFM component. VFM is described as the best combination of life cycle costs and product or service quality (or fitness for purpose) in order to meet the user's needs (US Department of Transport, 2012:1-2). Erlendsson (2002) defines VFM as an evaluation of whether an entity, within the resources available to it, has achieved the full value or maximum benefit from the products and services. In reference to these two definitions, VFM is not about accepting the lowest initial pricing but rather about the quality of service or goods. However, cost and affordability play an important role in the decision-making. A properly implemented VFM enables the public sector to make informed decisions on

the basis of comparing the costs and risks of a conventional delivery method with the costs and risks of a PPP (Friedman, 2016:53). Jomo et al. (2016:12) further state that at a fundamental level, VFM would take into account both the cost of a PPP and the quality of the service. In order to justify the PPP, it would need to be compared to how these criteria would have fared in the public sector. The following are the six primary factors of value for money:

- risk transfer;
- the nature of long-term contracts (life cycle costs included);
- out specification;
- competition;
- incentives and performance appraisal; and
- the management skills of the private sector (Anderson, 2000).

Based on the information above, the VFM is considered standard when a significant risk component of the project is transferred to the private partner. Another requirement for VFM is achieved when the performance of a private partner can be measured, and if the performance is satisfactory, the appropriate incentive can be handed out. The management skills brought into the project by the private partner are considered beneficial when the project's specification is achieved in time and the project cost is kept within budget.



Source: Jomo et al. (2016:17)

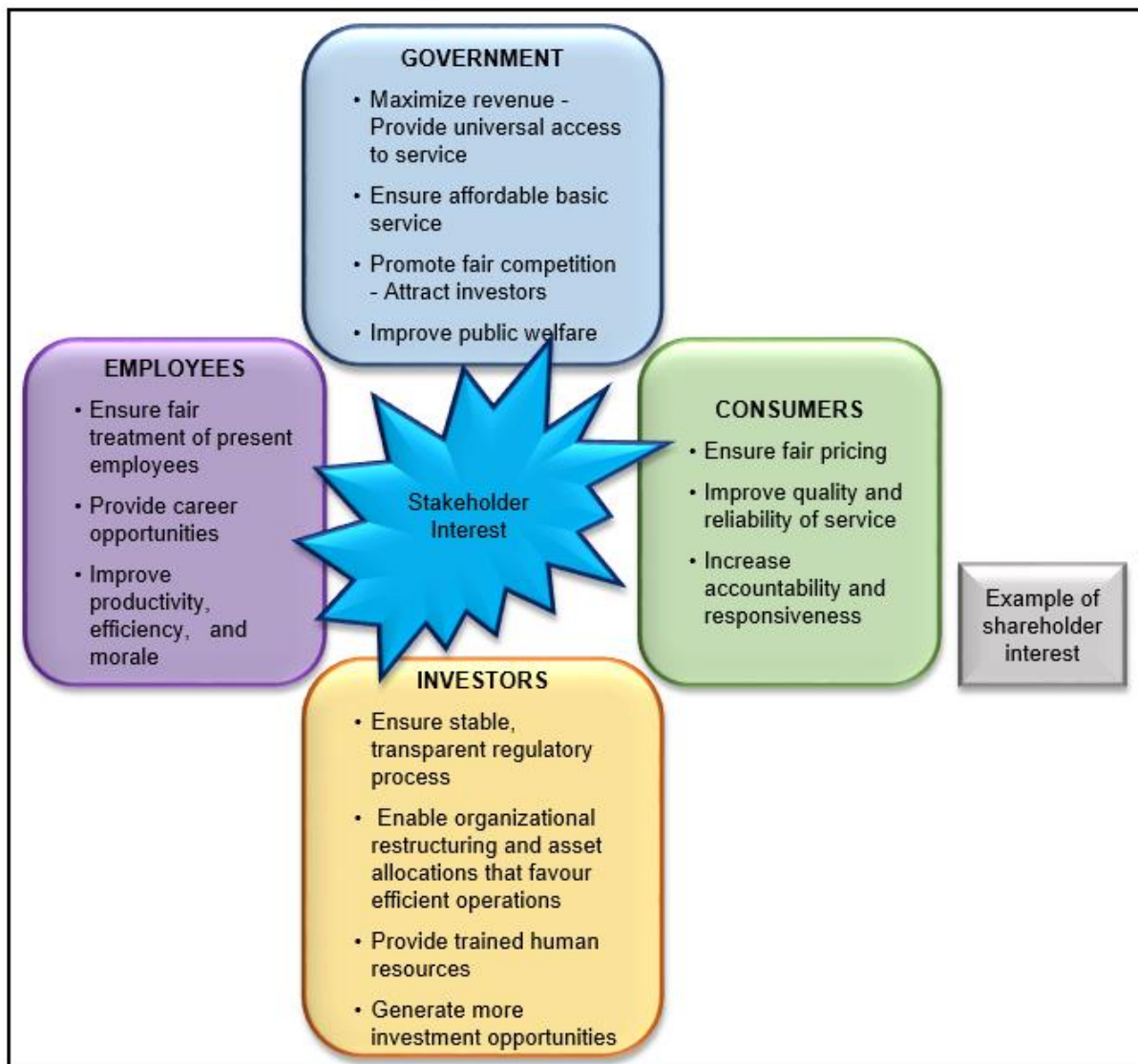
Figure 2.7: Key components of an enabling institutional framework for PPPs

According to Figure 2.7, more accountability and efficiency are expected in the realisation of VFM by means of PPPs. In achieving the accountability and efficiency for better VFM, the process should include credible cost, optimum risk allocation, transparency on fiscal implications and safeguarding citizens' welfare. Most importantly, this question should be asked: Does the project as a whole offer good value for money when compared to a traditional procurement?

2.12.7 Stakeholder Interests in PPPs

The use of the word 'stakeholder' cures this weakness of public opposition to PPPs not only because the phrase includes a broader range of project influencers but also aligns the idea of including people impacted by the project (Nwangwu, 2019:37). The concept of stakeholder interests attempts to mitigate conflict which is generated from a broad range of interests in a PPP arrangement. PPPs are then a coalition of powerful, yet sometimes opposing, individuals and interest groups (Wojewnik-Filipkowska & Wegrzyn, 2019:6). Andriof and Waddock (2002:42) allude that trust-based partnerships between individuals and/or social institutions with varied aims and

objectives that can only be realised collectively is how stakeholders' interests are managed. Figure 2.8 depicts the interest groups.



Source: Skilling and Booth, 2007.

Figure 2.8: The Range of Stakeholder Interests in PPPs

According to Figure 2.8, the government (public sector), in exercising its oversight role by supervising the project and acting on the behalf of the society (consumers), takes care of the overall benefits of the PPP project (Wojewnik-Filipkowska et al., 2019:6). These benefits involve ensuring affordability of basic services, improving public welfare and providing universal access to services. The private sector (private investors) must ensure that employees are adequately trained and generate more investment opportunities whilst generating a revenue stream through tolling fees. The employees must reciprocate with improved productivity and efficiency.

According to Nederhand and Klijn (2017:4), the stakeholders, such as the public and societal groups, have limited opportunities for participation due to the variety of rules that exclude them from the PPP tendering process. The public and societal groups, as part of the stakeholders, are mostly excluded at this point (tendering) of the PPP process due to the secrecy of the tendering. After the tendering process has been completed, the content of the PPP project is at least partly decided, and often strongly determined, and the participation and involvement of stakeholders can only result in slight or minor changes (Verweij, 2015). Two parties that are actively involved in this stage are the government and the private players, and this could be viewed as a means to disadvantage the public and societal groups further. First, they will not learn technical skills of tendering, and secondly, a lack of transparency at this stage of the PPP process might promote corruption which can create other stakeholder challenges. Challenges faced by stakeholders can lead to significant project delays, higher funding costs and even the cancellation of projects (United Nations General Assembly, 2010).

2.12.8 PPPs Contractual Renegotiation

According to Khallaf, Naderpajouh and Hastak (2016:2670) and Guasch, Benitez, Portabales and Flor (2014:9), a renegotiation of contracts for PPPs requires modifications, adjustments and changes in the original terms and conditions of the contract as opposed to an adjustment of payments (or tariffs) taking place under the mechanism defined in the contract. PPPs contractual agreements are usually long-term and complex in nature, hence modifications, adjustments and changes are inevitable in order to address contractual inadequacies. PPPs contractual renegotiations occur due to the inadequacy of the contractual agreement to manage contingencies (Cruz et al., 2013:116). In addressing these contingencies, two forms of renegotiations are used in practice. It is highly likely that contractor-led renegotiation will occur, particularly in the early stage of the concession, while government-led renegotiation is less likely to occur, and if any, it should occur at the middle stage of the concession (Xiong & Zhang, 2016:1).

Table 2.9: Definition of PPPs Renegotiation and Their Examples

Renegotiation is when:	Examples
i) A change in the risk matrix's assignment and/or the contract's conditions, or	• Scaling down or reduction on the service level; • Delayed or accelerated for several years; • Extending the terms of contract; • Guarantees reduction (financial bonds); • Increase the government's guarantee (in order to pay lenders); • Delays in tariff reductions (tolls); • Lower the contract's economic equilibrium's thresholds, etc.
ii) A change in the project's scope (if this was not regulated in the contract).	• Government requests for new investments; • Government fees being reduced.; • Insolvency of an ovoid operator; and • Changes on the scope of the contractual agreement, etc.

Source: Guasch et al., (2014:9)

Regarding changing the conditions of the contract without the renegotiation process or the adoption of a unilateral decision, Cruz et al. (2013:132) state that these changes affect the scope, investment plan, legal, indirect services, costs, prices, (e.g. new works) and terms and conditions of operation. However, the change in terms and conditions of the contract can be mitigated by including contingency clauses in the early stages of the contractual agreement to enable renegotiation at a later stage. According to Domingues and Zlatkovic (2014:2), flexible contracts can include contingency clauses that allow renegotiations of contracts after investments have been made and they also leave 'money on the table' that can trigger further renegotiations. On the downside, rigid contracts which disregard the renegotiation process lead to conflict. On the other hand, rigid contracts do not allow for adjustments or modifications by setting fixed terms before investments are made or by setting conditions for renegotiation on the basis of predictions of unpredictable events such as traffic volumes (Domingues et al., 2014:2). The rigid contracts disadvantage both

partners in the sense that when circumstances change, both partners are unable to adjust accordingly because of the terms and conditions of the contractual agreement. Therefore, it is important for the government to have experienced negotiators in order to protect public interests, and the private sector should also have good negotiators to safeguard its business interests.

It is worth mentioning two important facts about PPP renegotiation triggers when the government initiates renegotiation. There are three scenarios in which compensation changes: (i) a contract change is required by the public sector (unilaterally), (ii) actions of the public sector create a liability for the private partner and (iii) a change in a law has occurred that affects the profitability of the project (Yescombe, 2011). However, when renegotiation is undertaken by the private sector, it is generally when the financial conditions of the concession deteriorate in such a way that the private partner will fall into bankruptcy (Sarmiento & Renneboog, 2016:2).

Xing, Li and Li (2020:3) argue that the positive effect of renegotiation will be lost if the opportunistic behaviour in renegotiation is not managed well, and hidden dangers will be generated for the project. The opportunistic renegotiation disrupts the smooth running of the PPP project, however, the reasonable renegotiation brings issues into perspective and enable the PPP project to run smoothly for a longer period of time. The sustainability of PPP project benefits from fair and reasonable renegotiation but the opportunism of investors will influence the strategic selection of renegotiation (Xing et al., 2020:3).

2.12.9 Types and Models of PPPs

According to Interreg Central Europe (2017:41), models of PPPs vary primarily in capital asset ownership, investment obligation, risk assumption and contract duration. These differences are important since they distinguish PPP models from traditional contracting or public procurement. The most significant aspect that distinguishes PPP models from traditional methods is that a collaboration with the private entity occurs in both the construction and operation phases (Balcioglu, 2017:1). Therefore, PPP models vary from simple and short-term management contracts to very long-term and complicated contracts depending on capital asset ownership, investment liability, risk

assumption and contract duration (Mashwama, Thwala & Aigbavboa, 2017:231). Table 2.10 provides a discussion of PPP models.

Table 2.10: PPP Models and Descriptions

Name of Model	Description
Build, Operate and Transfer (BOT)	For a predetermined period, the agreement comprises the outsourcing of responsibility for building, funding, maintaining and running a single facility by a private partner. The authority reverts to the public entity at the conclusion of that contract period.
Design, Build, Finance and Operate (DBFO)	Typically, the private partner is responsible financing the project during construction. Before the commissioning of the asset, the government purchases it from the developer for a pre-determined cost and assumes all ownership risks.
Build, Operate and Own (BOO)	This involves giving ownership rights to an asset in order to enable design, funding, construction, ownership, operating and maintenance. The asset is held solely by the private partner, which keeps operating and ownership revenue risks without transferring it to the public sector.
Design and Build (D/B)	In this model, the private partner designs and constructs the project to fulfil the public owner's performance criteria and conditions for a specified, not to be surpassed, or guaranteed price ceiling. The project is funded by the government, but it avoids the additional expenditures of separate design and construction contracts.
Design, Build, Operate and Maintain (DBOM)	The contractor is accountable for all four aspects of the contract. The contractor is usually compensated from the revenue obtained during the operating phase of the built facility.
Design, Build, Finance and Operate (DBFO)	The contractor is in charge of the project's three main tasks (designing, constructing and operating). The contractor finances the entire project with their own capital. The contractor is reimbursed over the life of the project from the revenue generated from the built facility.
Design, Build, Finance, Operate and Maintain (DBFOM)	The built asset is owned by the government, and the contractor is responsible for designing, constructing, funding, operating and maintaining the asset. The contractor is reimbursed over the life of the project from the revenue generated from the built facility.
Design, Build, Finance, Operate, Maintain and Transfer (DSBFOMT)	The private partner takes responsibility for all project activities, particularly the project funding, and is compensated with revenue raised from the project. The contractor typically owns the facility for the duration of the PPP contract period. At the end of the PPP term, the private partner relinquishes the ownership, maintenance and accountability for the project.

Name of Model	Description
Build, Transfer and Operate (BTO)	The BTO and BOT models are identical, except that the project's operation and management is overseen by the government at the conclusion of the PPP project. The Private partner and the government engage into an agreement in which the private partner operates the built asset for a certain period of time.
Build, Own, Operate and Transfer (BOOT)	The Private partner manages the project for the term of the contract. Like the BOT model, the private entity may or may not be required to fund some, or all, of the project.
Design, Build, Own, Operate and Transfer	In this model, a government enters into a concession contract with a special purpose vehicle to design, finance, construct, own, operate and transfer an asset.
Lease, Develop and Operate (LDO)	Under a contract with the government, the private partner rents the asset from the government and uses the proceeds to expand it. The private entity gets reimbursed by the government for the use of the asset.
Concession	The government sells the right to operate and maintain an existing asset to a private partner. Typically, the length of concession lasts for a long time.

Source: Molokwane et al., (2021:213); Anopchenko, Gorbaneva, Lazareva, Murzin and Ougolnitsky (2019:2); Interreg Central Europe (2017:42-46); Alfen, Fischer, Liedel and Riemann (2009); Manchidi and Merrified (2001)

Based on the information above, Barro and Sala-i-Martin (2004); Hammond, Ralph and Keeney (2002) and Raiffa (1997) argue that a growing body of evidence points to the fact that most models for the reconciliation of public and private interests are based on decision theory, an interdisciplinary theory aimed at developing strategies and methods to help one or more people make an informed decision for the best available alternative. Interdisciplinary theory assists with decision making by addressing public and private interests in the PPPs. However, there is a shortage of PPP models that address public and private interests completely. The lack of a sufficient range of PPP models for successfully co-ordinating the interests of public and private sectors must be highlighted (Anopchenko *et al.*, 2019:2).

2.13 CHAPTER SUMMARY

This chapter delved deeper into the issues involving the toll road concessions, which are guided by the new public management, new public governance and principal-agent theories. From the literature it was discovered that toll road concessions are

faced with various challenges such as the acceptability of toll roads and providing alternatives routes to toll road concessions. Another prominent issue highlighted is the cost factor for toll road infrastructure which comes in the form of road damage, pollution and accidents costs.

It was also established from the literature that different types of road maintenance occupy a critical role in the preservation of toll road infrastructure, and that toll road technologies such as ETC, ORT and AET, assist with the flow of traffic and the collection of toll fees. The international perspective on toll road concessions was reviewed and Africa as a continent forms part of the review. According to the information gathered, every individual country has its own individual toll road dynamics. Types of road pricing for toll road concessions were also explained as they form part of the solution to reducing congestion, assist in funding the much-needed transport infrastructure and improve the efficiency of road use.

Lastly, this chapter focused on a literature review of PPPs and it distinguished between the advantages and disadvantages of different types of PPPs. Other PPP concepts such as risk distribution, value for money, contractual renegotiation, models, accountability and stakeholder interests were also thoroughly discussed in this chapter. The next chapter discusses PPP legislation, policy frameworks and regulations in South Africa.

CHAPTER 3

STATUTORY AND REGULATORY FRAMEWORKS GOVERNING PPPS IN SOUTH AFRICA

3.1 INTRODUCTION

The previous chapter focused on foundational and theoretical perspectives on PPPs as they relate to toll road concessions globally. This chapter presents an overview of the legal, strategic and policy frameworks for a PPP in the context of the toll road concessions in South Africa (SA). In SA, road construction and maintenance were the responsibility of local and provincial authorities until 1935, and they funded the roads through local tax revenue (Floor, 1985). After 1935 it became the responsibility of the national government to fund and finance roads of national significance (Van Rensburg & Krygsman, 2019:2). This transfer led to the formulation of the first legal road Act in South Africa, the National Roads Act, No. 42 of 1935, which saw the establishment of the first two road agencies, namely the National Road Fund (NRF) and the National Road Board (NRB).

The advent of democracy in SA saw the introduction of SANRAL and the National Roads Act, No. 7 of 1998, which replaced the National Roads Act, No. 42 of 1935. This newly introduced Act enabled the newly installed SA government to adopt PPPs in the form of toll road concessions. The adoption of toll road concessions enabled the SA government to rollout toll road infrastructure in partnership with the private sector. However, for toll road concessions to be implemented successfully, SANRAL and concessionaires have to abide by specific legislations, strategies and policies which are discussed below.

3.2 CONSTITUTIONAL FRAMEWORK AND RELATED LEGISLATIONS IN RESPECT TO PUBLIC-PRIVATE PARTNERSHIPS

Rendón (2015:1270) alludes that it is the responsibility of the state to guarantee fundamental rights. In the context of SA, the bill of rights, as contained in the constitution, is designed to guarantee that any infrastructure provided by means of a PPP is successfully delivered to the citizens. For the constitution to realise or achieve this, the Public Finance Management Act, Regulation 16 of 1999, and the National

Treasury PPP Practice Note Number 01 to 08 of 2004 must render support to the constitution.

3.2.1 Constitution of the Republic of South Africa Act, No. 108 of 1996

Section 9(3) of the Constitution of the Republic of South Africa Act, No. 108 of 1996, in terms of equality of citizens of South Africa, advocates that the state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth. It is therefore necessary for the state to provide infrastructure developments (particularly road infrastructure for the purposes of this study) to its citizens without discriminating against them based on the Constitution. The Constitution of South Africa of 1996 lays down the legislative responsibilities of various levels of government with respect to airports, roads, traffic management and public transport in order to direct the government towards the provision of infrastructure for its citizens (Pocket Guide to South Africa, 2015:206). However, the constitution recognises that for the state to achieve this mandate of providing infrastructure to its citizens without discrimination, PPPs is a critical tool out of many, hence the regulation below.

3.2.2 Public Finance Management Act, Regulation 16 of 1999

According to the OECD (2012:12(a)), South Africa defines a public-private partnership as a business agreement between a government entity and a private partner in which a private party either carries out an institutional function on behalf of the institution for a defined or indefinite duration, or acquires for a specified or indefinite period, the use of state property for its own commercial purposes. In the context of SA, this definition mentions the term “institutional function” which distinguishes this definition from other definitions in Chapter 2 (Subsection 2.3.1) of this study. In terms of a PPP for toll road concessions in SA, SANRAL, as the government agency, represents the government (principal) by entering into contractual agreements with private partners (agents: N3TC, TRAC and BPCC) on behalf of the government, and these agents, over a thirty-year period, must be responsible for managing the financial and physical (the roads) assets, revenue collection, shareholder equity and commercial debt. However, most importantly, all these responsibilities of the agents must be executed under the stewardship of SANRAL. SANRAL, as a principal, is expected to perform its

institutional function as set-out by the Public Finance Management Act, Regulation 16 of 1999 (PFMA). Clause 16.1 of PFMA refers to “institutional function” as: - (a) a service, task, assignment or other function that an institution performs-

- i. in the public interest; or
- ii. on behalf of the public service generally.

In ensuring that SANRAL performs the task and service on behalf of the public interest as part of complying with its mandate of institutional function, there must be service standards and specifications in place to guide SANRAL. The OECD (2012:1(a)) defines the outputs of PPPs to better match service requirements with customer needs (in particular public interest and service) and exert pressure on service providers to comply with service standards. In guiding SANRAL to meet these service standards and specifications, the National Treasury PPP Practice Note Number 01 of 2004 (Standardised PPP Provision), assists in this regard and is informed by Section 76(4)(g) of the PFMA. The standardisation process should take into consideration the inputs of civil society, and in support hereof, the OECD (2012:1(a)) argues that the participation of end-users in the monitoring and design of PPPs increases the possibility that the effort will be deemed valid, rational, fair and understandable. Fundamentally, in the toll road concession space in South Africa, SANRAL performs its institutional function by providing stewardship to concessionaires with respect to how they manage the financial and physical assets (the roads), revenue collection, shareholding equity and commercial debt.

Furthermore, the PFMA assists in the regulation and interpretation of each stage and phase of the PPP project cycle (roadmap). The PFMA should be read together with the National Treasury PPP Practice Note Number 01 to 08 of 2004 (also known as Module 1 to 9) which explains every phase of a PPP project cycle.

3.2.2.1 National Treasury PPP Practice Note Number 01 of 2004

The National Treasury PPP Practice Note Number 01 of 2004, contains standardised PPP provisions in order to guide and regulate PPPs infrastructural contractual agreements at the national and provincial government levels in SA. It is worth noting that SANRAL and concessionaires PPP contractual arrangements should meet the standards set-out by the National Treasury PPP Practice Note Number 01 of 2004.

3.2.2.2 National Treasury PPP Practice Note Number 02 of 2004

This PPP Practice Note is also referred to as Module 1 (South African Regulations for PPPs) and is intended to regulate all the PPP projects in the Republic of South Africa. By law, this regulation is applicable to constitutional institutions, government departments and public entities listed in schedules 3A, 3B, 3C and 3D of the PFMA. Therefore, the PPP arrangement amongst government departments (DoT and National Treasury), government agency (SANRAL) and agents (concessionaires) is covered under this regulation.

3.2.2.3 National Treasury PPP Practice Note Number 03 of 2004

This PPP Practice Note, also called Module 2 (Code of Good Practice for BEE in PPPs), speaks to Broad-Based Black Economic Empowerment (BEE) in the PPP space. Module 2 ensures that SANRAL and concessionaires embrace the participation and involvement of black contractors and service providers in the construction of toll road infrastructure through the application of the BEE policy. According to the Code of Good Practice for Black Economic Empowerment in a PPP (2004:6), BEE is a key component of South African PPP projects, each of which is structured on a combination of financial, technical and BEE components in order to achieve optimal value for money in government's delivery of infrastructure and services.

3.2.2.4 National Treasury PPP Practice Note Number 04 of 2004

This PPP Practice Note is also known as Module 3 (PPP Inception) and deals with the initial phase of a PPP project cycle. In relation to the toll road concessions in SA, this module outlines the initial phases of the project, empowers SANRAL to appoint a project advisor and register the PPP project with the National Treasury (PPP Unit). The module also provides SANRAL and concessionaires with guidelines on how to implement the Code of Good Practice for BEE in PPPs and for the procurement process of a transaction advisor.

3.2.2.5 National Treasury PPP Practice Note Number 05 of 2004

This PPP Practice Note is widely referred to as Module 4 (PPP Feasibility Study) which is the second phase of the PPP project cycle. With regard to the toll road concessions in SA, Module 4 assists SANRAL with the feasibility study process to better determine

whether a project is suited for a PPP or traditional (conventional) public sector procurement.

3.2.2.6 *National Treasury PPP Practice Note Number 06 of 2004*

After SANRAL has decided on a project method (PPP or traditional public sector procurement), it then enters into this PPP Practice Note commonly known as Module 5 (PPP Procurement). This module outlines the procurement process for a PPP to SANRAL and the concessionaires and it details the distinct stages to be followed.

3.2.2.7 *National Treasury PPP Practice Note Number 07 of 2004*

In ensuring that PPP projects between SANRAL and concessionaires are correctly implemented, this PPP Practice Note, known as Module 6 (Managing the PPP Agreement), plays a critical role. The module assists all relevant stakeholders involved in toll road concessions to manage the contractual disputes appropriately and within the contractual agreement. The first port of call in the event of a dispute between SANRAL and a concessionaire is intervention by the DoT and National Treasury.

3.2.2.8 *National Treasury PPP Practice Note Number 08 of 2004*

Operating the toll road concessions in SA involves a number of activities which form part of the revenue stream for the concessionaires, and this PPP Practice Note, also known as a Module 7 (Auditing PPPs), ensures accountability of resources and finances in the toll road concession sector. This module details the powers of the Auditor-General over SANRAL and the concessionaires in terms of performance, forensic audits and scope of financials. The next section focuses on policies that facilitate the delivery of social infrastructure in SA.

3.3 POLICIES PROMOTING SOCIAL INFRASTRUCTURE DELIVERY

A report by Deloitte (2010:1) found that three quarters of senior global business executives in South Africa believe that the social infrastructure will not be adequate to support their company's long-term development and growth. The policies discussed below attempt to address this.

3.3.1 National Development Plan 2030 (NDP)

The NDP (2012:44) recognises that South Africa has lost a century of capital investment in roads, rail, ports, electricity, water, sanitation, public transport and housing, and that spending on social or public infrastructure is at low levels by historical standards. In relation to a low capital investment in roads, the introduction of toll road concessions in South Africa serve to compliment and augment the government's effort of improving capital investment for roads in order to drive social and economic development. Chapter 4 of the NDP calls for economic infrastructure development to form the basis of social and economic development (Official Guide to South Africa (2018:2)).

The NDP (2012:159) further calls for South Africa to maintain and improve its social infrastructure (i.e. infrastructure for roads, electricity, water, transport and telecommunications) with a goal to foster economic growth and social development objectives. In the context of the roads in South Africa, there has been a poor record of maintenance and the expansion of roads has been slow, hence the introduction of toll roads concessions.

3.3.2 Draft Revised White Paper on National Transport Policy 2017

According to the Kwazulu-Natal Government DoT (2004:5), the White Paper on National Transport Policy 1996, identifies that a lack of sufficient transport infrastructure has a negative impact on the development of a sustainable transport sector for all modes of transport. Lack of sufficient transport infrastructure also includes road infrastructure. In its attempt to mitigate the lack of road infrastructure in SA, which was first identified in White Paper on National Transport Policy 1996, the Draft Revised White Paper on National Transport Policy 2017 (2017:34) articulates its mission for roads as follows:

“To allow the development and management of a road network that is safe for all its users, is well-maintained and serves as a catalyst for social and economic development.”

In achieving this mission, the Department of Transport (1999:60) states that, among other things, the development of a crucial strategic backbone road network is a major policy implementation target. The implementation of a major policy target is therefore necessary in the construction of a road network that is safe and well-maintained for social and economic development. In support hereof, the Kwazulu-Natal DoT alludes that the effective movement of road freight and public transport on national roads requires high efficiency and safety standards. This policy established the following findings in terms of road infrastructure (Draft Revised White Paper on National Transport Policy 2017, 2017:41).

3.3.2.1 Issue (*Finding 1*)

The policy document recognises the equal importance of the development and maintenance of pavements and that there is insufficient funding to maintain the existing road infrastructure which has resulted in a significant and growing road maintenance backlog nationwide. In addressing part of this finding, the researcher recommends that more toll road concessions be established to deal with the insufficient funding to maintain the existing road infrastructure with low investment costs for developing or constructing new roads for the country (Draft Revised White Paper on National Transport Policy 2017, 2017:41).

3.3.2.2 Policy (*Finding 2*)

Innovative ways to secure finance for the development of road infrastructure include build, operate and transfer (BOT) or fund, rehabilitate, operate and maintain (FROM) contracts that enable the government to obtain financing from private sources rather than the fiscus. The National Treasury is overwhelmed by a competing infrastructure backlog nationwide, therefore, the researcher recommends that the government should legislate for more toll road concessions to be established in order for SANRAL to expedite the rollout of these concessions by inviting a larger number of potential private partners with an appetite for risk to enter into BOT and FROM contractual arrangements. The strategy that facilitates road infrastructure in SA is discussed in the next section (Draft Revised White Paper on National Transport Policy 2017, 2017:41).

3.4 STRATEGY PROMOTING THE ROAD INFRASTRUCTURE IN SA

The rollout of road infrastructure is not easily achieved in certain parts of the world. One of the most complex issues facing developing countries is the provision of the appropriate infrastructure for their populations (Okosun, 2017:1). Some of the complex issues emanate from a lack of the resources and expertise required to construct the new roads or maintain the existing road infrastructure. In an attempt to mitigate these complex issues related to road infrastructure, the SA government developed the strategy below.

3.4.1 Road Infrastructure Strategic Framework for South Africa 2007

The SA government has always contributed significantly and meaningfully to the provision of road infrastructure (Department of Logistics-University of Stellenbosch, 2017:23). However, the infrastructure does not come cheap as it requires significant investment. Road infrastructure, which is usually a prerequisite for economic growth and effective logistic services, involves high upfront investment costs which are subsequently sunk costs characterised by the indivisibility of the investment (Department of Logistics-University of Stellenbosch, 2017:23-24). Therefore, the SA government has devised a strategy to address the massive task of rolling out road infrastructure, namely the Road Infrastructure Strategic Framework for South Africa 2007, which intends: *“To develop and implement comprehensive and appropriate interventions to ensure service delivery efficiency and sustainability in the road network system.”*

However, the strategy recognises that there should be a partnership approach to road network management which should be achieved in the form of co-ordination between the various levels of government. This strategy reveals the following challenges and solutions as shown in Table 3.1.

Table 3.1: Challenges and Solutions for Road Network Management

Chapters: Challenges	Summary of Solutions
Chapter 1: Introduction	• Introduction
Chapter 2: Institutional Arrangements	• Encourages co-ordination and a collaborative approach to the management of road networks. • Calls for the establishment of a roads co-ordinating body (RCB) that comprises of: - DoT, Provinces, National Treasury, Local Government Sphere, DPLG, SALGA. • Introduces conceptual delivery models that can be implemented by road authorities facing challenges in the efficiency of service delivery.
Chapter 3: Road Network Management	• Identifies the roles and challenges facing the road network system. • Encourages a cluster approach to the management of road networks, i.e. national roads, access roads, etc.
Chapter 4: Information Systems	• Emphasises the need for the development, management and harmonisation of information and decision support systems. • Reports on the state of the road network system, which is shown to be generally poor.
Chapter 5: Funding Sustainability	• Includes the discussion on road revenues vs. allocations. • Calls for the role of PPPs in the delivery of road services to be extended –beyond toll concessions.
Chapter 6: Human Capital	• Emphasises the need to analyse the problem in order to manage the problem – i.e. the importance of skills audits in addressing capacity shortages. • Demonstrates patterns of decline in engineering and related skills. • Encourages collaborations to build the required capacity.
Chapter 7: Future Perspectives	• Acknowledges a lag in road research in SA. • Proposes a research agenda for the roads sector: - Some of the areas include financing, technology, materials, environmental and social.
Action Plan	• A medium-term strategy to bolster the management of the road networks (5-10 years).

Source: Compiled by the researcher

Table 3.1 shows that Information Systems (chapter 4) reports that the condition of the road network system in SA is generally poor, and to the contrary, the Department of Logistics-University of Stellenbosch (2017:71) states that roads in SA receive a fair share of revenue when compared to other countries selected, and that SA lies in the top half when comparing revenue generated by the road sector to funds allocated to road network. This raises many questions, such as whether the funds allocated to relevant government entities and departments are being correctly spent, since there is evidence that the national government does allocate funds to these entities and departments. Roads are funded mainly by allocations from the national government to the various SOCs, local and provincial government (Department of Logistics-University of Stellenbosch (2017:71).

Maybe the contributing factor to this challenge, where funds allocated by the national government to the relevant government entities and departments are not being correctly spent, is due to the decline in engineering and related skills as mentioned in Table 3.1, Chapter 6 (Human Capital).

Another contributing factor to this challenge could be the lack of co-ordination and a partnership approach to road network management as mentioned in Chapter 2 (Institutional Arrangements) of Table 3.1, and until the establishment of the RCB (which coordinates the efforts of the DoT, provinces, the National Treasury, local government sphere, DPLG, SALGA) is achieved, the challenge may still persist.

Chapter 5 (Funding Sustainability) in Table 3.1, refers to toll road concessions as part of the solution to sustainability funding roads in SA. The expansion of the toll road concessions is seen as part of the solution but that other forms of PPPs should also be explored to ease the funding challenge in the road sector. In the next section, the strategies and legislation framework for toll road concessions in SA are discussed in detail.

3.5 LEGISLATION FRAMEWORK AND STRATEGIES ON TOLL ROAD CONCESSIONS

It is critically important that the public agency introducing and overseeing the concession appropriately plan the project and put together a fair contract which is financially appealing to the private sector and is detailed and clear in defining not only

its obligations but also the level of service required (Arata et al., 2016:345). The legislative Act provided below intends to protect and increase the risk appetite of the concessionaires.

3.5.1 The SANRAL and National Roads Act, No. 7 of 1998

The first National Roads Act, No. 42 of 1935, which was passed in 1935 by the Parliament of South Africa is being replaced by the SANRAL and National Roads Act, No. 7 of 1998. This Act empowers and mandates SANRAL to design, finance, maintain, operate and rehabilitate the national toll and non-toll roads in South Africa. Again, this Act enables SANRAL to achieve its main strategic goal, which according to the Pocket Guide to South Africa (2015:208) is to provide effective strategic road infrastructure for development, business, mobility and access facilitation. However, in some instances, SANRAL has to delegate its mandate to concessionaires in order to achieve its institutional function (mandate). According to Section 28(1) of the SANRAL and National Roads Act, No. 7 of 1998, SANRAL may enter into an agreement with any person in terms of which, that person, for the period and in accordance with the terms and conditions of the agreement, is authorised:

- a) to operate, manage, control and maintain a national road or portion thereof which is a toll road in terms of Section 27, or to operate, manage and control a toll plaza at any toll road; or
- b) to finance, plan, design, construct, maintain or rehabilitate such a national road or a portion of a national road, and to operate, manage and control it as a toll road.

The aforementioned information confirms the notion that SANRAL has the flexibility and option of transferring some of its responsibilities and mandate to concessionaires in order to achieve its institutional function. This happens when SANRAL transfers the national roads to the concessionaires which in turn convert them into toll road concessions. In terms of the contractual agreement, these concessionaires are expected to finance, design, plan, construct and maintain the toll road's infrastructure. According to the terms and conditions of the contractual agreement, SANRAL is expected to oversee the performance of the concessionaires. Section 28(2) of the

SANRAL and National Roads Act, No. 7 of 1998, further states that that person (the authorised person) will be entitled, subject to Subsections (3) and (4):

- a) to levy and collect toll on behalf of the agency for their own account (as may be provided for in the agreement)-
 - i. on the toll road specified in the agreement;
 - ii. during the period so specified; and
 - iii. in accordance with the provisions of the agreement only; and
- b) in the circumstances mentioned in Subsection (1)(b), to construct or erect, at their own cost, a toll plaza and any facilities connected therewith for the purpose of levying and collecting tolls.

Based on the above information, the researcher deduced that the concessionaires should collect toll fees for 30 years in order to service their debt and to maintain the toll roads, and that a predetermined portion of the toll fees collected will be given to SANRAL in accordance with the terms and conditions of contract. To construct or erect the toll road infrastructure, the concessionaires access finance from lenders, hence they have to service the debt, and this is one of the reasons toll fees increase annually according to the Consumer Price Index (CPI) adjustment.

3.5.2 SANRAL Strategy Horizon 2030

The SANRAL Strategy Horizon 2030 has three pillars of focus, and of the three, this study will only focus on the 2030 stakeholder pillar. This pillar encourages the participation of stakeholders in toll road programmes. The participation of stakeholders (particularly the public at project sites) in matters relating to toll road infrastructure rollout is clearly stipulated in Sections 17, 59, 70, 72, 115 and 118 of the Constitution of the Republic of South Africa Act, No. 108 of 1996. These set the tone for public participation, legislative processes in particular, along with related provisions, and the aim of these sections are to ensure that governments remain accountable, transparent and open. (Luke & Heyns, 2013:1). In promoting this form of participation, the 2030 stakeholder pillar encourages SANRAL to:

- implement a stakeholder engagement strategy and plan;
- strengthen media relations;

- ensure effective marketing and advertising;
- promote joint planning and project delivery co-ordination;
- create effective internal communication platforms;
- ensure improved interaction with social media users;
- generate content and use own media; and
- extend research to better understand and respond to customer needs (SANRAL, 2020:17(a)).

By engaging with its stakeholders (particularly the public) and allowing them to participate in the decision-making process regarding matters related to toll roads, SANRAL is averting or minimising the level of conflict which can lead to a temporary or a total shutdown of a toll road due to public protest or the pull-out of investment by investors. The usage of traditional or social media could assist SANRAL in communicating its message to the relevant stakeholders.

3.5.2.1 *SANRAL Stakeholder Relations and Social Facilitation Strategy 2020/21-2022/23*

The Stakeholder Relations and Social Facilitation Strategy attempts to integrate social facilitation tactics to strengthen and realise the 2030 stakeholder pillar focus areas and is born out of the SANRAL Strategy Horizon 2030 (SANRAL, 2020:3(b)). The following criteria has been used to determine if an organisation will be included as a stakeholder for the period of 2020/2021 – 2024/2025.

- i. Is the organisation directly or indirectly affected by SANRAL's operations or mandate?
- ii. Does the entity hold a position from which they can influence the work of SANRAL?
- iii. Does the organisation have the capability to influence resources (personnel, funding)?
- iv. Does the entity or organisation have any specific skills or network that SANRAL can leverage in the implementation of its annual performance plan (APP) (SANRAL, 2020:7(b))?
- v.

The criteria above provide the guidelines to be used to assist SANRAL to identify possible or potential stakeholders. However, the criteria are short on details for the guidelines to be followed when identifying the public as stakeholders. These criteria are solely focused on private organisations that have some form of influence on SANRAL's work, understating the influence of the public.

3.6 ENVIRONMENTAL LEGISLATIONS ON TOLL ROADS INFRASTRUCTURE

Development issues must be tackled in a manner that ensures environmental sustainability and builds resilience, particularly in poorer communities, to the effects of climate change (NDP, 2012:197). This statement talks to the manner in which SANRAL and concessionaires should behave regarding environmental issues when developing and constructing toll road infrastructure. The applicable environmental legislations are discussed below.

3.6.1 National Environment Management Act, No. 107 of 1998

Szabo (1999:11) points out that reliable environmental impact assessments must be performed if a road improvement project is to be successfully implemented. The government (the National Treasury, DoT and SANRAL) and the private sector (concessionaires) have to tie the toll road infrastructure rollout programme to the environmental impact in order to realise the country's developmental objectives. In order to minimise the negative environmental impacts of a toll road infrastructure rollout programme, Section 24(a)(b)(i)(ii)(iii) of the Constitution of the Republic of South Africa Act, No. 108 of 1996, led to the development of the National Environment Management Act, No. 107 of 1998. To interpret this Act, one must read it together with the Acts below.

3.6.1.1 National Environment Management: Air Quality Act, No. 39 of 2004

Rees (2016:16) alludes that air pollution may be man-made or naturally occurring in the environment, and Choudhary and Garg, (2013:1) further state that air pollution is the introduction of chemicals, particulates or biological materials into the atmosphere that cause human discomfort, disease or death, affect other living organisms such as food crops, or harm the natural environment or the built environment. The rollout of road infrastructure and vehicle traffic have a direct negative impact on air quality.

Based on this, the South African government intervenes by means of the Air Quality Act, No. 39 of 2004. This Act intends:

“To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto”.

In relation to toll road infrastructure, the above statement encourages SANRAL and concessionaires to strike a balance between the prevention of air pollution and economic and social development, since roads are drivers for economic development, however, at the same time, contribute to air pollution through emissions. To make sure that SANRAL and concessionaires strike a balance between the prevention of air pollution and economic and social development, Section 30 of this Act states that an air quality officer may require any person to submit to an atmospheric impact report in a prescribed form if:

- a) the air quality officer reasonably suspects that the person has on one or more occasions contravened or failed to comply with this Act or any conditions of a licence, and that such contravention or failure has had, or may have, a detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage, or has contributed to the degradation of ambient air quality;
- b) a review of a provisional atmospheric emission licence, or an atmospheric or emission licence, is undertaken in terms of Section 45.

Along the toll roads, the cultural heritage sites, ecological conditions and the health of citizens are negatively impacted by the poor air quality, hence SANRAL and concessionaires must ensure their compliance with atmospheric, emission or provisional atmospheric emission licences in order to minimise the impact of poor air quality.

3.6.1.2 National Environmental Management: National Water Act, No. 36 of 1998

Water is one of the renewable resources required for the maintenance of all life forms, food production, economic growth and general well-being (Singh & Gupta, 2014:1). However, water pollution poses a significant threat to humans and the marine environment while marked population growth catalyses climate change (Palmate, Pandey, Kumar, Pandey & Mishra, 2017). This Act was primarily developed to mitigate water pollution, and according to the National Water Act, No. 36 of 1998:

“The purpose of this Act is to ensure that the nation’s water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors: - meeting the basic human needs of present and future generations, promoting equitable access to water, redressing the results of the past racial and gender discrimination, facilitating social and economic development, etc.”

In the context of this study, the above statement refers to the protection of water resources against any activities that might contaminate the nation’s water and deprive the current and future generations of the potable water. To protect water resources from pollution as a result of road infrastructure activities, Section 19(1) of this Act, states that an owner of land, a person in control of land or a person who occupies or uses the land on which—

- a) any activity or process is or was performed or undertaken; or
- b) any other situation exists, which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.

However, without the introduction of monitoring and assessment systems, the measures mentioned above are not sufficient for the protection of water resources which can be affected by road infrastructure activities. Section 137(1) states that the Minister of Water and Sanitation must establish national monitoring systems for water resources as soon as reasonably practicable, and in Subsection (2), further alludes that the systems must provide for the collection of the appropriate data and information necessary to assess, among other matters:

- a) the quantity of water in the various water resources;
- b) the quality of water resources;
- c) the use of water resources;
- d) the rehabilitation of water resources;
- e) the compliance with water resources quality objectives;
- f) the health of aquatic systems; and
- g) the atmospheric condition which may influence water resources.

Suffice to say that the establishment of national monitoring systems for water resources assists in ensuring that the rehabilitation of water resources is honoured by SANRAL and concessionaires. This system also binds SANRAL and concessionaires to preserve the health of aquatic systems and reduce the level of atmospheric pollution which may influence water resources. In terms of road infrastructure activities, the national monitoring systems should enforce compliance to the water resources quality objectives in order to prevent water pollution. According to Singh et al. (2014:2), there are two sources of water pollution, namely:

- Point source of pollution are those that have a direct recognisable source, i.e. pipe connected to a factory, oil spill from a tanker, waste from industries; and
- Non-point sources of pollution are those that originate from various sources and the number of ways in which pollutants enter the groundwater or surface water come from various non-identifiable sources in the environment, i.e. runoff from agricultural fields, urban waste, etc.

From the above, the researcher deduced that two sources of water pollution should prompt SANRAL and concessionaires to implement monitoring systems and other measures in order to minimise the contamination of the country's water resources.

3.6.1.3 National Environmental Management: Biodiversity Act, No. 10 of 2004

Biodiversity is a comprehensive umbrella term for the variety of nature found within the natural environment, both in number and in frequency (Rawat & Agarwal, 2015:19). This variety within the natural system is constantly threatened by human activities (such as infrastructure rollout) and other factors. By definition, a biodiversity threat refers to any process or occurrence that is likely to cause adverse effects on the status or sustainable use of any portion of biological diversity, whether natural or

human induced (Mutia, 2009:3). In mitigating the threats posed by the rollout of infrastructure and other natural factors to biodiversity, the National Environmental Management: Biodiversity Act, No. 10 of 2004, intends:

“To provide for the management and conservation of South Africa’s biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith”.

In relation to toll road infrastructure activities, this Act ensures the tenable usage of indigenous biological resources and the protection of ecosystems and species. Section 49(1) of this Act alludes that the Minister of Environmental Affairs must, for the purposes of this chapter, designate monitoring mechanisms and set indicators to determine:

- a) the conservation status of various components of South Africa’s biodiversity;
and
- b) any negative and positive trends affecting the conservation status of the various components.

SANRAL and concessionaires should abide by the monitoring mechanisms above and set indicators to protect the conservation status of various components of South Africa’s biodiversity. The three major levels of biodiversity are as follows:

- Genetic diversity: this involves genetic variation within species, both among geographically separated populations and between individuals within a single population;
- Species diversity: this applies to the spectrum of species on earth, from acellular viruses to single-celled microorganisms such as bacteria, actinomycetes, mycoplasmas, etc.; and

- Ecosystem diversity: this relates to changes in biological populations in which the species live, the environment in which the communities live, and interactions between these levels (Singh, 2010:8-9).

Due to their fragility, the three levels of biodiversity must be treated with care by SANRAL and concessionaires while performing toll road infrastructure activities. By treating environmental diversity with care, SANRAL and concessionaires will be acting within the parameters of the National Environmental Management: Biodiversity Act, No. 10 of 2004.

3.6.1.4 National Environmental Management: Protected Areas Act, No. 57 of 2003

Protected areas serve as benchmarks against which human interactions with the natural environment are understood (Özyavuz, 2012:3). It is therefore necessary to strike a balance between human activity and nature by using protected areas as a tool. Protected areas are one of the most effective ways of conserving biodiversity (Possingham, Wilson, Andelman & Vynne, 2006:07). Environmentally protected areas are the cornerstones of nearly all national and international conservation techniques, set aside to preserve functioning natural habitats, to serve as refuges for biodiversity and to maintain ecological processes that cannot thrive in heavily controlled landscapes and seascapes (Özyavuz, 2012:3). In ensuring the protection of these areas, the National Environmental Management: Protected Areas Act, No. 57 of 2003, intends:

“To provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; and for matters in connection therewith.”

Despite the bold statement above, the protected areas of South Africa continue to face challenges such as inadequate conservation planning, non-cooperative governance, exclusionary conservation strategy, resource limitations, management conundrums

and contradictory declaration and protection procedures (Paterson, 2009:6-10). However, the introduction of this Act brought significant strides in overcoming these challenges, and SANRAL and concessionaires are restricted from operating in the protected areas unless they satisfy Section 41(3) of this Act, which emphasises that the management plan must include:

- a) development of economic opportunities within and adjacent to the protected area in terms of the integrated development plan framework.

The construction of roads within and adjacent the protected areas can only happen if they contribute to the economic growth of the area. However, in doing so, SANRAL and concessionaires must subject themselves to Section 43(3) in which the management authority of a protected area must:

- a) monitor the area against the indicators set in terms of Subsection (1) or (2); and
- b) annually report its findings to the Minister or MEC, or a person designated by the Minister or MEC.

In terms of the co-management of the protected areas, Section 42(1)(a) states that the management authority may enter into an agreement with another organ of state, a local community, an individual or other party for:

- a) the co-management of the area by the parties; or
- b) the regulation of human activities that affect the environment in the area.

For the purposes of co-management of the protected areas, SANRAL and concessionaires are bound by the abovementioned section to enter into an agreement with the management authority before the construction of any road can take place.

3.6.2 Spatial Planning and Land Use Management, No. 16 of 2013

Historic inequalities, including skewed spatial planning, were the order of the day in South Africa. Spatial planning was meant to fulfil the purpose of racial segregation in South Africa before 1994 (Mponwana & Mphethi, 2017:2), and Schoeman (2015:44) alludes that with the democratisation of South Africa in 1994, the democratic government inherited a segregated and fractured spatial structure which was led by

an equally ineffective policy and legislative framework. In addressing this challenge, the Spatial Planning and Land Use Management, No. 16 of 2013 (SPLUMA) plans:

“To provide a framework for spatial planning and land use management in the republic; to specify the relationship between the spatial planning and the land use management system and other kinds of planning; to provide for the inclusive, developmental, equitable and efficient spatial planning at the different spheres of government; to provide a framework for the monitoring, co-ordination and review of the spatial planning and land use management system.”

The SPLUMA is the national legislation for all South African spatial planning (Mponwana & Mphethi, 2017:2). Therefore, SANRAL and concessionaires have to comply with the SPLUMA before any road can be constructed. Under the purpose and content of the land use scheme, Section 25(1) of this Act gives effect to, and be consistent with, the municipal spatial development framework in order to promote:

- a) economic growth;
- b) social inclusion;
- c) efficient land development; and
- d) minimal impact on public health, environment and natural resources.

SANRAL and concessionaires should ensure that the construction of the toll roads contributes to the local economic development of the municipality and allow local communities to take part in road construction programmes. Again, SANRAL and concessionaires must adhere to high road construction standards in order to ensure the efficient usage of land and ensure that no harm is inflicted on the environment, public health and natural resources. In ensuring that all the spatial planning and land use management requirements are met, Section 9(1) instructs the Minister of Land Affairs to:

- a) monitor:
 - i. compliance with the development principals, norms and standards;
 - ii. progress made by municipalities with the adoption or amendment of land use schemes;

- iii. the quality and effectiveness of municipal spatial development frameworks and other spatial planning and land use management tools and instruments; and
- iv. the capacity of provinces and municipalities to implement this Act.

SANRAL and concessionaires must work hand-in-glove with the provinces and municipalities to implement its functions according to this Act. By doing so, SANRAL and concessionaires will satisfy all of the monitoring requirements. The spatial structuring implications are outlined below (North-West Provincial Spatial Development Framework, 2016).

- **Intervention Zone One:** Main economic growth areas for prioritised spending on development.
- **Intervention Zone Two:** Social inclusion areas that reflect investment priorities in people rather than in places.
- **Intervention Zone Three:** Enhancing and implementing new potential growth nodes (NPGN).
- **Intervention Zone Four:** Environmentally sensitive Zone.

The Provincial Spatial Development Framework outlined above is developed from the Spatial Planning and Land Use Management Act in order to address the spatial planning challenges in the North-West Province.

3.7 CHAPTER SUMMARY

This chapter highlighted the significance of various legislations, policies and strategies during the infrastructure development of toll road concessions in SA. What was highlighted is that the construction and development of toll roads should be done within the constraints of legislation that governs the environment. Ramifications occurring due to deviations towards these environmental legislations were featured.

In this chapter, the relevancy of developmental service delivery and socio-economic policies for the toll road concessions in SA were explained. The importance of basic infrastructure delivery to the citizens was stressed based on the Constitution of the Republic of South Africa, No. 108 of 1996. Thorough discussions on the National Treasury PPP Practice Note Number 01 to 10 of 2004, and the SANRAL and National

Roads Act, No. 7 of 1998, were made in order to describe the partnerships between SANRAL and the concessionaires. The next chapter analyses the PPP models used for the toll road concessions.

CHAPTER 4

ANALYSIS OF PPPS' MODELS ON TOLL ROAD CONCESSIONS

4.1 INTRODUCTION

In the previous chapter, the statutory and regulatory framework governing PPPs in South Africa were discussed in detail. In this chapter, the PPP models for toll road concessions are analysed. The PPPs are placed somewhere between privatisation and the public sector's traditional or conventional procurement methods. The PPP models are conduits or tools used to configure the PPP arrangements according to the shareholders, lenders, government, concessionaires, users and subcontractors' best interests. This is typically achieved by relinquishing specific ownership of a public infrastructure asset in order to build a revenue source that the private sector can use to recoup its expenditure and capital invested (Miller, 2014:3). As a result of this arrangement, road users benefit from a well-maintained road infrastructure.

4.2 SUMMARY OF EXISTING CHALLENGES IN PPP MODELS

When the government is driving the infrastructure rollout on its own, without the help of the private sector, the projects often tend to be prolonged since the government is a sole source of project financing. Furthermore, project costs tend to escalate to the advantage of consultants and businesses and the private sector does not transfer its skills to the government which in turn disadvantages the government skills base. In the cases where PPP models are adopted, there is an exchange of skills, the government is relieved of the responsibility for funding the project alone, the maintenance of road infrastructure is outsourced and the level of project efficiency increases due to creativity and innovation. However, the challenges associated with PPP models are as follows:

- a) Many PPP models are complicated and confusing;
- b) Both partners display opportunistic tendencies in one way or another;
- c) Private businesses refuse to engage in tenders because of an inability to establish an appropriate business plan, and state constraints and reservations about moving all risks to the private sector;

- d) Due to the asymmetry of the information available to public and private partners, there is a discrepancy in the application of financial interests for public and private partners; and
- e) The fear of a private partner's bankruptcy and full liability for the project obstructs the finalisation of a partnership agreement at the initial stage (Anopchenko, Gorbaneva, Lazareva, Murzin & Ougolnitsky, 2019:9).

The PPP models are complex by their nature, and to some extent, they contribute to a tussle (opportunistic behaviour) between public and private partners. Essentially, some PPP models inhibit the participation of the private sector in infrastructure projects due to the transferring of all risks to the private partner and the restrictions involved. Potential private partners are less enthusiastic to sign PPP contractual agreements due to the possible failure to conclude the project based on the stipulations contained in the PPP contracts. Therefore, the features and characteristics of PPP models have the power to determine the success and duration of the project. In support hereof, Wolmer (2002) concludes that contracts for PPP models can either be short-term or long-term, and the variations to these models are identified as follows:

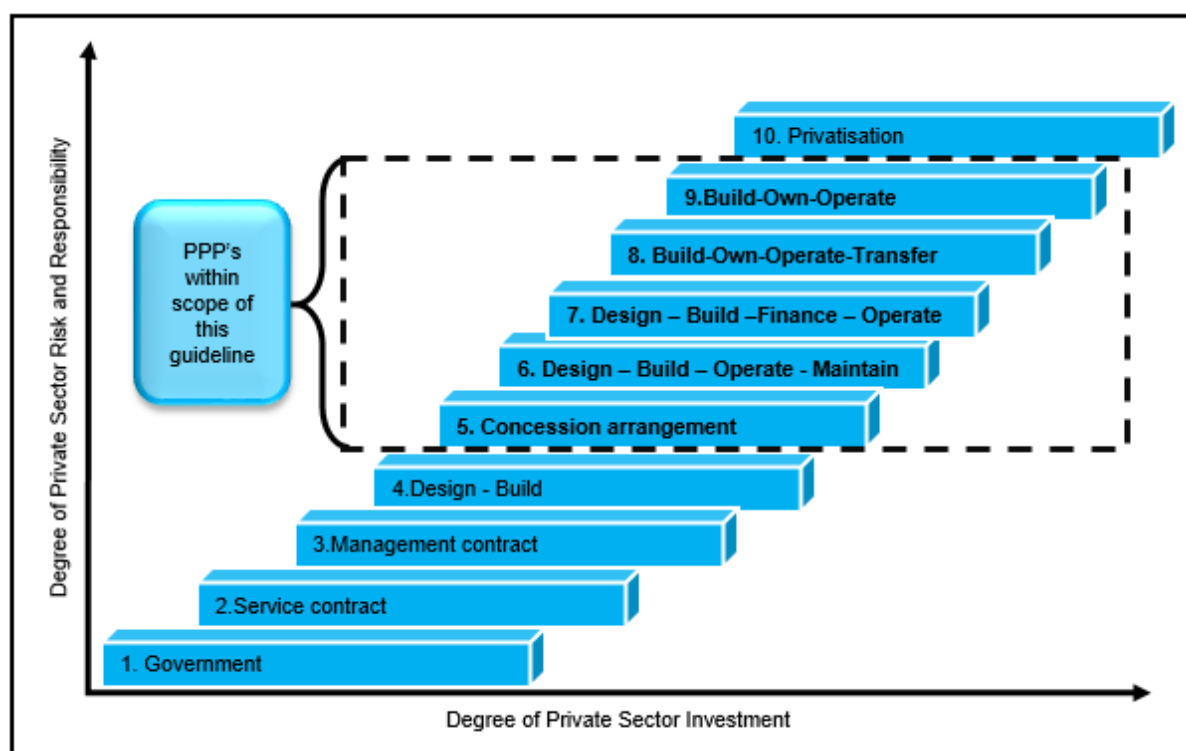
- a) Period of the contract;
- b) Ownership of capital assets;
- c) Allocation of risks and responsibilities; and
- d) Return on investment (ROI) value (Wolmer, 2002).

Various PPP models operate differently based on which partner owns or is in possession of more assets since this affects the duration of the PPP contract. The other factor that affects the PPPs contract duration is how both partners are allocated risks. Preferably, the partner with more capacity should be allocated more risk, and in instances where this principle is not followed, the chances of a PPP project collapsing increase. Lastly, if there is no return on investment, potential private partners will find the PPP project unattractive. The next section focuses on the PPP models.

4.3 DISCUSSIONS ON PPP MODELS

Akbiyikli and Eaton (2003:506) allude that the advent of public-private sector initiatives for procuring infrastructure facilities using models such as the build, operate and transfer (BOT); build, own, operate and transfer (BOOT); design, build, finance and

operate (DBFO) and the build, own and operate (BOO) models gives governments alternative means to meet the needs and demands for infrastructure. These models assist governments to rollout infrastructure projects, however, to a certain degree, these models place the risk exposure onto the concessionaires.



Source: Accounting Standards Board (2008:15)

Figure 4.1: Hierarchy of a Private Party's Risk Exposure and Responsibility versus Involvement in a PPP Model

Figure 4.1 illustrates the level of exposure that the private sector faces in terms of risk and responsibility versus their involvement in a PPP model. This level of exposure should serve as a reminder to the public sector that a private partner involved in a PPP arrangement should be given the opportunity to make a return on investment. Discussions on a slew of PPP models follow:

4.3.1 Design, Built, Finance, Operate (DBFO) Model

Bojović (2006:299) asserts that the DBFO model is synonymous with public-private partnerships because it is ideally suited to complex projects and offers the greatest benefits. Under this model, the private entity is responsible for the construction of new roads or other forms of infrastructure, maintenance of historic roads and the entire financing and execution of the long-term lease of the project (Interreg Central Europe,

2017:46; Shaoul, Stafford & Stapleton, 2006:3). The private partner is contracted to build or upgrade the road under the government's specifications, and long-term leasing is implemented to achieve this. Under this model, in the context of the UK, the 30-year lease term was chosen due to the payment model having to accommodate debt financing, which typically has a maturity span of 20 years, to be repaid and to ensure that equity investors earn a return (Shaoul et al., 2006:3). The DBFO model is in Table 4.1.

Table 4.1: Public-Private Partnership Type: DBFO Model

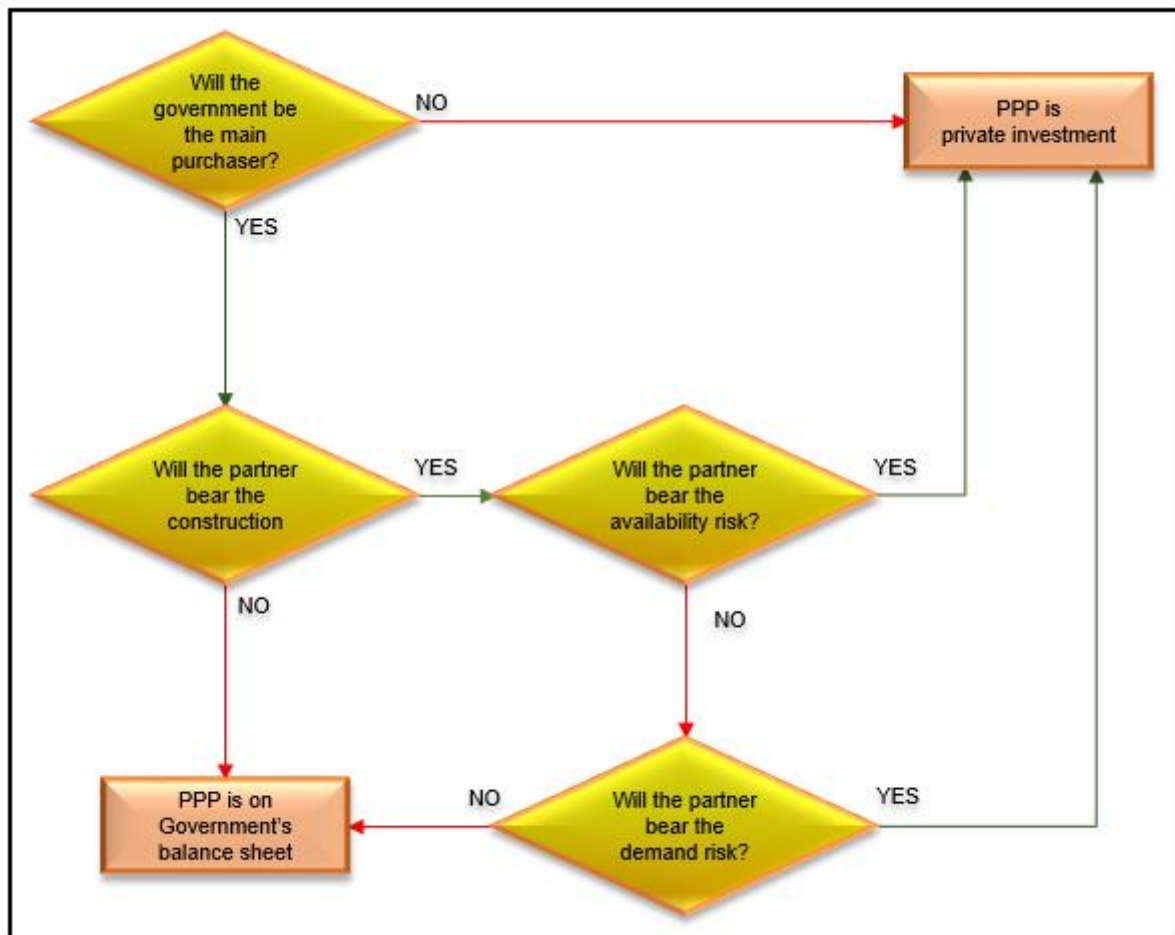
DBFO Model	
Features: • The public sector contracts a private entity to design, build, finance and operate a facility for a given duration, after which the facility returns to the public sector; • The facility is owned by the private sector for the contract duration and recovers costs through public subvention; • The use of private financing and the transfer of construction, design and operational risk are main drivers; and • Different variations contain various combinations of principal roles and responsibilities.	Application: • Suitable for projects containing substantial operating content; and • Suitable for toll road concessions, waste and water projects in particular.

DBFO Model	
Strength: • Lures finance from the private sector; • Encourages discipline in debt financing; • Encourages fiscal management and discipline; • Delivers a more stable and predictable cost profile; • Greater possibility for quicker and rapid execution of projects; and • Increased risk transfer to the private entity and offers greater motivation for private parties to adopt a life-long costing approach to design.	Weaknesses: • Potential contradiction between environmental and planning considerations; • Contracts are more complicated, and negotiations require significant durations; • The tendering process requires much more time than the BOT model; • Requires performance monitoring system and contract management; • Funding or finance assurances may be required; • A change management system is needed; and • Cost of re-entering the project if operator fails to meet the contractual expectations of the project.

Source: Civildaily.com (2017:Online)

Table 4.1 shows that the disadvantage of the DBFO model is that, in terms of procurement, this model takes longer to conclude compared to the BOT model. The DBFO model is distinguishable from most other models. The use of private finance, as well as the transfer of design, development and operational risk to the private sector, are all major drivers of the DBFO model (Bojović, 2006:305). Another distinction of the DBFO model is that it typically combines disparate responsibilities such as design, construction and maintenance under a single operator to articulate collaboration, contracting and risk-sharing, and that the assets are held by the government (Herrala & Pakkala, 2009:30). This idea of giving one single company the responsibility for design, construction and maintenance is vital to the project cost. A holistic approach under which a single organisation assumes obligation for the build, operation and maintenance results in reduced costs because previously there was inadequate incentive for the different parties to work together to optimise the VFM of the project, particularly in relation to the long-term costs (Shaoul et al., 2006:3). However, the downside of this model is that it takes longer to conclude due to its

complexity and financial guarantees are required before any serious negotiations can take place. In particular, the construction phase may be delayed due to the intricacies of the tendering process. Furthermore, environmental issues versus planning may compound the delay.



Source: Van der Geest and Nunez-Ferrer (2011)

Figure 4.2: Budget Decision Tree on DBFO Contracts

According to Figure 4.2, the private partner finances the project, however, the figure questions whether the private partner should bear the responsibility of availability and demand risks alone, and whether the government should be the purchaser in this PPP model. In allaying some of the concerns raised above, the host government should provide partial credit guarantee and this ensures that the investment brought by the private investor is protected. Again, the private sector ensures that its investment will be safe throughout the lease period by engaging into a negotiation process to finalise the project details before the implementation phase. In order to reimburse the private

partner for financing the project, two government payment mechanisms exist in DBFO-based road projects, and they are:

- **Shadow toll payment mechanism:** the public sector pays the concessionaire based on the amount of traffic volume and the demand risk should be transferred to the private entity; and
- **Availability payment mechanism:** the concessionaire is responsible for keeping the road open to the public and the public sector bears the demand risk (Acerete, Gasca & Stafford, 2018:3).

These payment mechanisms attempt to mitigate some of the complex questions posed in Figure 4.2. In the first payment mechanism the demand risk is shifted to the private partner since this entity is compensated based upon the traffic volume by road users. At the heart of this mechanism is the protection of the government's interests. Whereas, the second payment mechanism assures and protects the interests of the private partner since the risk factor lies with the public partner, and that the private partner should maintain the road and recoup its investment through toll fees during the lease period.

4.3.2 Built, Operate and Transfer (BOT) Model

According to Mgalla (2015:4), the BOT model is more appropriate for a project involving operating content. Operating content involves the content management and strategy of the project, and both should clearly outline the details of a build and operate approach. In the BOT model, a private company or concessionaire retains a concession from a public entity known as the principal (client) for the construction and operation of a public facility for a set duration (Bashiri, Ebrahimi, Fazlali, Hosseini, Jamal & Salehvand, 2011:2). According to Gbadegesin and Oyewole (2014:811); Al-Azemi, Bhamra, and Salman (2014:418) and Lekan, Opeyemi and Olayinka (2013:240), the concessionaire is responsible for the design, finance, construction and operation of the facility for a fixed duration. As a consequence of the BOT model, the private sector builds the infrastructure, operates the infrastructure for a fixed period, and then transfers the infrastructure back to the state at the end of concession period. However, in the BOT model, the private contractor may or may-not provide some or

all of the financing for the project (Mashwama, Thwala, Tserema & Aigbavboa, 2018:373). A further analysis of this model is discussed in Table 4.2.

Table 4.2: Public-Private Partnership Type: BOT Model

BOT Model	
Features: - Contractual agreement with a private entity to design, build and operate a public facility for a given duration, after which the facility is reverted to the government; and - The transfer of operating risk is the major driver, additionally to finance, design and construct.	Application: - Suitable for projects containing substantial operating content; and - Recommended for projects pertaining to water, toll roads and waste.
Strength: - The risk for design, finance, construction and operation are transferred to private partner; - Potential to expedite the completion of a project; - Promotes innovation in the private sector and enhances value for money; - Enhanced quality for operation and maintenance; - Allows the government to concentrate on core public sector obligations; - Risk transfer offers incentive to a whole-life costing approach; and - Contracts should be comprehensive and holistic.	Weaknesses: - Contracts are complicated and procurement can take long to conclude but lesser time than that of the DBFO model; - Requires systems for performance monitoring and contract management; - Cost of re-entering the project if operator fails to meet the contractual expectations of the project; and - Potential contradiction between environmental and planning considerations.

Source: Civilsdaily.com (2017:Online); Durdyev and Ismail (2017:197)

Table 4.2 shows that the BOT model encourages innovation by private partners, which in turn showcases the VFM aspect and expedites the project completion. Another critical factor in the BOT model is that the finance, operating, construction and design risks are transferred to the private partner and this reduces the risk element of the public partner in the project. In this model, a special purpose vehicle (SPV) is established to generate revenue during the concession period for investment recovery and debt repayment (Zang, 2005:1055). Again, this special purpose vehicle cushions

toll road concessionaires, government, shareholders, etc., against the impact of defaulting. Furthermore, the process of investment recovery and debt repayment compels the government to agree to a lengthy concession period with concessionaires in order to provide the concessionaires with enough time to service the debt.

Based on the Table 4.2, the researcher deduced that the BOT model attempts to strike a balance between environmental issues and planning, which is sometimes difficult to achieve and puts the government at odds with environmental groups. This model compels the government agency (SANRAL) to monitor the performance of the private entities (concessionaires) activities related to the design, construction and operation of the concession. Under the BOT model, the government prepares a project brief as part of the tender documents to:

- explain the general requirements of the government with regards to the project and concessions and to provide appropriate information;
- offer guidance in the preparation of tenders and clarify the criteria for tender evaluation; and
- set out the government's specifications for design, construction, operation and maintenance in detail (Akintoye, Beck & Hardcastle, 2003:275).

From the above information, in the context of SA, and in the experience of the researcher, the BOT tender document contains information on the scope of work, pricing data and the returnable documents required, which include a notarised joint venture agreement, proof of registration to the National Treasury (NT) central supplier database, proof of appropriate CIDB grading designation, a copy of the CIPC documents, tax clearance certificate, B-BBEE certificate, etc. Furthermore, the tender document contains functionality criteria for grades, such as the project experience of the firm, client references, the locality, a schedule of plant and equipment resources, the CVs and qualifications of key personnel.

4.3.3 Improve, Finance, Maintain, Operate and Transfer (IFMOT) Model

Existing projects are often more difficult to finish than new projects because more details are required (Mgalla, 2015:5). In remedying this, the IFMOT model becomes useful. The IFMOT model is developed solely to tackle the challenges faced by

existing infrastructure projects. Some of the features of the IFMOT model are stated below:

- **Improve:** in aspects such as quality, management and facilities, the private sector would have to enhance the state of the existing project;
- **Finance:** to finance the existing infrastructure project;
- **Maintaining:** during the concession period agreed upon by all stakeholders, the private sector is responsible for the maintenance and monitoring of the project; and
- **Operate:** the contractor will provide the project's users with regular services as needed (Mgalla, 2015:7).

According to the above, the IFMOT model advocates for the inclusion of the private partner to lend support by providing capital to the already existing PPP project for the purpose of improving the existing infrastructure. This model, like the DBFO model, transfers the responsibility for the maintenance and operation of the infrastructure to the private partner during the concession. The DBFO and IFMOT models share the following characteristics:

- After the lease term has expired, ownership is transferred to the government;
- The private sector is responsible for financing, maintaining, and operating the facility during the concession period;
- Both models allow the government to either partially or entirely finance the project depending on the current economic situation;
- The government has access to the innovation, creativity, management and equipment of the private sector; and
- The public and private sector embark on a long-term contractual agreement ranging from 25 to 30 years (Mgalla, 2015:7).

The similarities discussed above indicate how close the DBFO model is related to the IFMOT model. The main difference between these two models is that the IFMOT model is suitable for the on-going or existing infrastructure project whereas the DBFO model is more suited for greenfield (new) infrastructure projects. In contrast to the

DBFO, the IFMOT model faces more risk as ongoing projects are associated with additional risks (Mgalla, 2015:7).

4.3.4 Build, Own, Operate and Transfer (BOOT) Model

Russell-Weisz (2014:6) alludes that the BOOT model and the DBFO model are similar. Just like in the IFMOT model, the DBFO has similarities with the BOOT model. The BOOT model is a founding model and a form of concession in which a public authority makes an agreement with a private entity (concessionaire) to design, build, own and operate a particular infrastructure project with the purpose of generating revenue from the facility for a period of time and then transfer it back to public ownership through a single organisation or consortium (Arndt, 2000).

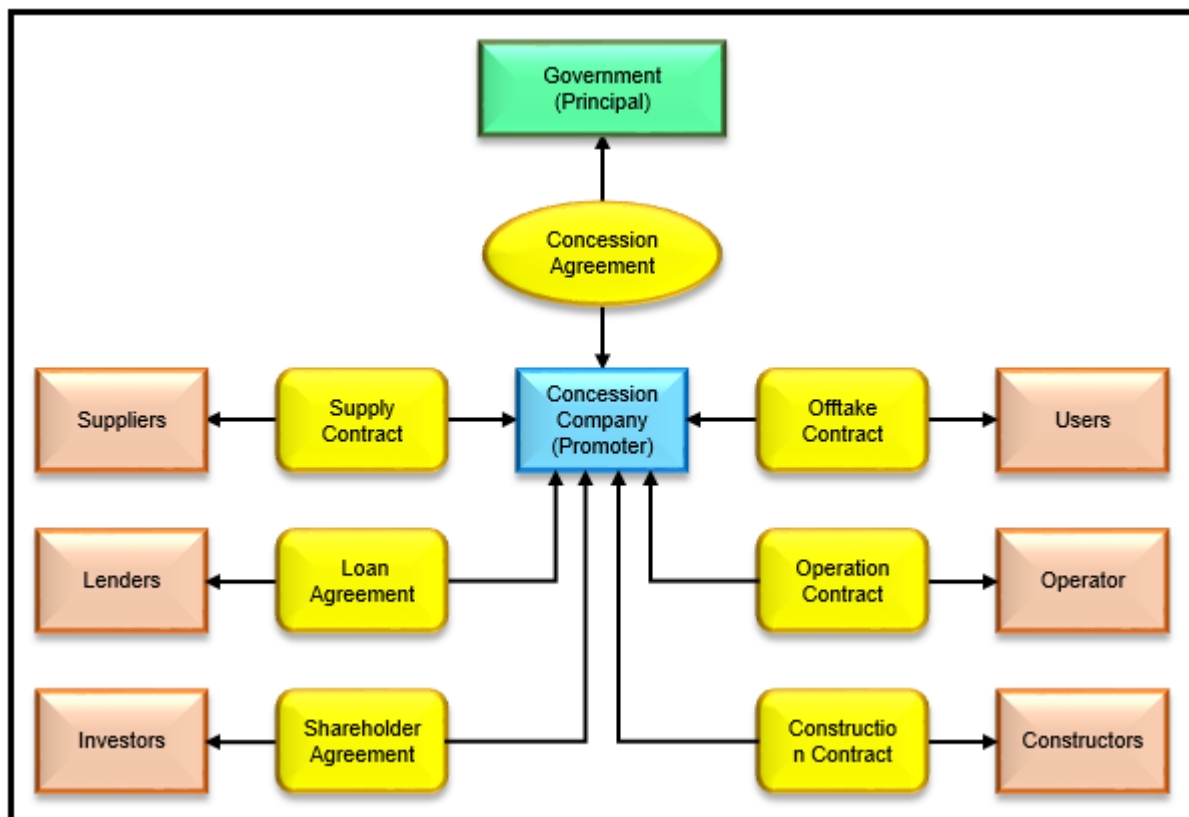
Table 4.3: Public-Private Partnership Type: BOOT Model

BOOT Model	
Feature • A private entity erects the facility; • A private entity operates the facility under a concession; and • The facility is transferred to the government at the completion of the concession period.	Risk Transfer • The private entity inherits the commercial and equity risks; and • The private entity inherits the construction risks.
Access to Private Finance • Substantial capital infusion for construction, maintenance and operation.	Comment • Particularly applicable if the government has a wide gap in infrastructure financing; • Suitable for projects requiring substantial investment or operating content; and • Viable choice for the majority of projects.

Source: PPIAF (2009:64)

The public-private partnership BOOT model highlighted in Table 4.3 indicates that the private partner provides the capital for the project and assumes all construction risks. However, in return, the private partner expects to increase its investment. Furthermore, the private partner assumes the responsibility for building , owning and

operating the facility. At the end of the concession period, the private partner hands the facility over to the government.



Source: McCarthy and Tiong, 1991

Figure 4.3: A Typical Structure of a BOOT Project

Figure 4.3 illustrates the exposure the concessionaire is faced with under the BOOT model. The concession agreement between the government and concessionaire offloads or exonerates the government from much of the risk associated with PPP projects. According to the concession agreement above, the private company must directly and solely deal with the suppliers, lenders, investors, users, operators and construction companies. Under this agreement, the concessionaire is expected to enter into loan, supply shareholder, offtake, construction and operational agreements and contracts.

4.3.5 Build, Own and Operate (BOO) Model

The BOOT and BOO concession models have several similarities, however, under the BOO concession agreement, ownership of the asset does not revert back to the government after the concession period ends (Akbiyikli et al., 2003:510). As a result,

the toll road is officially given to the concessionaire at the end of the concession period, unlike in the BOOT model. This model differs from the BOOT model in that a project is designed, financed, constructed and operated by the promoting team with the goal of syndicating all, or part, of the equity after completion (Bakhteyari, 2007:7). This approach of aggregating design, finances, construction and operation of infrastructure services into one contract is a critical element of the BOO model.

Table 4.4: Public-Private Partnership Type: BOO Model

BOO Model	
Feature - Ownership of the facility is not transferred back to the public partner at the end of the concession period; - The facility is built by the private entity; and - The facility is operated by the private entity on a concession.	Risk Transfer - The private entity takes over equity and other commercial risks; and - The private entity takes over construction risks.
Access to Private Finance Significant injection of working and construction capital for maintenance and operation.	Comment - Appropriate for projects that involve operating content or substantial investment; - If a demand history exists, then market risk may be relatively low; and

Source: PPIAF (2009:64)

According to Table 4.4, in a BOO model the private company is allocated commercial and construction risks which can inhibit the smooth and successful completion of the concession period due to the possibility that the concessionaire might fall into bankruptcy if these two risks are not properly managed. In comparison to the traditional procurement model where the design, financing, construction and operation are handled separately, the BOO model minimises cost overruns due to its integrated approach to these project phases. Minimising the cost overruns in a BOO model is critical because the success of the concessionaire depends on cost controlling measures which have an impact on the concessionaire's revenue.

4.3.6 Design, Build, Operate and Maintain (DBOM) Model

This type of a PPP combines a design and build model with the transfer of operations and maintenance (O&M) responsibilities to a private sector partner but does not involve private financing (Design-Build Institute of America Publication, 2016:2). Therefore, the public sector secures the project's financing independently and retains the operating revenue risk. The requirements of a DBOM model are as follows:

- A 'full service' PPP that does not require private sector capital finance;
- All services are designed, built, maintained and operated by the private sector for a fixed duration;
- The requisite capped capital funding is provided by the public sector; and
- The public sector specifies and defines the required services to be provided or delivered (scope and quality) which are purchased at a set price or rate as agreed upon (Russell-Weisz, 2014:7).

From the aforementioned information, the specification, scope and quality of PPP is determined by the government agency since the government is the single source of capital finance and the private partner only focuses on designing, building, operating and maintaining.

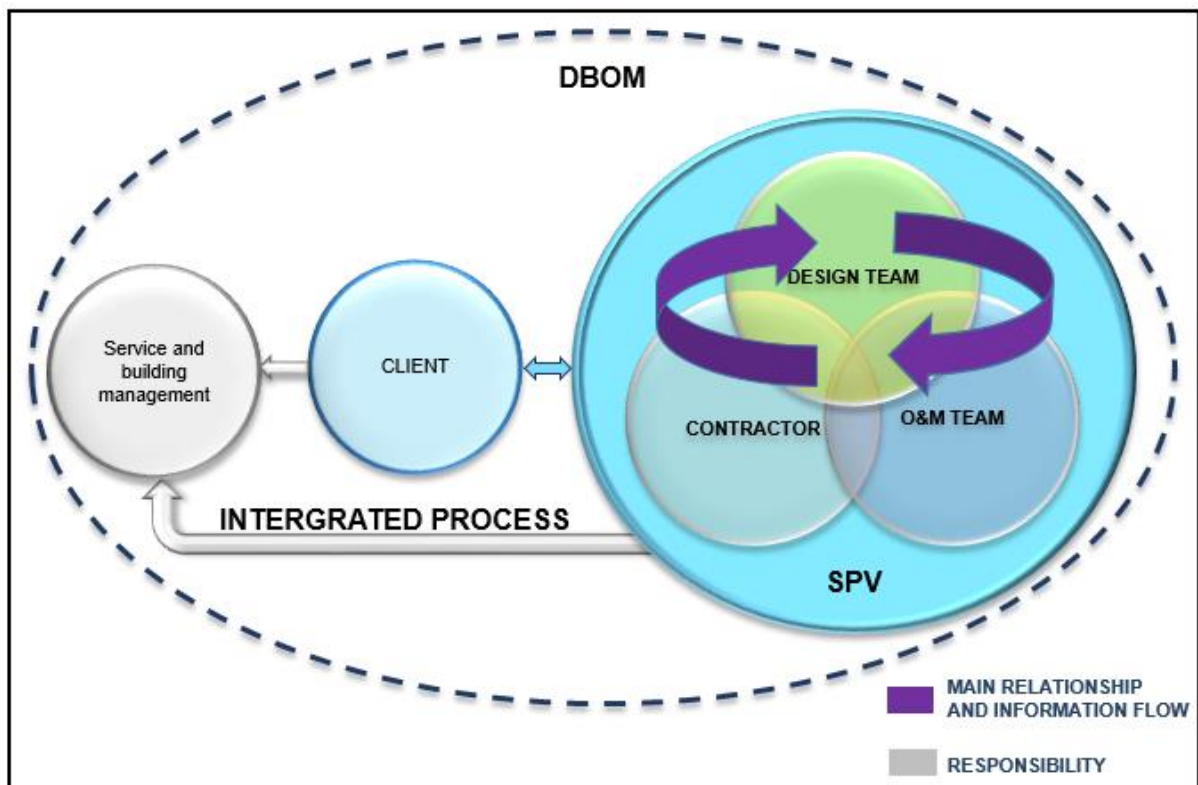
Table 4.5: Project-Level Issues of the DBOM Model

BOO Model	
<u>Project Size/Complexity:</u> • Advantages - The DBOM model is ideal for large projects; and - Similar to the DB model because of the single source of accountability, the DBOM model can promote better management of big projects. • Disadvantages - Due to the overhead cost, the DBOM model is not ideal for smaller projects (e.g. maintenance, etc.); and - Similar to the DB model, the DBOM model can demand large peaks in the prerequisites for owner staffing.	<u>Cost:</u> • Advantages - The fixed cost to design, build, operate and maintain is provided to the owner early in the process. • Disadvantages - Due to the large amount of risk being transferred to the provider, costs may be higher if providers are not afforded opportunities to establish efficiencies; and - The DBOM model pricing may be difficult to negotiate due to the intricacy and time frame of maintenance agreements.

BOO Model	
<u>Schedule:</u> • Advantages - Offers a single point of accountability (the contractor) for controlling schedules; - Offers early scheduled certainty; - Traditionally, offers the least schedule growth; - Offers opportunities for adaptability in schedule compression; - Facilitates the start-up process because of a single accountability point for the design, build and operation; and - Is traditionally faster than a DBB model or a CMR model. • Disadvantages -The concessionaire will squander the advantage of having completed the design on time prior to the start of construction; and - A rapid schedule will necessitate the concessionaire's effort in design and building reviews.	<u>Risk Allocation:</u> • Advantages - Offers a single-party risk allocation for designing, building, operating and maintaining; and - The risk of design errors, omissions in building, operations and maintenance are owned by contractors. • Disadvantages - Risks are distributed through conceptual design and requires for efficient designing, building, operating and maintaining.

Source: The National Academy of Sciences (2009)

Based on Table 4.5, the researcher gathered that the advantage of the DBOM model is that it combines the responsibility for the design, build and maintenance under the function of a single entity. This model enables the private partners to take advantage of a fixed cost for the designing, building and maintaining at the initial phases of the PPP project. The project design can be tailored to the construction equipment and materials that will be used. In addition, the DBOM team is required to establish a long-term maintenance program up front together with estimates of the associated costs. The team's detailed knowledge of the project design and materials utilisation allows it to develop a tailored maintenance plan that anticipates and addresses needs as they occur, thereby reducing the risk that the concessionaire is exposed to. However, DBOM-based projects are larger by nature, and due to this, some technical issues will go undetected and unattended, leading to deterioration and even more costly problems.



Source: Nical and Wodynski (2015:350)

Figure 4.4: DBOM as an integrated process

Figure 4.4 confirms the notion that the designing, building, operating and maintaining phases of a DBOM model are integrated under a single contractor since this enables a better flow of information and there is better clarity in terms of responsibilities. The improved information flow and clarity of responsibilities will familiarise the public and private partners with their individual roles in this PPP arrangement.

4.3.7 Design, Build, Finance and Maintain (DBFM) Model

The private partner in a design, build, finance and maintain (DBFM) model must design, construct and finance the project as well as maintain it for several years after its completion (Favié, Beelen & Maas, 2009:1). In this model, the concessionaire is expected to start the project from the design phase and continue to maintain it until the end of the contract when it is returned to the government. Table 4.6 provides a description of a DBFM model.

Table 4.6: Advantages and Disadvantages of DBFM Contracts

DBFM Contracts	
Advantages of Design and Build	Disadvantages of Design and Build
• The client is not responsible for the design and build interface. Complications in these interfaces usually have a detrimental effect on the cost, schedule and quality; • Parallel planning of a significant part of the design period together with the construction period are feasible and controllable within the same entity; • No loss of time for the transition from design to construction (no different contracts, and no different parties); • The design increases the quality of construction due to the input of construction knowledge, and this model also has a safety advantage; • Maximum attention on installation costs during the design phase, and the private entity has more flexibility to design, and is therefore able to incorporate optimisations; • Strong incentive exists to deal openly with any technical issues during the design stage, and prevent any 'hidden costs' resulting from vague or omitted details; and • The construction planning informs hard deadlines.	• A private entity can calculate too much contingency for complicated projects with major uncertain risks; • Design and build projects demand a functional specification of the scope (or else the advantage of the design freedom diminishes, and the risk for small technical changes revert back to the client); • The duration is usually long and unpredictable for preliminary design and trace determination. It is often not simple to fit this in a lump sum contract; • With a lump sum design and build contract, the tendency exists to save on architectural details; • The use of the government's design expertise is difficult when the private partner is responsible for design; and • In a design and build contract, the client has minimal control, power and influence on the design. Later, when the customer assumes the control, power and influence over the design, they must be prepared to take responsibility for the design.

DBFM Contracts	
Advantages of Private Financing	Disadvantage of Private Financing
• Through the payment of interest on the private loans, the well-known principle of 'time equals money' is now introduced into infrastructure work. This focus permeates to all the partners, including the client; • Identification of risk: in the private sector lenders are more focused on risk; • Realistic budgets: private sector companies, by their nature, are less exposed to political and strategic budgeting. This reduced exposure avoids budgets being intentionally set too low due to political and strategic reasons; • Enables projects to start sooner since it is not necessary to await the client's budget availability because the project becomes relatively independent from the client's budget planning; • The disturbances and changes are less: contractual amendments on funding and time complications have less negative impact on the acceptance of amendments; • Additional checks and balances: the client is bound to do checks, and the investors are also bound to do their own checks; • More clarity: promotes accountability and transparency in general; • Reduced bureaucracy: government departments are encouraged to demand less additional authorisation or permits; • Greater transparency and reliability in the government finances with long-term budgets; and • Potential choices for toll road systems can be merged successfully.	• Higher financing costs: typically, private parties have far higher funding costs than the government (based on public opinion); • It is necessary to keep a small portion of the project finance structure with the government. This will assist the government to keep control over the money; • State budget problems: a short-term budget challenge for the state occurs when expenditure must be allocated for a project that was not planned or scheduled for many years; • Expensive bidding process: the process of bidding is relatively expensive. Since competition must be guaranteed, this procedure must be followed with multiple competitors; and • When many adjustments in the construction scope are forecast, a 'fixed price contract' is typically not the best option. The slow pace at which maintenance adjustments are made is normally not too complex.

DBFM Contracts	
Advantages Maintenance	Disadvantages Maintenance
• The 'total life cycle cost' approach is highly recommended; and • This long-term obligation "automatically" prevents the private entity from moving too rapidly and neglecting efficiency and quality in its pursuit to save time.	• There is still a lack of familiarity with (functional) maintenance specifications in contracts; • At this time, the government is best prepared to manage the maintenance task. Contracting small parts to a private entity is more expensive; and • Additional private maintenance features necessitate good working relationships with government maintenance agencies.

Source: Roohé (2007:4-6)

According to Table 4.6, the researcher deduced that the concessionaire is able to have a higher amount of influence over the design, although consultations with the government is required at all times in order to accommodate these inputs. However, the challenge regarding the design is on integrating or merging the ideas of the private partner with those of the public partner. External factors such as political influence on the budget are minimal in this model because the private partner is in charge of the budget. However, unplanned changes can increase the budget expenditure to the detriment of the PPP project. Even though the government can maintain infrastructure for a relatively low cost, the private entity is more suited for infrastructure maintenance because they can better handle the total life cycle cost of the project. In most cases, the probability for delay increases if the government is the one responsible for the infrastructure's maintenance, and time, budget and efficiency are of essence in a infrastructure project, hence the adoption of this model. The PPP models used in the toll road concessions in SA are discussed in the next section.

4.3.8 Design, Construct, Finance, Operate and Maintain (DCFOM) Model

Under the DCFOM model, the private partner is liable for the design, construction, finance, operation and maintenance of the facility, and in addition, the private partner provides the project finance by securing private funds (Martin, 2018:3; Mashwama et al., 2018:373; International Bank for Reconstruction and Development (IBRD), 2017:41). As a result, the government is not exposed to the risk associated with all five phases mentioned above. Therefore, in the DCFOM model, the risk and any

associated expenses are entirely borne by the private entity (Prieto, 2012:3). The most critical thing from the government is the provision of the facility to the private entity. The private partner gets compensated over the life of the project from the money generated from the constructed facility while the constructed asset is held by the government (Mashwama et al., 2018:373). In the context of toll road concessions, the revenue is generated through toll fees, and this payment method depends solely on traffic volumes which could be under or over-estimated. In respect to the DCFOM model, the contract usually entails provisions to assist the private partner if the revenues are lower than predicted, such as right-of-way provisions, development subsidies or limited revenue guarantees (Molenaar, Harper & Yugar-Arias, 2014:58).

Table 4.7: Public-Private Partnership Type: DCFOM Model

Parameter	DCFOM
Strategic Business Objectives	Politically, technically and economically driven.
Top Level Key Performance Indicators (KPIs)	Cash flow; return on investment availability or other performance payment indicators.
Strategy	Focused on outcomes.
Government Commitment	Front-end loaded.
Procurement Process	• Procurement is transparent; • Selection is competitive; • There is a competition of ideas; and • Financing and lifecycle cost competition.
Stakeholder Management	Roles are significant in a DCFOM model
Project Selection	• Life cycle decision framework; • A preferred option may be advocated by the private sector; and • Project selection is rigorous.

Parameter	DCFOM
Project Management	• Focus of the owner is on partnering with the DCFOM contractor only; • Construction process and parallel design; • Prior to the start of construction, procurement may commence (early design elements); and • The DCFOM contractor is responsible for execution
Scope	• Functional performance specification completeness is a requirement; • Functional specification ensures that “needs” are met and the cost of “wants” are not incurred; and • Limited design influence beyond what is specified in the functional specification.
Schedule	• Design process is driven by schedule; and • Schedule performance is incentivised.
Budget	There is certainty for the life cycle cost.
Risk Focus	Life cycle
Risk Reserves	Event and quantitative risks
Risk Management	Disputes are resisted to a single contractor
Integration Risk	The integration risk is passed to the contractor.
Interface Risks	The interface risk is passed to the Contractor
Errors and Omissions (E&O) Risk	Owner has no Errors and Omissions exposure

Source: Prieto (2012:4-6)

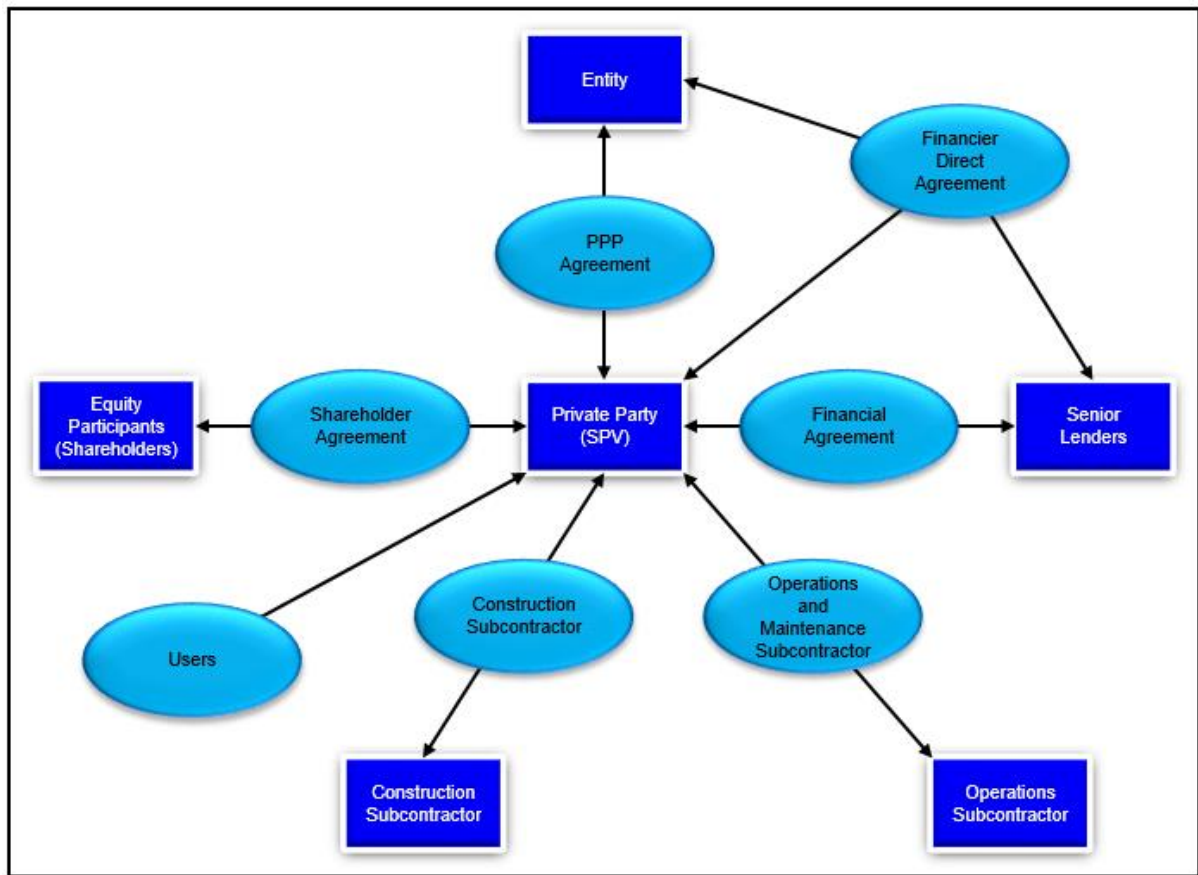
According to Table 4.7, in the DCFOM model, the government, as represented by its agency, enters into a single concession contract with one concessionaire per concession period, and the concessionaire, through a special purpose vehicle (SPV), creates debt in order to finance the facility. All DCFOM-based projects are financed in part or entirely by debt which is secured by the private partner (IBRD, 2017:41).

Again, from Table 4.7, it can be deduced that the private partner should be incentivised for satisfactory performance. With a long-term DCFOM contract, the concessionaire has reason to spend more on construction upfront if there will be a return in the form of reduced maintenance costs during the project's lifetime (United States Department of Transport, 2017:2).

In this regard, the DCFOM model allows for the concurrent or parallel running of design and construction and the procurement precedes the construction phase. The procurement process is open and transparent to avert corruption and disputes. In instances where there are disputes, the government engages with that particular concessionaire to resolve any disputes but does not engage with the concessionaires as a group.

4.4 PPP MODELS IN THE CONTEXT OF TOLL ROAD CONCESSIONS IN SOUTH AFRICA

Around 19% of the national road network is made up of toll roads, the majority of which are maintained by SANRAL, while the remainder are developed, operated and maintained by private corporations (Matshidze, Oyegoke & Ogunlana, 2016:420). According to the National Treasury (see par. 1.1), the toll road concessions investigated for this study have adopted the DFBOT model. However, according to SANRAL and the concessionaires (see par. 6.3.2.3.2 and par. 6.3.2.3.3), the PPP model adopted for their concessions is the DCFOM model, as was established by the participant interviews for this study. Therefore, the DCFOM model arrangements vary widely, especially in terms of how much financial and technical responsibility is transferred from the public sector to the private sector (IBRD, 2017:41). These variations in the DCFOM models for the toll road concessions in SA have an impact on the SPV and are discussed below.



Source: Accounting Standards Board (2008:12)

Figure 4.5: PPP Agreements Where a SPV is Established

Figure 4.5 shows that in South Africa a private-sector consortium usually forms a special company known as an SPV to construct, finance, maintain and operate the assets for the duration of the contract (Witters, Maron & Steinert, 2012:81). An SPV is a separate corporation established solely for the purpose of serving as the contractor for a long-term PPP project (Martin, Lawther, Hodge & Greve, 2013). In particular to the toll road concessions in SA, the SPV is legitimised by the PPP agreement to get involved in negotiations with shareholders and senior lenders and to take decisions on matters relating to shareholders and financial agreements. It is also given the power to consult with road users and subcontractors. As a result, it is critical for researchers and practitioners in the South African construction industry to comprehend the theoretical context from which to derive either an ideal or optimum PPP approach (Chege & Rwelamila, 2001:7).

4.5 CHAPTER SUMMARY

This chapter discussed various models with respect to their strengths, weaknesses, advantages and disadvantages. The discussions also focussed on the appropriateness of these models towards the PPP projects regarding infrastructure development. From these discussions it was deduced that factors such as the size, funding, duration and risk of the project informs the selection of a PPP model and that the relationship between the public and private partners is critical for the realisation of a comprehensive PPP. However, this relationship relies heavily on the performance of both partners, particularly the private partner, and performance is determined from monitoring. The next chapter focuses on research methodology and design, of which a thorough description of the data collection methods, research instruments, procedures, themes, sampling and research design for this study is provided.

CHAPTER 5

RESEARCH METHODOLOGY AND DESIGN

5.1 INTRODUCTION

Chapter 4 discussed the PPP models for toll road concessions that were analysed as part of this research study. This chapter will discuss the research methodology used to collect data for this study, as well as the instruments used by the researcher to help understand the different elements related to PPPs in the road sector. This research study generates new information, ideas and values to add to the current body of knowledge. However, for research to generate new information, ideas and values, a strict protocol must be developed and followed. Therefore, this study strictly followed a research methodology protocol that consisted of data collection techniques, the research approach, sampling and ethical considerations, and these concepts are discussed in detail below.

5.2 RESEARCH METHODOLOGY

Research methodology is necessary in the sense that it encourages the researcher to apply a methodologic, systematic and logical approach to finding solutions to the research problem. According to Ugwuowo (2016:5), the research methodology leads and guides the research and the manner in which it is carried out. Therefore, it provides the principles for planning, organising, designing and administering the research (Mohajan, 2017:1). These principles enabled this research to adopt a systemic, procedural, logical and methodological approach. The advantages of a research methodology are as follows:

- Advancement of a human beings;
- Provides the required resources for conducting the research;
- Fosters a critical and analytical attitude, as well as disciplined observational thinking;
- Enhancement of the research process and the opportunity for in-depth study and comprehension of the subject;
- Assists in the development of the ability to evaluate and apply research findings with reasonable trust and confidence in decision-making; and

- Instils the ability and capacity to read and think critically (Ugwuowo, 2016:5).

Due to these advantages mentioned, this study was able to apply critical thinking and judgement with regard to the interpretation of research results. The research methodology determines the type of data collection technique from which the research results emanate (Rajasekar, Philominathan & Chinnathambi, 2013:6). All the necessary tools and resources required for undertaking this research study were decided during the outlining or unpacking of research methodology. The acquiring of new knowledge enabled the understanding of the subject being studied. Furthermore, the research methodology for this study analysed and described the methods.

5.3 QUALITATIVE RESEARCH METHOD

Qualitative research method employs a naturalistic approach to better understand phenomena in particular contexts, such as 'real-world settings', in which the researcher does not try to influence the phenomenon of interest (Patton, 2002:39). In conducting this type of research method, the researcher is required to socially interact with participants in their setting in order to comprehend the realities of the phenomenon. Qualitative research focuses on the understanding, explanation and nature of the phenomenon (Ryan, Coughlan & Cronin, 2009:309; Stewart, Gill, Chadwick & Treasure, 2008). Palmer and Bolderston (2006:16) further state that to research human experiences and realities from the perspective of the subject, qualitative methods utilise descriptions and categories (words). The words which form part of the conversation (interviews) with the participants distinguishes qualitative research methods from quantitative research methods. Qualitative data yields findings that are not reached by statistical techniques and procedures (such as frequency) or other quantification methods (Strauss & Corbin, 1990:11).

This study recognises that the environment in which the participants are subjected to, is dynamic in its nature. Johnson and Christensen (2012:32-36) found that the social environment is flexible and not static in the eyes of qualitative researchers. Furthermore, it is a method of research that generates a concise description of the participants' thoughts, feelings, beliefs, experiences and perceptions, as well as interpreting the meanings of their actions (Denzin & Lincoln, 2011). However, the qualitative research method has its weaknesses. The qualitative research method is

widely criticised for lacking scientific rigor, with insufficient justification of the methods used, a lack of transparency in the analytical procedures, and the findings being nothing more than a collection of subjective opinions susceptible to researcher bias (Rolfe, 2006; Sandelowski, 1993). Below are several characteristics of the qualitative research method.

- It is non-numerical, descriptive, reasoning-based and word-based;
- It aims to understand, feel, describe and explain the situation;
- Data that is qualitative cannot be graphed;
- It is exploratory in nature; and
- It enquires into the why and how of decision making (Rajasekar et al., 2013:9)

Since this research study adopted the qualitative research method, words were used in the form of interviews to collect data and this assisted in answering the research questions. The researcher probed the participants to determine their true feelings and opinions about the subject under discussion since this enabled the researcher to explore new information about the title of this research. Furthermore, the researcher packaged the information gathered into themes. The research design is discussed in the next section.

5.4 RESEARCH DESIGN

The procedures for gathering, reporting, interpreting and analysing data in research studies are known as research designs (Creswell & Plano Clark 2007:58). Mouton (2001:56) describes the research design as a blueprint or model design of a research project, as well as the implementation of the design and the research methodology as the construction process using methods and tools. Therefore, this research study was guided by procedures regulating the collection, interpretation, reporting and analysis of data to achieve professionalism and the gathering of far-reaching information. Research design is important because it allows for the different research procedures to run smoothly, resulting in research that is as professional as possible, yielding more information with the least amount of time, money and effort (Akhtar, 2016:71). In short, the research design must at least include:

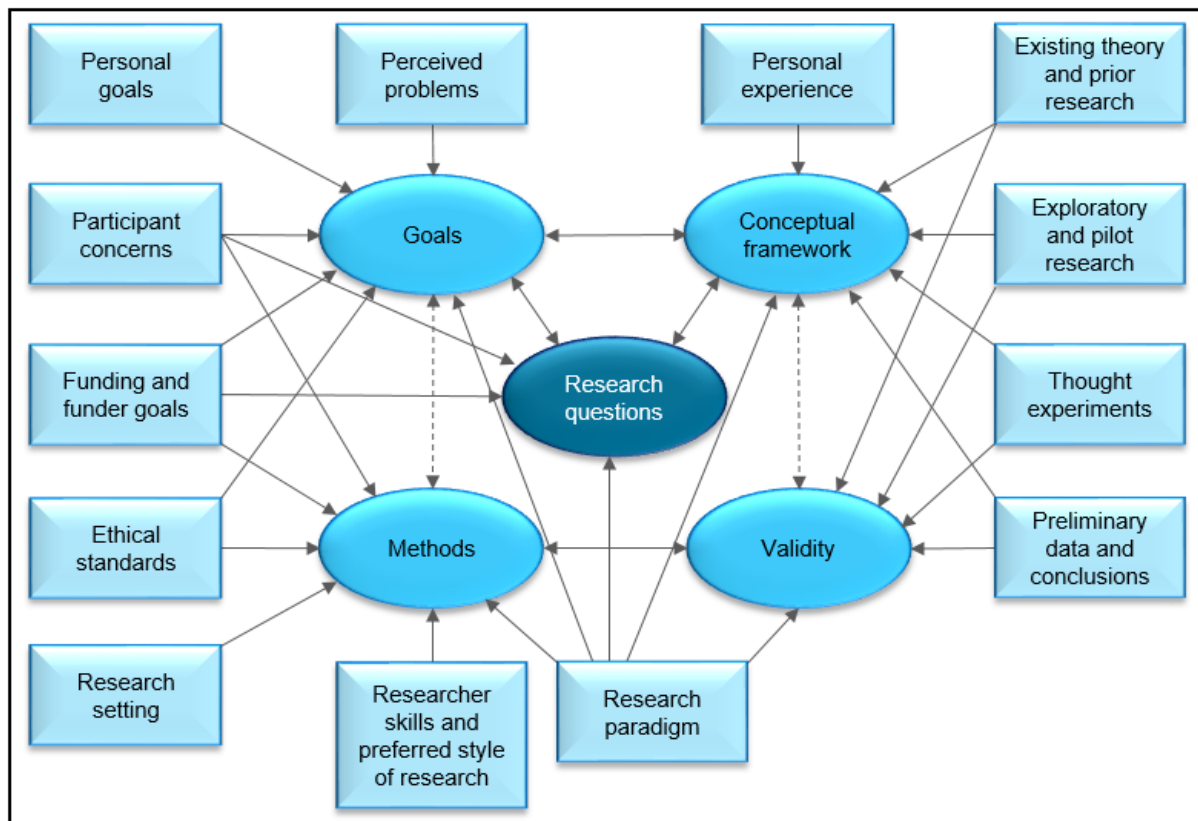
- a concise statement of the research problem;

- techniques and procedures to be utilised for collecting information or data;
- the population that will be studied; and
- The methods to be used in data analysis and processing (Kothari, 2010).

According to the above, a good research design is described by adjectives like concise, efficient, flexible, economical and appropriate (Akhtar, 2016:72). Therefore, this research study should be versatile, reasonable and clear in order to satisfy these characteristics. The three methods for **exploratory research studies** in the context of research design are:

- **the survey of concerning literature** which is the simplest and most fruitful method for precisely formulating the research problem or developing a hypothesis;
- **the experience survey** of participants who have had practical experience with the problem being investigated; and
- **the analysis of 'insight-stimulating' examples** is a better method to suggest a research hypothesis. It is particularly appropriate in areas where there is not much experience to serve as a guide (Kothari, 2004:36).

In accordance with the above, this research study included participants with vast experience of the problem being investigated, and where there was a lack of experience, an analysis of insight-stimulating examples was used to serve as a guide. Figure 5.1 illustrates the contextual factors influencing a research design.



Source: Maxwell (2008:218)

Figure 5.1: Contextual Factors Influencing a Research Design

At the core of the model shown in Figure 5.1 are five research design components (goals, conceptual framework, validity and methods) interacting and integrating with each other. However, other considerations that affect the design of the research in addition to these five include the availability of resources, your skills to conduct the research, the research environment, ethical standards, perceived challenges and the preliminary conclusions and data of the study (Maxwell, 2008:217-218). Figure 5.1 shows that research design:

- forms the base for structuring a qualitative research proposal that clearly communicates and justifies the major design decisions;
- emphasises the interactive nature of qualitative and applied research design decisions, as well as the numerous connections between design components; and
- precisely specifies the key issues on which decisions must be taken about design components (Maxwell, 2005).

Despite the above, conducting this type of research study is risky because it is difficult to know whether something new can come from it.

5.4.1 Exploratory Research Design

Where there are none or few previous studies to refer to in order to predict an outcome, an exploratory design method is used to investigate the research problem. As a result, conducting this type of research is, by definition, risky, since it is impossible to predict whether or not anything novel will emerge from the process (Swedberg, 2018:2). Exploratory design seeks to illustrate and investigate an un-interpreted or unexplored phenomenon to gain a deeper understanding of that problem (Marshall & Rossman, 2006:262; Cavana, Delahaye & Sekaran, 2001). This research study had no intention to test the hypotheses. Since hypotheses cannot be proven, an exploratory research design should not seek to test them (Popper, 2002). Instead, an exploratory research design asks how much, how well, or how meaningful and fruitful of an explanation a theory or hypothesis can provide (Reiter, 2017:144). Table 5.1 shows the features of exploratory design.

Table 5.1: Exploratory Design Features

Exploratory	
Objective:	To impart knowledge and understanding.
Characteristics:	The information required is only loosely defined; The research process is unstructured and flexible; The sample size is restricted and small; and Primary data analysis is qualitative in nature.
Findings/ Results:	Tentative
Outcome:	Generally followed by further conclusive or exploratory research.

Source: Singh (2014:322)

From the Table 5.1, it can be deduced that an exploratory design aims to provide previously overlooked explanations by actively involving the researcher in the process of amplifying his or her conceptual tools, allowing him or her to pose new questions and provide new explanations of a given reality from a new perspective (Reiter, 2017:144). Based on the above statement, this research study sought to create new

assumptions and ideas through the processing of the newly acquired knowledge. The creation of new assumptions and ideas would be achieved by analysing the primary data of a small sample by following a flexible and unstructured process. The following section discusses a qualitative research approach in detail.

5.5 A QUALITATIVE RESEARCH STRATEGY

Phenomenology was deemed the appropriate research strategy due to the circumstances surrounding this research study.

5.5.1 Phenomenology

The main strategies of qualitative research are grounded theory, phenomenology, ontology, epistemology, logic and ethnography. This research study opted for a phenomenology approach. According to Husserl (1970), the phenomenology approach aims to describe rather than explain, and to begin from a point of view that is free of hypotheses or preconceptions. Creswell (2006:57) further states that a phenomenological approach explains the meaning for multiple individuals based on their lived experiences of a phenomenon or concept. Unlike in narrative study, the phenomenology approach does not focus solely on a single individual's experiences but rather on several individuals' experiences. It is also explained by Giorgi and Giorgi (2003:23-24) that a consensus and univocal phenomenological interpretation is difficult to achieve. For this reason, each phenomenologist seems to have their own distinct style of phenomenology (Qutoshi, 2018:217).

This study relied heavily on the experiences and responses of the participants. Phenomenological approaches are especially successful at gathering individual experiences and beliefs from the point of view of the respondents and thereby questioning normative or structural assumptions (Lester, 1999:1). These experiences and beliefs of the respondents are interpreted. Adding an interpretive dimension to phenomenological research allows it to guide, support or question policies and actions by allowing it to be used as the foundation for practical theory (Qutoshi, 2018:215; Lester, 1999:1).

Table 5.2: Phenomenology Approach

Tradition	Overview	Applications	Interview considerations
Phenomenology	Phenomenology is a field or branch of philosophy that seeks to examine (and understand) participants' lived experiences. The goal is to create an image of the issue or phenomenon for people other than the participants.	To explore and investigate the experiences of executives in the toll road concessions.	Reflective interviews that are long and semi-structured .

Source: Bolderston (2012:67)

In accordance with Table 5.2, Marshall and Rossman (2010); Kyale and Brinkman (2009) allude that in a phenomenological interview, a semi-structured approach is ideal. The semi-structured interviews assisted this study by providing the complete and lived experiences of the participants. The phenomenological approach describes human experiences and meanings in a rich, fresh, complex, complete and comprehensive description (Finlay, 2009:7). This enables the researcher to not impose any findings since the findings will emerge on their own.

5.6 DATA COLLECTION METHODS/INSTRUMENTS

Two data collection methods or instruments, namely document review and interviews, were chosen for this study.

5.6.1 Document Review

A myriad of documents assist with highly sought-after information in research. Minutes from meetings, departmental policies, publications from national and regional associations and newspaper articles are all sources of primary documents that a researcher might analyse, review and examine for data (Palmer et al., 2006:17). The accessibility of the documents in question is the first thing a researcher must ensure. This may be a significant problem if those documents are deemed confidential (Bell, 1999). In the case of this research study, confidential information was set aside to avoid litigation.

5.6.2 Interviews

Interviewing people is one of the most common and widely used methods of collecting information about something. This study used interviews as the data collection method. Open-ended (particularly semi-structured) questions were used for this study and the data was gathered through interviews (Hsieh et al., 2005:1279). In a qualitative research design, interviews are the backbone of primary data collection (Adhabi & Anozie, 2017:87), and as a result, interviews are often used in qualitative research as a data collection method (Ryan et al., 2009:309). Therefore, an interview is considered a form of conversation between two or more individuals with the intent to extract, collect or gather the relevant information on a particular topic relating to a phenomenon. A 'good' qualitative interview, according to Dörnyei (2007:140), has two main characteristics:

- it flows naturally; and
- it is rich with detail.

The interviews provided this research study with densely-packed information since they were rich in detail. However, the interviews had the following sources of interview errors.

- **Deviation from the written instructions in a structured interview:** for example, not using show cards with pre-coded answers, reading out pre-coded answers that were not to be read out, adjusting the wording of the questions, not following the proper order of questions, not following the correct filters on the question routing;
- **Interrogation error:** this happens when questions are phrased differently for each respondent, such as asking, "What is your age?" could elicit a different response than simply asking, "How old are you?" Some respondents can give a younger age if the word "old" is used;
- **Interpretation error:** this is when the interviewer makes a personal judgment on how to code a response. This can happen when the possible responses are pre-coded and the interviewer needs to allocate the respondent's answer into an established box; and

- **Recording error:** it is widely accepted that the more details an interviewer must write down, the more likely he or she is to make a mistake in recording the data. There is a tendency to shorten responses, and not always in an accurate manner (Mathers, Fox & Hunn, 1998:8).

5.6.2.1 *Advantages and Disadvantage of Interviews*

Kvale (1983:174) alludes that the purpose of an interview is to collect descriptions of the participant's lifeworld in order to interpret the essence of the described phenomena. Despite the significant contribution to this research study, the use of interviews had both advantages and disadvantages, as discussed below:

Table 5.3: Advantages and Disadvantages of Interviewing

Advantages	Disadvantages
return rate was high	consumed more time
fewer unanswered questions	only suitable for a small-scale research study
involved real-life situations	anonymity cannot be guaranteed
answering order was highly controlled	possibility of subconscious bias
comparatively flexible	inconsistencies were possible

Source: Brown (2001)

According to Table 5.3, one advantage of interviews (non-numerical data) is to study and detail the nature and quality of how the participants understand, experience and behave (Alshenqeeti, 2014:39). The downside of an interview is that it requires more time and is small-scale in nature. Interviews, on the other hand, are more effective at eliciting narrative data than questionnaires, allowing researchers to dig deeper into the participants' opinions and views (Kvale, 1996:2003). Another shortcoming of an interview is that anonymity cannot be assured. On the positive side, the return rate is much higher than that of a questionnaire.

5.6.3 Type of Interview Used in this Study

There are three types of interviews, namely structured, semi-structured and unstructured. A semi-structured interview was used for the purpose of this research study.

5.6.3.1 *Semi-Structured Interview*

Structured interviews allow the interviewer (who wields a great deal of power) to have complete control over the interviewee, limiting the interviewee's ability to be informal and flexible (Stuckey, 2013). Unlike the structured interview, the researcher will interject as needed during a semi-structured interview (open-ended questions) to ensure that the participant understands the topic or question under investigation (Adhabi et al., 2017:91). Bell (2009) adds that the agenda is fairly set in a semi-structured interview, but the interviewer is free to follow the respondent's train of thought and delve into any tangential areas that might arise. However, there are hindrances and weaknesses to the usage of semi-structured interviews. Analysing interview data from semi-structured questions is more difficult than analysing data from structured questions since more work must be performed before the participants' diverse responses can be compared (Fox, 2009:6). This work takes a significant amount of time, and the researcher in this research study spent substantial time to compare the participants' diverse responses.

When gathering attitudinal data on a wide scale, or when conducting exploratory research and a list of potential pre-codes is not possible due to little knowledge about the subject area, semi-structured interviews are useful (Mathers et al., 1998:2-3). Because of the complexities surrounding the collection of data, which are based upon the attitudes of the participants, it is hard to achieve uniformity. Fox (2009:6) supports this by stating that it is difficult to establish uniformity among participants when semi-structured questions are used. Irrespective of this difficulty, the semi-structured interview can produce rich data that provides a more in-depth understanding of a subject matter than a questionnaire (Bell, 1999). One of the reasons for selecting the semi-structured interview for this research study was for the richness of data and for in-depth understanding of a subject matter.

5.6.4 The Interview Technique Used in this Study

There are several types of interviews, such as telephone interviews and face-to-face interviews. Face-to-face interviews were used for this study.

5.6.4.1 Face-to-Face Interviews

Face-to-face interviews can benefit from social cues such as the interviewee's accent, intonation, voice and body language, which can provide the interviewer with a wealth of additional knowledge that can be applied to the interviewee's verbal response to a question (Opdenakker, 2006:3). The interviewees' accents, intonations, voices and body language contributed immensely to this study because the researcher was able to probe and clarify questions. In face-to-face interviews, synchronous time communication means that both the interviewer and the interviewee will respond to what the other says right away (Opdenakker, 2006:5). It should also be noted that these interviews for this study were conducted by means of online calls using Zoom. The population for this research study is described in the section to follow.

5.7 POPULATION

A population is the aggregate of all the individuals chosen for their unique characteristics and who are of interest to a researcher (Moffatt, 2015:53). The researcher in this study selected the population according to their wealth of knowledge, experience and expertise on toll road infrastructure. Executives from the state-owned enterprise, government departments, concessionaires and lobby groups were all selected and interviewed.

The process of interviewing these executives improved with time but was repetitive and iterative. One or more information sources were sampled from this population as part of an iterative, repetitive and improved process that involved data collection, analysis and interpretation (van Rijnsoeve, 2017:4). The following section outlines the sampling used for this study.

5.8 SAMPLING

The size of the population, its homogeneity, the sample media, its cost of use and the level of precision desired, all influence sample selection (Salant & Dillman, 1994:54). All of these aspects impact the decision to choose a sample, which in the case of this

research study, contributed immensely to the sample selection. A sample is a subset of the population and is considered as a smaller group of elements chosen from a specific population using a stringent and well-defined procedure (Moffatt, 2015:53). Therefore, a sample as a subset of the population does not have to be large. With good planning and a smaller sample size, credible, reliable and accurate results can be obtained (Delice, 2010:2013). The smaller sample size and good planning assisted this research study in terms of budget and time. Sampling is a practical, effective and reliable alternative that enables research projects to be completed on time and on budget (Ragab & Arisha, 2018:6). The six steps of the sampling design process are generally provided as follows:

- Describe and define the population;
- Establish and determine a sampling frame;
- Choose a sampling technique;
- Determine and decide the sample size;
- Data collection; and
- Assess and evaluate the response rate (Taherdoost, 2016:19; Malhotra, Hall, Shaw & Oppenheim, 2004; Karasar, 1999:116).

Most of the theses which are already completed, they did not seem to follow the abovementioned sequence (Delice, 2010:2012). Therefore, flexibility in terms of the abovementioned sequence was accommodated to a certain extent for this study. The breakdown of the sample population for this study is as follows:

- SANRAL (state-owned enterprise) = One executive;
- Department of Transport (government department) = One executive;
- National Treasury (government department) = One executive;
- TRAC (concessionaire) = One executive;
- N3TC (concessionaire) = One executive;
- Bakwena (concessionaire) = One executive;
- OUTA (civil society group) = One executive;
- RFA (business) = One executive
- ANC and EFF (political parties) = One representative each; and
- SAFTU (trade union) = One representative.

In terms of accessibility to the above sample size, there was not a need to keep the sample size exceptionally large (Delice, 2010:2013). Therefore, the selection of the smaller sample size for this study still yielded credible and reliable findings and results.

5.8.1 Purposive or Judgement Sampling

In the purposive sampling, the researcher purposefully focuses on a particular group or subset of a population (Moffatt, 2015:54). Tashakkori and Teddlie (2003:713) and Maxwell (1996) further allude that purpose sampling is a technique or strategy in which people are intentionally chosen from specific settings in order to provide useful information that cannot be accessed by other means. Therefore, this sampling is based on the judgement of the researcher. In purposive sampling, the researcher intentionally or deliberately focuses on the qualities or characteristics that the participants possess (Etikan, Musa & Alkassim, 2016:2). In terms of this research study, the qualities or characteristics mentioned above are the expertise, knowledge and experience possessed by the participants. It is also important to mention that all of the participants willingly provided the information for this study.

Table 5.4: Strengths and Weaknesses of Sampling Techniques Sources

Technique	Strengths	Weaknesses
Purposive or judgement sample	Cost-effective, not time consuming, convenient and ideal for exploratory research .	The research design is subjective and does not allow for generalisation.

Source: Taherdoost (2016:23)

According to Table 5.4, purposive samples, regardless of the type of sampling method used, may be extremely vulnerable to researcher bias (Sharma, 2017:751). However, purpose sampling can cut costs and save time. On the downside, purposive sampling suffers from a significant drawback when judgments are made without clear criteria (Sharma, 2017:752). The criteria or sequence (paragraph 5.7) is critical for the realisation of credible and reliable findings and results even though it allows for a certain degree of flexibility.

5.8.1.1 Expert Sampling

This study adopted expert analysis which is a type of purposive sampling. Expert sampling allows for experts in a particular field of study to be the subjects for purposive sampling (Etikan et al., 2016:3). Therefore, in this research study, experts were interviewed as participants to explore new areas of research. When investigating new areas of research, expert sampling is a useful method to determine whether further research is worthwhile (Etikan et al., 2016:3). In the case of this research study, a necessity for further research was found to be justified.

5.8.2 Theoretical Sampling

In situations where the researcher knows the population, using a theoretical sample is appropriate. Although the theoretical sample is not randomly selected, individual participants from within the theoretical sample can be chosen at random in order to achieve an approximate effect (Glasow, 2005:2-2). The participants identified for this research study were not randomly chosen but rather the selection process was based on their experiences, expertise and knowledge. Theoretical samples purposively choose organisations that exhibit the desirable features that the research study is interested in (Attewell & Rule, 1991:300). Groups, individuals or settings are chosen for theory-based sampling because they assist the qualitative researcher in developing a theory (Omona, 2013:180). This study presents an appropriate model for toll road concessions. In achieving its purpose, theoretical sampling develops and expands on a theory. This sampling scheme is also employed in the expansion of a theory (Omona, 2013:180). The quality management of this study is discussed in detail below.

5.9 QUALITY MANAGEMENT

The two-quality management analysis techniques are qualitative content analysis and thematic analysis. Both are discussed below.

5.9.1 Qualitative Content Analysis

Due to the use of text data, this study adopted the qualitative content analysis method because of its **inductive nature**. Zhang and Wildemuth (2009:318) posit that a qualitative content analysis is primarily inductive in nature and lays the foundation for the examination of themes and topics in addition to the inferences that are drawn from

them in the form of data. Hsieh et al. (2005:1278) allude that one of the many research methods for analysing text data is qualitative content analysis. In consequence, the text data can be verbal, written or digital, and can come from interviews, focus groups, narrative responses, observations, open-ended survey questions, or print media such as articles, books or manuals (Kondracki & Wellman, 2002). However, the text data should be organised first before analysis or interpretation can take place and the text data cannot be used in its raw form. Text data must be reduced to concepts that explain the research phenomenon (social reality) by developing concepts, categories, a conceptual system, a model or a conceptual map as a prerequisite for accurate content analysis (Zhang et al., 2009:318; Elo & Kyngäs, 2008). The qualitative content analysis method can be defined as:

- *“Any qualitative data minimisation and sense-making effort that aims to identify core consistencies and meanings from a large volume of qualitative data.”* (Patton, 2002:453);
- *“A research method for subjectively interpreting the content of text data using a pattern-finding technique and systematic classification process coding.”* (Hsieh et al., 2005:1278); and
- *“An approach of methodologically and empirically controlled analysis of texts within their communication context, using step-by-step models and content analytic rules in order to avoid rash quantification.”* (Mayring, 2000:2).

These three definitions show that a qualitative content analysis prioritises a holistic view of speech/texts and their precise contexts (Zhang et al., 2009:318). Put simply, qualitative content analysis describes the process of examining the content of a document but encompasses more than just counting words or extracting objective content from the texts as it often considers the meanings, themes and patterns that may be apparent or hidden in a particular text (Zhang et al., 2009:318). Qualitative content analysis follows three fundamental principles of the scientific method, and these are as follows:

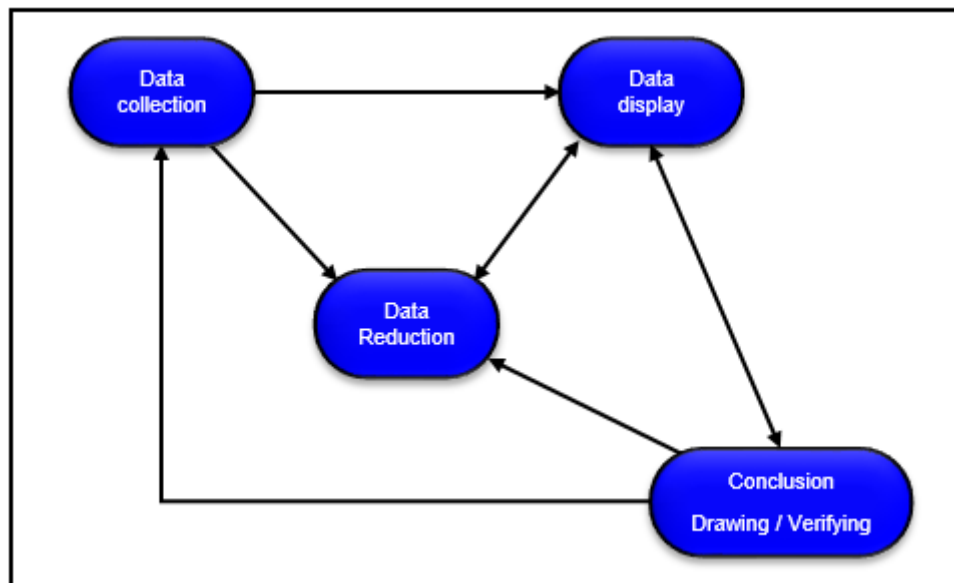
- **Objectivity:** the analysis is conducted in accordance with explicit guidelines, allowing different researchers to obtain the same results from the same messages or documents;

- **Systematic:** content is excluded or included according to a set of consistent rules, which eliminates the risk of only using materials that support the researcher's ideas; and
- **Generalisability:** the researcher's findings or results can be extended to other related circumstances (Prasad, 2008:175).

Based on the three fundamental principles of the scientific method highlighted above, this research study's results can be expanded or transferred to other similar settings, and a vast variety of materials can be utilised by following and abiding to specific regulations.

5.9.2 Thematic Analysis

Thematic analysis forms part of the qualitative analysis tool. Thematic analysis is an approach for systematically organising, identifying and providing insight into themes (patterns of meaning) in relation to a data set (Braun & Clarke, 2012:2). Namey, Guest, Thairu and Johnson (2008:138) allude that thematic analysis focuses on explaining and identifying both implicit and explicit ideas, and codes produced for ideas or themes are either applied or connected to raw data as summary markers for later analysis. For the purposes of this study, implicit and explicit ideas and codes were decoded and explained in order to make sense of the research data. This is a method for identifying and making sense of what is common to the way a topic is discussed or written about (Braun et al., 2012:2). Therefore, this method assisted this research study to look for code co-occurrence by comparing the relative frequencies of themes or topics within a data set.



Source: Miles and Huberman (1994)

Figure 5.2: Model for the Thematic Analysis Process

Figure 5.2 illustrates the three stages of a thematic analysis and how they relate to each other. Crucially, these stages concentrate on visualising the data by using a variety of display techniques such as statistics, quotations and narrative text, as well as tabulating the similarities and differences and clarifying the relationship and its associated complexity (Miles & Huberman, 1994; Gibbs, 2002; Yin, 2010).

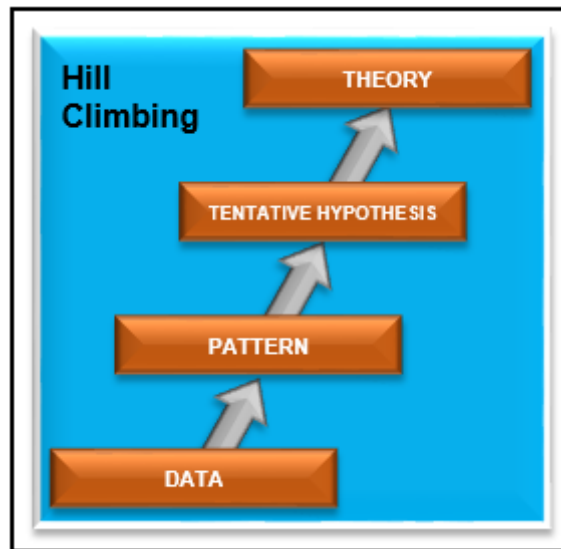
5.9.2.1 Approaches Appropriate for Thematic Analysis

Thematic analysis is versatile enough to be used for both deductive and inductive approaches, and this research study used a combination of these two approaches, which are discussed below.

a. Inductive Approach

One part of this research study was to gather the relevant data based on research questions in order to enable the inductive process to successfully unfold. When utilising an inductive approach, the majority of the data gathered will begin with specific content, then progress to wider generalisations and finally theories (Alhojailan, 2012:41). Bengtsson (2016:9-10) further alludes that the process of producing conclusions from the gathered data by weaving new information into theories is known as inductive reasoning. In the context of this research study, the inductive approach

enabled the text to be evaluated with an open mind which led to the conclusion as determined by the data that was collected.



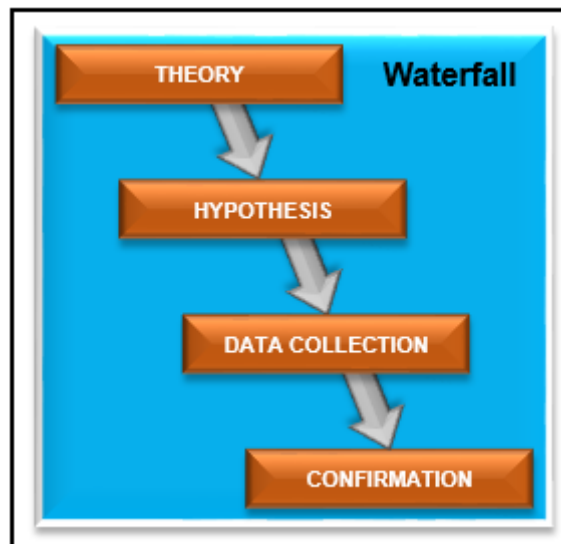
Source: Malhorta (2017:173)

Figure 5.3: "Bottom-Up" Approach

Based on the above figure regarding the inductive approach, when a significant amount of data has been gathered, the next step is to identify patterns from the data and then develop a preliminary hypothesis which leads to a new theory. Therefore, the inductive approach prompted this research study to move from data to theory. That being said, deductive reasoning does not have to be excluded from a qualitative content analysis (Patton, 2002).

b. Deductive Approach

Unlike an inductive approach, a deductive approach begins with the existing theory, which is followed by the use of the data collected to test a hypothesis. In support hereof, Malhotra (2017:173) posits that the inductive approach starts with a preliminary hypothesis or set of hypotheses that form a theory which could provide a potential solution or explanation for a specific problem and then continues to rigorously test the hypotheses using data collection.



Source: Malhorta (2017:173)

Figure 5.4: "Top-Down" Approach

According to the Figure 5.4, the deductive approach is the inverse of the inductive approach (Malhorta, 2017:173). The deductive process begins with the existing theory which is well-established, then paves the way for the establishment of a hypothesis which needs to be tested, and is followed by the data collection process to confirm (results analysis) whether the data support or reject the hypothesis. The trustworthiness of data collection methods is thoroughly discussed in the next section.

5.10 TRUSTWORTHINESS OF DATA COLLECTION METHODS/INSTRUMENTS

Conformability, authenticity, dependability, transferability and credibility are all concepts used to describe the trustworthiness of a qualitative content analysis (Elo, Kääriäinen, Kanste, Pölkki, Utriainen & Kyngäs, 2014:1). All these concepts were appropriately used in this research study. Unlike quantitative researchers who use statistical methods to determine the validity and reliability of research results, qualitative researchers strive to design and implement methodological techniques or concepts that ensure the trustworthiness of the findings (Noble & Smith, 2015:3). Therefore, the concepts of conformability, authenticity, dependability, transferability, and credibility were used to ensure the trustworthiness of the results in this study, and these are discussed below.

5.10.1 Conformability

Conformability relates to objectivity that has the prospect of achieving congruence of two or more independent individuals to agree on the relevance, accuracy, meaning or significance of data (Elo et al., 2014:2). Neutrality by two or more individuals counts most in this technique in order to eliminate biases and personal interests of which this study achieved.

5.10.2 Credibility

In order to achieve credibility, the respondents chosen for participation in the study must be true representatives who can accurately describe the phenomenon (Mandal, 2018:594). Therefore, this study sought to attain the truth about the phenomenon from the participants, which gives value to the findings.

5.10.3 Transferability

Transferability refers to whether the study conclusions and obtained results from the analysis can be administered to other similar contexts and settings (Mabuza, Govender, Ogunbanjo & Mash, 2014:3). This research study ensures the element of transferability, in that the results of this study can be applied or transferred to other similar settings and contexts.

5.10.4 Dependability

The data's stability over time and under various conditions is referred to as dependability (Elo et al., 2014:4). To ensure consistency, this study's results and findings can be replicated in the same context with the same participants. The next section focuses on the reliability and validity for qualitative research.

5.11 RELIABILITY AND VALIDITY FOR QUALITATIVE RESEARCH

For assessing or evaluating the scientific merit of qualitative research, qualitative researchers often avoid terms like validity and reliability and instead use terms like credibility, conformability, truth, applicability, value, trustworthiness and consistency (Leininger, 1991). There are several reasons why qualitative researchers avoid the use of these terms (validity and reliability), and one of these reasons is error as a threat to validity and reliability. According to Mohajan (2017:15), the major sources of validity and reliability errors are as a result of recklessness from the researcher, social setting,

the respondents participating in the study and the methods used for the data analysis and gathering. Validity and reliability are two aspects that can determine whether the research is poor or good.

5.11.1 Validity

The term 'validity' in scientific study is concerned with the truthfulness and accuracy of scientific results (Le Compe & Goetz, 1982:32). To achieve a high degree of truthfulness and accuracy in this research study, the correct processes and tools were used. In qualitative research, validity refers to the extent to which the data is credible, plausible and trustworthy, and how well it can be defended when questioned (Bashir, Afzal & Azeem, 2008:35). It was therefore necessary that this study pursue valid conclusions and results to withstand any scientific scrutiny. In terms of presenting the analysis, the validity should reflect the following:

- The effect of the research design and analysis approach on the findings you present;
- The consistency of the findings, such as when more than one researcher conducted the study (often referred to as inter-rater reliability);
- The degree to which all possible viewpoints are represented, such as by looking for 'negative' or deviant cases to test interpretations; and
- Appropriate and systematic use of the original data (for example, using quotes from different people) in the presentation of the analysis so that readers are assured that the interpretations of findings are based on the data collected (Lacey & Luff, 2009:27).

In terms of the above, validity is concerned with the application and integrity of the methods used, as well as the precision with which the results or findings accurately represent the data collected (Long & Johnson, 2000). The precision in which the findings accurately reflect the data collected will require some level of testing. As a result, more defensible and credible results can lead to generalisability if the trustworthiness or validity can be tested (Johnson, 1997:283). When the validity of a study is tested and yields credible and defensible results, then the data analysis, gathering techniques and the instrument used will be justified since the claim of validity rests on these (Bashir et al., 2008:43). Two types of validity are discussed below.

5.11.1.1 Content Validity

The degree to which one can generalise from a specific collection of items to all possible items in a wider domain is known as content validity. Content validity aims to achieve as representative a collection of an item's material and appropriate content as possible (Patrick, Burke, Gwaltney, Leidy, Martin, Molsen & Ring, 2011:267; Nunally & Bernstein, 1994:104). Content validity plays a vital role in this research study in the sense that the content is generalised based on the particular collection of items and the viewpoints of the participants are comprehensively detailed. Content validity is the measurement property that determines whether the data collected are extensive and adequately reflect the participants' perspectives for the population of interest (Brod, Tesler & Christensen, 2009:1263).

5.11.1.2 Criterion Validity

Although the secondary criteria for validity are not as broad as the primary criteria and do not directly map with the primary criteria, they are important standards for quality as identified in the literature (Whittemore, Chase & Mandle, 2001:531). It is important to highlight that this research study used both secondary and primary criteria of validity since they are complementary. Primary criteria are necessary to all qualitative inquiries, however, they are insufficient in and of themselves. Secondary criteria provide additional benchmarks for quality and are considered to be more flexible when applied to particular investigations (Whittemore et al., 2001:529).

Table 5.5: Criterion Validity Development

Author	Criterion Validity
Altheide and Johnson (1994)	Credibility, importance of topic, plausibility, relevance
Eisenhart and Howe (1992)	Appropriateness, credibility, significance, completeness, comprehensiveness
Leininger (1994)	Confirmability, credibility, saturation, recurrent transferability, meaning in context, patterning
Lincoln (1995)	Community as arbiter, positionality, sharing perquisites of privilege, critical subjectivity, reciprocity, sacredness, voice
Lincoln and Guba (1985)	Applicability, neutrality, consistency, truth value
Guba and Lincoln (1989); Marshall (1990)	Canons of evidence, goodness
Maxwell (1992, 1996)	Evaluative validity, theoretical validity, interpretive validity, descriptive validity, generalizability
Sandelowski (1986, 1993)	Auditability, artfulness, confirmability, creativity, credibility, fittingness
Smith (1990)	Ethical and moral components
Thorne (1997)	Analytic logic, interpretive authority, methodological integrity, representative credibility

Source: Compiled by Whittemore et al., (2001:529)

According to Table 5.5, being able to expand an explanation to other particular situations, periods, populations and locations is a form of generalisation validity, and it typically happens in qualitative research through the formulation of theories that can explain broader and more diverse situations (Hayashi Jr, Abib & Hoppen, 2019:101). Therefore, this research study attempted to broaden the explanation of specific situations, periods, populations and locations by guaranteeing data consistency. The term 'theoretical validity' refers to how consistent the data is with the theoretical explication, explanation or elaboration produced by the research analysis (Onwuegbuzie & Johnson, 2006). In the context of this research study, the researcher does not embellish or misrepresent the details or information of descriptive validity, and the situations and findings documented and reported herein are those that were seen and heard (Hayashi Jr et al., 2019:100).

5.11.2 Reliability

According to Joppe (2000:1), the degree to which findings are consistent over time and reflect an accurate representation of the total population investigated is described as reliability, and if the results of a study can be replicated using similar methodology, the research instrument is considered to be reliable. This implies that when the same process is repeated under a similar methodology, then this research study will be able to achieve consistent results. In support hereof, Mohajan (2017:14) posits that the replicability, dependability and consistency of any research findings are all aspects of reliability, and that a definition of reliability in qualitative research with various paradigms is difficult and epistemologically counter-intuitive. Therefore, this research study aimed to achieve repeatable results. The repeatability of a research study is one of the most significant factors of its quality (McNeil & Chapman, 2005:9). However, in some studies, the sample size is larger than it should be for the sake of research reliability (Delice, 2010:2013). Instead, one should think about the following when explaining the reliability of analysis:

- Defining the approach to and the procedures for data analysis;
- Defending why these approaches are appropriate in the context of your research;
- The process of generating theories, themes or concepts from the data audit trail should be clearly documented; and
- External evidence, such as previous qualitative studies may be used to test the conclusions of your analysis when appropriate (Lacey et al., 2009:26).

Based on the above, reliability generates understanding in a qualitative approach (Stenbacka, 2001:551). This understanding was achieved by generating the concepts, theories and themes which this study sought to achieve. Reliability is synonymous with testing, and in the context of this study, reliability was achieved by testing the conclusions and findings from the data analysis to ensure the importance and quality of this study. The other main requirements of any research process are to test the reliability of the findings and data (Mohajan, 2017:14). The most important reason to achieve the highest-quality standards possible for this research study was to clarify expressions and eliminate confusion. Lengthening the measure, clarity of expression

and other informal means may enhance reliability (Mohajan, 2017:15). The ethical considerations for this study are discussed in the next section.

5.12 ETHICAL CONSIDERATIONS

There are several concerns involved with ethical considerations, such as the participants' informed consent, the description of the research in which the participants are involved, the person performing or conducting the research and the results (Rahman, 2017:107). The researcher for this study described the purpose of the study to all the participants and ensured that they signed their informed consent forms. Even when research participants are oblivious or unconcerned about ethics, it is the moral and professional responsibility of each individual researcher to be ethical (Neuman, 2011:143). The researcher in this study took it upon himself to ensure that all ethical considerations were adhered to.

5.13 CHAPTER SUMMARY

In this chapter, the research methodology was thoroughly described, and its impact to this study was also discussed. The characteristics of a qualitative method, such as word, patterns identification, social interaction, narrative, exploratory (inductive), images and immersion have been successfully infused into this study. The justification for the selection method of this study was also explained. Exploratory design was chosen for this study because few studies had been conducted in toll road concessions in SA. Purposive and theory samplings were chosen, the latter was chosen because this study seeks to develop or select an appropriate model for toll roads. The following chapter provides a presentation and discussion of the findings of this research study.

CHAPTER 6

PRESENTATION AND DISCUSSION OF THE FINDINGS OF THE STUDY

6.1 INTRODUCTION

The previous chapter highlighted that this study used document reviews (see par. 5.5.1) and interviews (see par. 5.5.2) as data collection methods. In this chapter, the interviews that were conducted with the relevant government departments, the state-owned enterprise (SOE), concessionaires, businesses, political parties, trade union and lobby group, as well as the various documents used, such as Acts, textbooks, journals, etc., are discussed in detail. The idea to involve such a wide sample was due to the fact that every sector of the economy, politics and society are directly or indirectly affected by the toll road concessions examined.

Interview sessions were held with participants (see Table. 5.2) from the Department of Transport, the National Treasury (Infrastructure Finance), the National Treasury (Transaction Advisory and PPP Unit in GTAC), the South African National Roads Agency, the N3 Toll Road concession, the Bakwena Platinum Corridor concession, the Trans African concessions, the Road Freight Association, the Organisation Undoing Tax Abuse, the African National Congress, the Economic Freedom Fighters and the South African Federation of Trade Unions. Most of the twelve participants who participated in this study are senior executives with vast experience in their different fields and their sectors are directly affected by the toll road concessions investigated.

The responses which best represent the experiences (see par. 5.5.1) and expertise (see par. 5.7.1.1) of the participants, literature on toll road concessions, the realities on the ground, and the politics and dynamics of PPPs, especially on the toll road concessions, shaped and informed the decision for the proposed model which formed part of the objectives of this study. The next section discusses data analysis and interpretation.

6.2 DISCUSSIONS OF DATA ANALYSIS AND INTERPRETATION

This research study used an interpretative approach so that the researcher could perceive the social world through the eyes of the participants and analyse their perceptions of the world (Edwards & Skinners, 2009). It must be deduced and

interpreted in a way that other people can easily comprehend and understand it (Khan, 2014:301). The goal is to simplify this research for readers.

This research generated vast amount of sources of data which needed to be analysed. For many researchers, the challenge with phenomenological research is that it creates a vast number of interview notes, tape recordings, jottings and other records, all of which must be analysed (Lester, 1999:1). It was a complex process to package the information for this study due to the substantial number of materials created or generated. Analysis is also inherently complex because data seldom falls into neat categories and there are several ways to connect various parts of observations or discussions (Lester, 1999:1). The next section deals with the findings on the toll roads concessions investigated.

6.3 FINDINGS FOR PPPS IN THE TOLL ROAD CONCESSIONS EXAMINED IN SA

This study collected data as widely as possible to get a representation of the various stakeholders with an interest in the toll road concessions investigated. Below is a depiction of the organisations that participated in this study.

Table 6.1: Organisations Participated in the Study

Section	Organisation	Type
Section A	• Department of Transport • National Treasury (Infrastructure Finance) • National Treasury (Transaction Advisory and PPP Unit in GTAC)	• National Government Departments
Section B	• South African National Roads Agency • N3 Toll Concession • Bakwena Platinum Corridor Concessionaire • Trans African Concessions	• State-Owned Enterprise • Concessionaires

Section	Organisation	Type
Section C	• Road Freight Association • Organisation Undoing Tax Abuse • South African Federation of Trade Unions	• Business • Civil Society Group • Trade Union
Section D	• African National Congress • Economic Freedom Fighters	• Political Parties

Source: Researcher

Table 6.1 indicates that the participants were divided into four sections and each section contains the name of the organisation represented in the study. The organisations were represented by individual members as follows:

Section A: Department of Transport = 1; National Treasury (Infrastructure Finance) = 1; and National Treasury (Transaction Advisory and PPP Unit in GTAC) = 1.

Section B: South African National Roads Agency = 1; N3 Toll Road concession = 1; Bakwena Platinum Corridor concession = 1; and Trans African concessions = 1.

Section C: Road Freight Association = 1; Organisation Undoing Tax Abuse = 1; and South African Federation of Trade Unions = 1.

Section D: African National Congress = 1; and Economic Freedom Fighters = 1.

Total number of participants = 12.

This section outlines the structure of findings and the next subsection focuses on the government department findings.

6.3.1 Section A: Findings on Government Departments

The responses of the participants in this subsection are analysed and interpreted as follows:

6.3.1.1 Interviews on compliance and implementation of existing policy, regulatory and legislative framework on PPPs

For PPPs to be effective in practice, there must be a policy, regulations and a legislative framework in place. In support of this assertion, the Asian Development Bank (ADB) (2008:14) alludes that a viable PPP requires enabling legal, policy and regulatory environments that are sufficiently reliable to promote private investment and participation. The policy, regulatory and legislative framework in PPPs must be seen as unambiguous measures that promote fairness and set an enabling environment for private investment. Laying down a policy and a legal regulatory framework that provides a fair return for investors and safeguards the interests of users, particularly the poor, and assures quality at a reasonable cost, is cited as a critical pre-requisite for attracting private partners to a PPP arrangement (Government of India, 2010:266). In a PPP environment, the lawmakers or parliamentarians are tasked with the responsibility of policy formulation. The legislative branch of a government, namely the law-making and elected parliament or assembly, can participate in the PPP process in a variety of ways, including establishing the PPP framework, setting limitations on PPP commitments, approving PPP projects and receiving and analysing PPP programme reports (International Bank for Reconstruction and Development (IBRD), 2014:114). Therefore, this subsection is focused on the existing policies and the regulatory and legislative frameworks for toll road concessions in SA.

a. Findings on the understanding of the term PPP from the regulatory point of view

For the government personnel to be more efficient at regulating PPPs, in particular those related to the toll road concessions in SA, they should be aided by the existing policy, regulatory and legislative framework for PPPs. A PPP is a long-term contract between a government institution and a private entity for the provision of a public asset or service, for which the private partner assumes major risk and management responsibilities and the remuneration is tied to performance (IBRD, 2014:14). The risk assumed by the private partner includes design, finance, operational, construction and technical risk. The objective of this interview question was to ascertain the knowledge and understanding of relevant government personnel regarding the concept of PPPs.

Participant 2 (National Treasury - GTAC)

“Basically, my understanding is based on what the regulation says with regard to PPP, which simply means that there should be a contract between the government institution and a private party, where the private institution will be performing an institutional function on behalf of that institution, bearing the financial, technical as well as the operational risk. In return the institution will then pay for those services that they will be receiving from the private party, whether through a budget or from the user pay.”

Participant 5 (Department of Transport)

“So, from the regulatory point of view, we needed to make provision for PPP because it was a new area that we were getting into, where we were going to use the private sector to assist with the delivery of public infrastructure. So SANRAL is one of the pioneering or the pilot companies that started with PPP through the road concessions. The regulatory framework was to find a legal means for government to implement PPPs. Therefore, SANRAL was central in the sense that it is an agency established through an act of parliament, and then the act of parliament gave SANRAL the powers to do PPPs but then there's still a principal act in National Treasury which made the provisions for PPPs possible and serves as the regulatory framework.”

Participant 8 (National Treasury –Infrastructure Finance)

“OK, my understanding of PPP is a partnership between a private sector institution and a public sector institution where the private sector provides a service that is usually provided by the public sector and the private sector then takes the necessary risk in terms of financial, technical and operational risks involved in that project, in the delivery of that particular project. Once that project has been completed, the private sector then takes the necessary or other benefits through the entire payments or payments that are made by the public sector to that particular private sector after the construction is done.”

Findings

From the above responses, it can be deduced that the government understands that PPPs in the SA context are not isolated from the regulatory framework and are therefore being implemented within the parameters of the regulatory and legislative framework. A legislative framework serves as a foundation for governments to regulate and ensure the delivery of public services to the general public, as well as to protect the rights of both customers and public service providers (Soyeju, 2013:818-819).

The participants also acknowledged the importance of a contractual agreement between the government agency and the private entity since the agreement governs and details the type of relationship established between both parties. According to Participant 5, the concessionaires perform the institutional function, by assuming the financial, technical as well as the operational risk on behalf of SANRAL (which is a PPP pioneering government agency), however, the National Treasury remains the principal in this arrangement for toll road concessions. In the midst of this, Participant 8 contended that the responsibility of providing road infrastructure to the public remains with the government, however, PPP arrangements allow or enable the private sector to assist in the delivery of basic public infrastructure, and in which the private entities are incentivised to assume the financial, technical and operational risks. In the context of the public sector's limited financial capacity, PPPs can provide a way to reduce spending, deliver new public services, restore existing infrastructure and build new infrastructure for public use (Amovic, Maksimovic & Buncic, 2020:1).

b. Findings on whether regulation and manuals (such as Public Finance Management Act, Regulation 16 of 1999 and PPP Manual governing the PPPs on toll road concessions in SA are still sound and adequate

Since 1994, when a new democracy was established, the South African government has developed regulatory and policy reforms aimed at alleviating the poor provision of infrastructure by upgrading the existing highways and implementing an electronic tolling system (Matsiliza, 2016:1). An example of one of these regulatory and policy reforms is the Public Finance Management Act, Regulation 16 of 1999 and PPP Manual. The key objectives of the PFMA and PPP Manual on PPP projects address

the transfer of technology, the maximisation of value for money, the transfer of key risks, greater transparency, reduced corruption, improved commercial performance, competitiveness, quality of service and efficiency (Institute for Public-Private Partnerships (IPPPs), 2009:13-14). In this interview question, the attempt is to establish whether the PFMA and PPP Manual are still sound and adequate.

Participant 5:

“Yes, I think so. I think one of the messages you can use to judge whether PFMA and PPP Manual are sound or not, is to check if there are any court cases, and there's none. That is the main indicator. You do have disputes, but it's more about not fulfilling contractual arrangements.”

Participant 8:

“Absolutely, I think they did for me, the Public Finance Management Act that we have in the country is one of the best, in fact, in the National Treasury. We have a number of African countries that come to South Africa to try and copy the way that we do things in terms of Public Finance Management Act as well as European regulations. So, I think they are definitely one of the best in the world, even if you were to take them outside the country and compare them with the regulations they have and the manuals that they have in other developed countries. The South African example is quoted in various publications, papers and research papers about its soundness in the way that PPPs are conducted.”

Findings

From the above responses, it can be deduced that the Public Finance Management Act, Regulation 16 of 1999 and PPP Manual are still sound and effective in governing the PPPs for the toll road concessions in SA. According to the responses, this could be confirmed by the fact that there have not been any court cases between SANRAL and the concessionaires, and a number of African countries are copying the PFMA and PPP Manual which are also being quoted in various publications, papers and research papers. However, according to the responses, disputes still occur in the form of performance appraisals (not fulfilling contractual arrangements). However, it is

important to note that these disputes are resolved outside of court. Irrespective of the positive response regarding toll roads disputes being resolved outside of court in SA, Kumaraswamy and Zhang (2001) cite many PPP cases regarding toll road disputes, with issues such as cost overruns, unrealistic pricing and revenue forecasts, and legal conflicts between the private and public sectors. Regardless of the competency of management and the financial strength of the contractor, accurate cost estimation at an early stage is the key to avoid cost overrun in projects (Hicks, 1992).

c. *Findings on whether SANRAL performs its functions in accordance with the SANRAL and National Roads Act, No. 7 of 1998, in terms of managing and controlling toll roads in SA*

In general, the toll road legislative framework has provisions prohibiting the accounting officer from approving projects without adequate prioritisation or feasibility studies, as well as from making future financial commitments for which there is no guaranteed source of funding (Queiroz, Astesiano & Serebrisky, 2014:13). The accounting officer in the context of SANRAL is the chief executive officer, and they are expected to adhere to the SANRAL and National Roads Act, No. 7 of 1998, by ensuring that the financial commitments that SANRAL has entered into with concessionaires are honoured and that proper feasibility studies are conducted. In terms of Section 28(3) of the SANRAL and National Roads Act, No. 7 of 1998, SANRAL as an agency transfers certain duties to concessionaires (authorised persons). Therefore, the concessionaires are legitimately performing SANRAL's duties since the Act is empowering them to do so. However, SANRAL retains monitoring powers over the concessionaires. This interview question aimed to determine what it is that SANRAL is doing to monitor the concessionaires and ensure their adherence to the SANRAL and National Roads Act, No. 7 of 1998.

Participant 5

“The fault is with the founding legislation of the agency. SANRAL got too much powers to do things unchecked.”

Participant 8

“Well, I don't know the SANRAL and National Roads Act, No. 7 of 1998. However, I can qualify it and said I can comment about this particular question within the context of PPPs and from what I know about PPPs, and from the way I know PPPs is that the delivery of the concessionaires in terms of their mandate to construct, design, construct and to build, maintain and basically operate, this in total has been very successful in South Africa. When you compare the roads that we have in South Africa they are the best in the world. They are part of the best thing that we can compare the routes that we have with the freeways in the United States or the Autobahn in Germany, because they are quite good.”

Findings

Based on the above responses, some participants from the government departments are of the view that SANRAL indeed ensures adherence to the National Roads Act, No. 7 of 1998, by seeing to it that the concessionaires are adequately performing their mandate of financing, constructing, designing, maintaining and operating, and that this can be verified by comparing the three toll roads investigated for this study with freeways in the United States or to the autobahn in Germany. However, the other view from the responses is that the National Roads Act gives SANRAL too much power to operate without being closely monitored (checks and balances) by the relevant government departments.

d. Findings on whether the toll road subsector in SA should have a regulatory body

The regulatory bodies are intended to promote the common good and protect consumers' and citizens' interests in general (Borges, 2013:2). In promoting the common good and protecting consumers' and citizens' interests, the regulatory authorities should ensure the enforcement of established laws without fear or favour. To regulate human behaviour, laws are enacted and regulatory authorities are established to enforce those laws (Murphy, 2017:43). There should be absolute independence and autonomy given to these bodies. The Norwegian government created a new regulatory policy in 2003 with the goal of making regulatory bodies stronger and more autonomous, as well as transferring some of them outside of Oslo

(capital city of Norway) (Christensen & Laegreid, 2007:499). This interview question sought to establish whether the toll road sector in SA should have its own regulatory body.

Participant 2

“The challenge with this one is that you are dealing with distance to determine the price, rather than dealing with Kilowatts, this is how much you can produce. So, with distance you do not produce the distance, you have to travel the distance. It becomes a problem to have someone sitting there and saying I am determining the price for you to travel from here to there, or for you to travel a 100km will cost you this much.”

Participant 5

“There is a need for a toll roads regulator, we need to do a better economic analysis to see that the consumer is not paying too much.”

Findings

There is disagreement on the establishment of regulatory body for toll road concessions in SA according to the responses. The first view expressed is that it is not going to be easy to determine the price because this sector deals with distance and not output such as electric or water services. Careful use of pricing that is differentiated by time and location can greatly improve rationing by queuing (first-come-first-serve queue) (Organisation for Economic Co-operation and Development, 2018:8). However, the second view emphasised the need to establish a regulatory body to deal with toll fees in a more transparent way and to consider alternative options rather than relying solely on the CPI adjustment. Alternative options could include service cost, pollution and congestion pricing as means of determining toll fees.

e. Findings on problem areas of policy and legislation that govern toll road concessions in SA

The objective of this interview question was to register any perceived problem in the policy and legislation that govern toll road concessions in SA.

Participant 8

*“It is around the consultation process. When government comes up with a toll road, there needs to be thorough **consultation process** to ensure that the public is aware that at this particular point there is going to be a toll road. And of course, most of the toll roads that we have were done quite early on during the tenure of the apartheid government and the ANC came and did the acquisitions early on at the start of democracy. But over time, the democracy that we have is kind matured, and we kind of know our rights and so on. So, what the Gauteng Freeway Improvement Plan (GFIP) brought to the fore, is lack of public consultation.”*

*“Part of the challenges that we have in PPPs, is that you have the public sector that goes into a PPP, but they don't quite **monitor** effectively the delivery of what the private sector is supposed to do. So, we always talk about a competent client. So, I would say SANRAL is a competent client in that it is able to monitor what is supposed to be done by the concessionaires and as a result, we are able to see a partnership that is working.”*

Findings

According to the above participant response, one of the problem areas of the policy and legislation that govern toll road concessions in SA is the way the consultation process is conducted, especially at the public level, and the GFIP was cited as an example. Due to a lack of information, the public frequently expresses unreasonable resentment towards toll roads (Meidutė & Paliulis, 2011:257). Therefore, the shortage of information caused by a lack of consultation in the PPP process has adverse consequences, especially in the toll road concession space (i.e. public resistance to the GFIP due to the protection of public interests in the PPP contract). The other problem cited regarding PPPs in general, regards a lack of monitoring over the private entities by government agencies. However, with regard to the toll road concessions, the view is that SANRAL is doing good work in terms of monitoring the concessionaires. According to Kusek and Rist (2004) monitoring defines a project's objectives, collects data on these indicators on a regular basis, translates objectives

into performance indicators, compares real results to targets, communicates progress to the management and notifies them of concerns or problems.

f. Findings on whether SANRAL ensures the compliance to the Cross-Border Road Transport Act, No. 4 of 1998, especially by TRAC (N4)

The Cross-Border Road Transport Act, No. 4 of 1998, is relevant to SANRAL in the sense that it provides more clarity on policy direction in terms of managing the N4 Toll Road concession which is shared by both South Africa and Mozambique and managed by TRAC. However, due to the nature of toll road projects, which are generally considered domestic assets and financed on a standalone basis, cross-border toll road projects are exceedingly rare (Verougstraete, 2018:8). Beside the N4 Toll Road concession, the other toll road cross-border agreement entailing a public-private partnership structure is between Canada and the State of Michigan (USA) for the designing, building, financing, operation and maintenance of the international crossing bridge through its entire life cycle (Lick & Hamlin, 2012:180). This interview question sought to establish how TRAC cooperates with the relevant government departments (Department of Home Affairs and South African Police Services) to ensure compliance to the Cross-Border Road Transport Act, No. 4 of 1998, for the N4 Toll Road concession.

Participant 5

“SADC has an association called ASANRA (Association of Southern African National Road Agencies), and member states share their toll road experiences in this forum.”

Findings

From the above response, it can be deduced that various governments in the region are discussing their experiences regarding toll roads on this platform (ASANRA), and it can be assumed that the cross-border issues and frustrations around toll roads are also being discussed on this platform. In the context of this study, in 1997, a 30-year concession contract was signed to rehabilitate and upgrade 390 kilometres of an existing road linking South Africa and Mozambique for an estimated total cost of \$660 million. A one-stop border facility was erected on this road concession, and to ensure

the viability of the project, both governments mandated a private party to collect tolls and jointly guaranteed its debt (Verougstraete, 2018:8).

A multidisciplinary approach is exercised by TRAC and the relevant governments' departments at the Lebombo border crossing control post to combat all types of crime (illegal firearms, human trafficking, illegal immigration, etc.) and traffic related issues. As a result of the two civil wars in Mozambique and Angola, a large number of firearms are still in circulation in Southern Africa (Hennop, Jefferson & McLean, 2001:1). Therefore, the multidisciplinary approach at the Lebombo border control is necessary to deal with these issues.

6.3.1.2 Interviews on the functions of SANRAL and the concessionaires for the toll road concessions investigated

In the toll roads subsector in SA, SANRAL has dispersed most of its functions to private parties (concessionaires). According to the economic ideology underlying a PPP, the private sector has well-organised management techniques, cost-cutting measures, economies of scale and the means for the timely completion of a project. These qualities place it ahead of the public sector in terms of efficiency (Hashmi, 2020:38). In this subsection, this study sought to determine whether SANRAL and the concessionaires are performing their functions properly.

a. Findings on whether SANRAL is adequately overseeing the planning, design, construction, operation, management, control, finance, maintenance and rehabilitation of the toll roads under examination which are performed by the concessionaires on its behalf.

One of the key differences between PPPs and traditional procurement is that the private party in a PPP is given the responsibility of sourcing finance for the infrastructure investment, finding potential investors and developing the project's financing structure (IBRD, 2014:49). After the finance has been secured and the planning, design and construction phases are concluded, the need for maintenance remains as long as the toll road exists and this ongoing need for maintenance should be factored into the project's financing structure. As a result, good infrastructure maintenance enhances the infrastructure's efficiency and longevity, assisting in the sustainability of a good economy and societal upliftment, thereby preserving the quality of life for many (Govender, 2019:497). James and Anne (2010) describe e-tolls

as a strategy to keep roads in a well-maintained state while lowering traffic congestion. It is therefore expected that the concessionaires will appropriately embark on planning, designing, constructing, maintaining, managing, controlling and financing of the toll roads and properly manage the costs associated with the operations. This interview question sought to establish whether SANRAL and the relevant government departments ensure that the concessionaires perform the abovementioned functions.

Participant 2

“What we do is provide technical advisory or assistance to the institution responsible for implementing, in this case, the government institution that has procured the private party. We then assist them in managing that agreement, we do that by being part of the steering committees that are managing that contract so that we can advise on issues that arise, and these might be challenges from both the government and the private party. If there is a need for a regulatory function, for example a variation or a scope increase, we then advise on how they can go about implementing that and what regulatory requirements are there. Our role is then to assist the government institution that has the contract, but not to manage it on behalf of them.”

Findings

According to the above response, some of the government departments provide technical advisory or assistance to SANRAL in areas where there is a capacity challenge. Therefore, it could be deduced that in cases where SANRAL is unable to adequately oversee the planning, design, construction, operation, management, control, finance, maintenance and rehabilitation of toll roads under examination, the relevant government departments get involved by providing the technical advisory or any other assistance that may be required to SANRAL. However, Section 4.3.1.1 of the National Treasury PPP Practice Note Number 01 of 2004, clearly states that SANRAL should ensure that it understands how the private party intends to deliver the project deliverables in terms of its subcontracting and financing arrangements and be satisfied that those arrangements (as reflected in the relevant project documents) are adequate to allow the private party to deliver the project deliverables. Where SANRAL is unable to fulfil this role adequately, the relevant government departments can assist

but should not interfere with the management of these contracts since SANRAL has sole mandate to deal with the management of these contracts.

6.3.1.3 Interviews on government departments' responsibilities for the management of PPP agreements in SA

The lack of appropriate public sector expertise in the management of PPPs is highlighted as a barrier that obstructs and complicates PPP implementation, demotivating private sector involvement, and in some circumstances, leading to the partnership's collapse (Babatunde, Perera, Udejaja & Zhou, 2014; Babatunde, Perera, Zhou & Udejaja, 2015; Chilala & Mulenga, 2017; Hall, 2006). In the context of the toll road concessions in SA, appropriate public sector expertise should be possessed by SANRAL and the relevant government departments. The Ministry of Finance, line ministries and executive agencies should work together to ensure that a coherent and consistent approach to public-private partnerships is implemented throughout the public sector and ensure that it is linked to other initiatives in related sectors (OECD, 2012:6). This subsection therefore focused on the management expertise of the PPPs possessed by SANRAL and the relevant government departments.

a. Findings on whether the relevant government departments are ensuring that SANRAL is adequately monitoring the performance of concessionaires in line with PPP agreement management, and that they themselves (government departments) are regulating the toll roads appropriately

According to Callistus and Clinton (2018:572), despite the abundance of evidence demonstrating monitoring's benefit to project implementation, monitoring has received little attention as a management practice. In support of this notion Adebayo, Eniowo and Ogunjobi (2018:177) posit that monitoring is a critical process in the management and delivery of a construction project. PPP projects cannot afford to give too little attention to monitoring as a management practice. Monitoring performance is a key activity of the contract and project management in the context of PPPs, and it is an important aspect of PPP policy in most countries (European Investment Bank (EIB), 2012). In the context of the toll road concessions investigated, SANRAL is expected to use monitoring as tool for measuring the performance of the concessionaires. "The act of quantifying the efficiency and effectiveness of action" is how performance measurement is defined (Neely, Gregory & Platts, 2005:1229). In terms of this

interview question, government departments were asked to explain their role of regulating toll roads and confirm whether SANRAL performs its monitoring responsibilities with regards to the concessionaires.

Participant 8

“Yes, our unit does, we regulate PPPs. I work in the budget office of the National Treasury, so we are the ones who give proper treasury approvals throughout the entire process from treasury approval all the way to financial closure. So, we make sure that before the agreements are issued out to the market, we review them, and when they have been issued out, we also reviewed them. Therefore, we review them as part of the financial closure period, which is the last stage of a pipe with the regard to PPP, where the government enters into an agreement, a formal agreement with the private sector.

Findings

The above response, reveal that the applicable government departments adequately support SANRAL for regulating the performance of the concessionaires in line with PPP agreement but that they do not monitor the concessionaires. Therefore, based on the above responses, SANRAL is the only institution permitted by law to monitor whether the concessionaires are adhering to the agreement and therefore the other relevant government departments simply support SANRAL by means of regulation.

b. Findings on whether the relevant government departments are adequately resolving disputes and differences with the private party on matters relating to PPP agreements

Due to the of the long-term nature of the agreement and the diversity of stakeholders with differing opinions and interests, conflict is unavoidable in PPPs (Osei-Kyei, Chan, Yu, Chen & Dansoh, 2018:1). Therefore, it is necessary for PPP stakeholders to brace themselves for possible disputes and put in place measures that will guide the dispute resolution process. This interview question sought to clarify the dispute resolution mechanism implemented by government personnel.

Participant 2

*“The performance monitoring unit of our unit is responsible for that. If there are **disputes** that arise, whether from the private party or the government side, then we try and control those things according to what is stipulated in the agreement in terms of dispute resolution. What we try to do from our side is to always be as objective as possible, even if it is the government that is at the wrong, we indicate that clearly, and then we assist them in remedying the situation and the same applies to the private party.”*

“But it is worth noting that there is a dispute resolution clause within the contract. If the dispute cannot be resolved at the technical level, it then moves up to the management level and if the management cannot resolve it, it then moves up to the steering committee where accountants from both parties will sit and resolve the issue.”

Participant 8

*“Yes, so the agreement is very detailed around how to go about resolving issues. Yes, we look at the draft agreement, there is a document called **Standardisation Provisions**, which is basically a draft agreement. It goes into detail around the processes that one needs to follow in resolving a dispute between the two parties. And then I think it goes into detail around **arbitration**, about around making sure that there is a **mediator** before it gets through to the **court** process.”*

Findings

The above responses reveal that the relevant government departments follow the **dispute resolution** mechanisms put in place to resolve contentious matters that arise in the toll road concession space. The above responses also reveal that the last resort of this process is to escalate the matter in dispute to the steering committee and that the Standardisation Provisions document outlines the process for dispute resolution. Kerf, Gray, Irwin, Levesque, Taylor and Klein (1998:165) outline the dispute resolution processes for PPPs as mediation, filing a complaint with a sector regulator, the judicial

system, a panel of specialists or experts to serve as arbitrators, and international arbitration.

c. *Findings on examples of disputes that the relevant government departments usually deal with in the toll road concessions space*

Disputes in PPPs occur due to a myriad of reasons. Lack of authority and low recognition, design omission, design error, the design not meeting specification, quality of work, cost overrun, the project falling behind schedule, conflict of loyalty, operational faults and bypassing a 'single' point of contact are some of the major conflicts and disputes noted at the inception, design, construction and project management stages (Gardiner & Simmons, 1992). This interview question aimed to document examples of disputes and conflicts experienced on the ground with regard to the toll road concessions in SA.

Participant 2

*"We have had some **disputes on the project that we are monitoring**, where there was an issue with tiles. The private party would say that they have cleaned these tiles and the government would say that they do not look clean, meaning that the private party did not meet the output specifications that were agreed upon."*

"The private party had to remove those tiles and replace them with ones that complied with the output specifications. In such cases we do have specifications, we resolved it, but we did not cost the government a cent because that is not part of our responsibility. Ours is to make sure that the service we signed up for is delivered."

Findings

According to the above response, the government does get entangled in disputes with private partners on matters relating to output specifications, and most importantly, these disputes have financial and time implications for either the private partner or SANRAL. To minimise the impact of time and financial implications in PPP projects due to disputes, precautionary measures should be taken proactively and these measures should comprise of additional preparation in preventive actions as this

should be beneficial to reduce the time and costs of both parties once disputes do occur (Chou and Lin, 2013:52).

6.3.1.4 Interviews on issues regarding PPP contractual agreements

This subsection discusses the dynamics of toll road concessions, ranging from risk transfer to value for money.

a. Findings on whether the relevant government departments have ensured that there is a transfer or allocation of design, technical, operational and financial risk to the private party in the contractual agreements for the PPPs investigated

In an ideal PPP arrangement, both the public and private partners share the risks and responsibilities (i.e. financial, operational, technical, design, social and economic) for the purpose of providing public infrastructure-based products and/or services (Grimsey & Lewis, 2004). However, in the South African context, the private party usually assumes substantial financial, technical and operational risks in connection with the performance of their institutional function and/or the use of state property (Accounting Standards Board, 2008:10). However, it should be noted that assuming more risk in a PPP arrangement means more benefits. Swai, Anasel and Masue (2018:105) and Verweij, Teisman and Gerrits (2017:122-123) contend that, in practice, the responsibilities and risks in PPPs are not always evenly shared and that the party who bears the brunt of the responsibilities and risks has a dominant and overriding say in decisions, posing public policy challenges. Pfisterer, de Boer, Mudde, van Dijk and van Tulder (2009) further state that risk transfer has a direct impact on profit sharing and results in PPP partners not always sharing costs and gains evenly. It should also be noted that risk transfer in other instances is inevitable. Despite transferring risk to the private partner, a PPP's risk is a visceral and continuing property that can never be completely avoided or transferred (Walwyn & Nkolele, 2018:4). Therefore, this interview question aimed to establish if the relevant units of the government departments have assured that the appropriate design, technical, operational and financial risks are transferred to the three concessionaires investigated for this study.

Participant 2

“We always maintain that one, basing it on the structure of the project that we are doing. Those are the basic, most important things that we need to make sure we adhere to. There should be that risk transfer then it translates into the design, financing, management and operations of that, so once we agree that we are going to pay this much on a monthly basis for this service, then it is up to the private party to make sure that they fulfil all required output specifications. If one or two of those output specifications are not fulfilled, then we have to specify that the non-availability of the service that we wanted, but we always make sure that those things are important and the project delivers.”

Participant 8

“OK, I would think that the way that we do PPPs is exactly that because you look at the way the toll road concessions at the moment, who maintains them, who collects the toll fees, who operate the tollgates, is the private sector. So, I think appropriate risk was indeed transferred to the private sector in the delivery of the project.”

Findings

The above responses reveal that the relevant units of government departments do ensure that there is a transfer of design, operational and financial risk to the private party. One of the most important principles of risk allocation in a PPP arrangement is that each risk should be assigned to the person who can best manage it (International Bank for Reconstruction and Development (IBRD), 2014:150). There is an assumption that the PPP risk is managed better by the private sector. Van den Hurk (2018) views the private party as the only option for assuming the risk associated with a PPP project, thus generating optimum outputs.

b. Findings on whether relevant government departments have ensured, by means of feasibility studies, that SANRAL can afford to enter into the contractual agreements with the concessionaires and that there is a commercial viability

In determining that SANRAL was able to enter into the concessions examined for this study, a feasibility study was undertaken. Mukherjee and Roy (2017:98) categorise feasibility studies into operation, legal, technical, scheduling and economic feasibilities. Therefore, the feasibility study should determine whether the PPP projects being investigated provide value for money. For a PPP to be justifiable it must provide value for money (Jomo, Chowdhury, Sharma & Platz, 2016:12). However, VFM requirements are not given priority in some PPP projects but rather the commercial viability (profit, capital and operating costs) of the project is given more priority. When it comes to toll roads, the most common consideration is whether the revenue will be sufficient to cover the capital and operating costs while still generating a profit, instead of ensuring that the net social benefits include VFM (Newbery, 2000). Typically, prioritising returns or profit entails a financial analysis, which further entails developing a project financial model and examining returns, financial robustness and project cash flows (IBRD, 2014:131). This interview question aimed to determine the preparedness of SANRAL when it was entering into contractual agreements with the concessionaires.

Participant 2

*“What we have done from treasury side, and this was done in the early 2000s because they were the first ones (SANRAL) to move into the PPP space, so part of the development of the PPP manual was also based on the projects that they have also done, and they had the capacity to do these projects internally. They then had to get an exemption to receive treasury approvals, those approvals then became an institutional approval meaning that the board was now responsible for approving institutional approval one for the **feasibility study**, two for the **value for money** report, and three for the **PPP agreement**. All of those were then transferred to them on the basis that they had the capacity and the knowledge of implementing the regulations, basically the regulations were based on the processes that they have already done. So, there were expertise on doing that.”*

Participant 8

“Yes, so Treasury Regulation 16 that governs or regulates PPPs provides us as the national treasury with the ability to exempt certain institutions from complying with Treasury Regulations 16. SANRAL was one of the institutions that was exempted from complying with Treasury Regulation 16. In other words, they did not have to come to the National Treasury for treasury approval. They would do that diligence on their own without any approval from the National Treasury.”

Findings

From the above responses, it can be deduced that the National Treasury personnel relied upon SANRAL to furnish them with the results of the feasibility studies since it had the capacity and approval to do so. According to Krieger, Martig, van den Brink and Berger (2016), a feasibility study is a technique for predicting the outcome of an assessment, examination or investigation of a proposed scheme, as well as the potential profit. The IBRD (2014:130) further alludes that the PPP project should be tested against legal, technical, social sustainability and environmental feasibilities. As a result, developing value-added infrastructure projects can be defined as a method of increasing project feasibility through innovation, efficiency and technology transfer, thereby maximising the benefits for all of the stakeholders through multi-sector collaboration in the development of integrated and multi-functional public projects (Berawi, 2019:1). In the context of this study, the chief executive officer of SANRAL had to oversee the feasibility study process to ensure that it satisfies the conditions of the PFMA. However, based on the responses, SANRAL did conduct a feasibility study out of its own interest because it was exempted from complying with the PFMA.

c. Findings on whether the relevant government departments have ensured, by means of contractual agreements, that the concessions investigated provide value for money

Value for money as a concept in PPPs should be prioritised. However, in practice, the value for money goal is frequently blurred and the decision to use a PPP may be influenced by considerations other than value for money (Burger & Hawkesworth, 2011:2). Therefore, this interview question aimed to determine whether the objective

of value for money was considered or prioritised when establishing the three toll road concessions investigated for this study.

Participant 2

*“I think they do, remember the basic principle of entering into a PPP agreement is to ensure you have **risk transference** and the project is affordable and provides **value for money**, so if one of those things is not there then you do not have a PPP. So, for the fact that those agreements are still running that means that there are still deriving the value for money, and there is risk transfer and they are still affordable. So yes, I would agree that they are still providing value for money.”*

Participant 8

*“Absolutely, that is what we do. That is our primary job, to make sure that we do PPPs not just because we want private sector and we like the private sector, but we believe because the private sector brings in a value addition to the public sector in terms of the way that they design, the way that they construct on time and on budget as well as they did, the way that they are able to absorb all the risks that are associated with the delivery of a certain type of infrastructure. So as part of our work, we can look at the agreements to ensure that they reflect that **value for money** additions in PPPs.”*

Findings

According to the above responses, the government personnel did ensure that the concessions provided value for money. The public sector uses cost-benefit analysis to determine whether the PPP project will yield the expected value for money. Cost-benefit analysis begins at the diagnostic stage and continues as an iterative analysis of the PPP structure as investment evolves throughout the process (Asian Development Bank, 2008:19). Therefore, the cost-benefit analysis should be observed in every stage of the PPP process to ensure that VFM is achieved. In ensuring that VFM is achieved, PPPs should deliver better service at better costs than traditional public projects (Leigland, 2018:108). However, there is a counter argument to this notion, Bayliss and Van Waeyenberge (2017) argue that the social costs of PPP projects are sometimes overlooked when calculating VFM. For example, a private

party may economically execute a project while saving costs by employee downsizing and imposing additional load on existing employees, and in support of this narrative, Hashmi (2020:40-41) further argues that, in comparison to traditional procurement, tendering and monitoring fees increase the entire cost of the PPP project by ten to twenty percent, and the high cost of capital, building and operation, including legal and financial consultant fees, makes a PPP twenty-five percent more expensive than conventional procurement.

Another response from above posits that the basic principle of entering into a PPP agreement is to ensure you have risk transfer and that the project is affordable and provides VFM. The design, building and operational risks are mostly outsourced to the private sector in a PPP arrangement (Fernandez, Carraro & Hillbrecht, 2016:372). In terms of the principle of VFM, it should never be about affordability or cost-effectiveness alone but should also consider the quality of the service offered.

6.3.1.5 Interviews on the reasons for the adoption of the DCFOM model

The results show that the five most important reasons for adopting a PPP reference model are that it enables risk transfer, it minimises the administrative cost for public sector, it minimises the budget constraint on the public sector, the private sector possess better mobility and the ability of the private sector to raise funds for the project (Robert, Dansoh & Kuragu, 2014:1). The concessionaires, as the private parties in the context of this study, were expected to be guided by the PPP reference model (DCFOM) to achieve the specified outputs. Therefore, this subsection aimed to evaluate the suitability of the adopted PPP model in terms of project structure, risk of designs, technical expertise and political will.

a. Findings on whether evidence based technical expertise or political influence have contributed to the selection of the DCFOM model for the three toll road concessions investigated

According to Prieto (2012:4), the DCFOM model is economically driven, and politically and technically constrained. However, politics have a way of influencing decisions regarding the adoption of a PPP model despite the constraints presented to them. Gawel (2011:1) argues that political involvement could be both a driver and a barrier for effective PPPs and is likely to reduce efficiency in either case. Therefore, PPPs cannot exist without the political buy-in, no matter the amount of technical and

economic expertise the private partner has. However, as much as politics are important in the formation of PPPs, the downside is that politics can be susceptible to corrupt activities. The amount to which public power is exercised for private benefit, including both small and grand types of corruption, as well as the 'capture' of the state by elites and private interests, translate into corrupt capture (Kaufmann, Kraay & Mastruzzi, 2010:4). The control of corruption, on the other hand, is merely an indirect sign of a government's capacity to implement and formulate an effective policy (Reyes-Tagle & Garbacik, 2016:4). This interview question aimed to determine the significance of technical expertise and political influence in PPPs.

Participant 2

"With us, I think we are fortunate we have regulations that guide the whole process. That process removes it from the politics because the politics are based on the feelings, and we are using feasibility studies to determine whether this project can be done or cannot be done and that is evidence-based. However, you will still need the support of the politics for you to implement it, so if you do not have that support, but it is easy to get that support of the politics if you have the facts on the table in terms of how is this going to operate and how much is it going to cost and how is the structuring and all of those things, rather than saying the politicians have to make a decision on something they are not sure on whether it is going to work or not. Ours is basically evidence-based but with the support of the politicians."

Participant 8

"I think it is both, in the sense that there is no project that can be implemented if it does not have the political support. Right. So, when we talk about projects, we all remember, politicians are the ones who are elected in power. Therefore, they are the ones who initiate projects. Without the necessary political influence or the political support, no project can ever be implemented. So, there is a lot of political influence. But is that wrong? No, not necessarily, to an extent that political support over the project is still subjected to the technical rigor of analysis. But a point when politicians just decide on projects without necessarily involving the technical and legal expertise of doing a particular project, then that

would be a problem. But for me, I think the projects were put through a process where there were feasibility studies done, where there were financial models done, even though they had political support. That's why the projects were eventually successful."

Findings

According to the responses, evidence based technical expertise was at the forefront for the adoption of the DCFOM model in all three of the toll road concessions investigated. However, there is an acknowledgement that without political intervention, or the role of politicians and other stakeholders, these three road concessions would not have existed today. Even after a feasibility study, most politically motivated PPP projects are found to be failing, resulting in a waste of resources and time (Hashmi, 2020:117). Therefore, it is necessary to moderate and control political influence in a PPP project as a means of avoiding project failure. Again, based on the responses, the selection of the appropriate PPP model requires the legal and technical rigor of analysis (which includes feasibility studies and financial modelling) and that politics should play a secondary role at this stage of the process or be temporarily set aside.

b. Findings on the strengths and weaknesses of the DCFOM model in relation to the toll road concessions under examination

Every PPP model should satisfy specific requirements. The PPP model should be guided by three principles: (1) the government can succeed in delivering public infrastructure; (2) the private sector can generate sufficient profit; and (3) the community pricing for providing infrastructure services should be justifiable (Berawi, 2019:1). A PPP model that does not satisfy these expectations may face public scrutiny from civil society, the government, user groups, news media and others (Leigland, 2018:108). Therefore, this interview question aimed to establish the strengths and weaknesses of the DCFOM model in relation to the toll road concessions investigated.

Participant 5

*“So, the model is wrong in the sense that SANRAL (Agency) have been given too much powers. Therefore, SANRAL will do everything on its own, and most of the time correctly because the law enables it to do so. However, SANRAL does all these unchecked by the department, and that is where the fault is. The fault is not with the PPP concept. Another problem is that our model is based on **traffic volume** and this benefits the heavy vehicles in the sense that they (heavy vehicles) are causing more damage to the toll roads while paying less.”*

Participant 8

“Well. I think the strength is that the government has entered into an agreement with a private party that is able to deliver on the road, and the government does not take the risk of demand shortfall for this particular case. I mean, the private sector has borrowed money from banks in order to build the roads and it uses the revenue generated from the tolls to pay back the debt, and make a bit of profit, not even a profit. So, the way this contract is structured is that if there is a revenue shortfall, for example, the road is not as busy and as a result, the private sector is not able to raise the kind of revenue envisaged, then the private sector takes those risks. OK, so they absorb that particular risk, whereas with the Gautrain, for example, the private sector is guaranteed a certain amount of money and the demand risk is taken by government as opposed to the private sector. So that is a big strength in the way that SANRAL was able to negotiate this deal, because what it means is that government now, because of COVID-19, the numbers have gone down, so government does not have to worry, it is the private sector's worry if there are not enough people passing through this toll. So, I think that is not a major plus.”

Findings

According to Participant 5's response, the first flaw or weakness of this model is that SANRAL is given too much power (i.e. SANRAL is both the referee and a player) and further states that the SANRAL and National Roads Act, No. 7 of 1998, enables this transfer of giving too much power to SANRAL. The second point highlighted by

Participant 5 is that, due to this model being based on traffic volume, heavy-duty vehicles benefit more when compared to other types of vehicles in that they inflict more damage to the toll road infrastructure without incurring serious consequences. A road system that accommodates both trucks and cars is more costly than a road system that only accommodates smaller trucks and cars (Hau, 1992:ii). However, it should be noted that while heavy vehicles undoubtedly cause more damage to the infrastructure, they are charged more at toll gantries and weighbridges to compensate for this. In terms of the strength of this model, Participant 8 alludes that the demand risk is not the burden of the government in toll road concessions, and if some big event happens that leads to a revenue shortfall, the government will not be as severely affected since the concessionaires are the ones who assume this risk. In March 2020, the government implemented a social lockdown to slow the spread of the COVID-19 virus and to prepare the health system to assist the sick. This lockdown resulted in a massive closure of industries where supply was seriously disrupted which could be better described as an abrupt stop event (Burger & Calitz, 2021:3). This colossal event had an adverse impact on the toll road concessions in SA and the concessionaires were forced to find ways to recover the revenue shortfall caused by the pandemic.

c. Findings on the reasons that prompted the adoption of a single model for all three of the toll road concessions under investigation

The PPP model is based on key motivations and benefits. Off-balance sheet financing of infrastructure projects, risk transfer to the private sector and enhancing the efficiency and effectiveness of infrastructure development and management have all been key motivations for choosing PPPs (McQuaid & Scherrer, 2010; European PPP Expertise Centre, 2015). Although there are other motivations and benefits that prompt the adoption of a PPP model, the fundamental issue is that the policy and regulatory reasons for the adoption of a PPP model should be dealt with at the political level. The concerns surrounding PPPs can only be addressed and managed with predictability and stability if the political level is aware of, and acknowledges, the benefits and costs of utilising PPPs (OECD, 2012:6). For all three of the toll road concessions investigated for this study, one single PPP model (DCFOM) has been adopted despite each concession's unique circumstances. Therefore, this interview question aimed to determine the policy and regulatory reasons behind the adoption of a single model for all three of the toll road concessions investigated.

Participant 5

“The government did not have enough money to rollout the toll road infrastructure on its own hence the invitation to private sector. So, the private sector build, operate and transfer later, but the government also giving them the flexibility to design because they will obviously look at economic design. Because private sector will make sure before they invest money, they get the most economic design. So, government, is therefore moving the risks of design and the price on the overall toll road infrastructure to Concessionaires.”

Participant 8

“So, for me, it didn't make sense to get the private sector involved throughout the entire process, of course, where government has had experience. Government can decide and say, you know what, we want to design the road ourselves, and share certain risk with the private sector or we want to operate the tolls ourselves. So, I think it is a matter of learning from experience and making sure that each party, meaning the government and the private sector, is able to manage the risk that it has the expertise in. One can argue that SANRAL is a competent client and therefore they can do the design themselves and only invite the private sector to build the road and maintain it. One can also argue that SANRAL is a competent client, they can collect the toll fees on their own, and I think that can also be a different model. But the different model will be determined by the area of expertise and the risk that each party is able to share with the other or on a particular on a particular issue.”

Findings

The responses expressed regarding the adoption of a single model for all three of the toll road concessions varied. Participant 5 indicated that the government was short of funds or finance, hence it invited the private sector to participate in the rollout of toll road infrastructure. In a world where financial resources are always in short supply, one conceivable solution is to include the private sector (particularly its financial and human resources) in the process of public service development and provision (Xu, Chan & Yeung, 2010; Ke, Wang & Chan, 2010; Rausser & Stevens, 2009). This

inclusion of the private sector to provide financial assistance to PPP projects exposes the private sector to financial risk. Maslova and Sokolov (2017:7) describe financial risks as the risk of interest rate changes, inflation risk, the risk of not receiving project funding, the risk of failing to attain financial closure, currency exchange risk, and so on. Participant 5 further expressed that another reason for inviting the private sector to participate in the rollout of toll road infrastructure was the transfer of the design risk. The design risk involves the risk of design flaws, delays in receiving licenses, non-compliance risk of the object with well-defined technical and economic indicators, delayed approvals and permits, etc. (Maslova et al., 2017:7). However, Participant 8 alludes that the public sector should not have given all responsibility for risk to the private sector, emphasising that where the public sector has the capacity to undertake a project's risk should stay within the public sector.

6.3.1.6 Interviews on the role of the government on toll tariffs for the toll roads under examined

The toll tariffs are a critical part of the toll road concessions and the government's role in the determination of toll tariffs is equally important.

a. Findings on the role played by the relevant government departments in determining the toll tariffs for the toll road concessions investigated

The toll roads industry in SA uses the annual CPI adjustment as a price determination for toll fees. In terms of tariff indexation, rather than reflecting actual service costs, tariffs or rates are adjusted or modified on a regular basis to reflect changes in a price index (such as the CPI) (Asian Development Bank, 2008:62). This interview question aimed to understand the role played by the relevant government departments for determining the toll tariffs on the toll roads investigated for this study.

Participant 5

"In terms of the SANRAL and National Roads Act, No. 7 of 1998, there is a provision there about tolling of roads. SANRAL determines the tolls, but the Minister has to approve it. With these three concessions, the toll was set on day one, and they increase it by CPI every year. So, it's fixed in other words, there's no room to increase it or decrease it because it's just a CPI adjustment. Therefore, this is a problem because you must be able to check if they are

making too much money or not, then we must be able to bring the tariffs down or up.”

Findings

According to the above response, the relevant government departments do not play any role in the toll tariff hike because the hike is solely based on the CPI adjustment. However, while the indexation may shield the provider from price hikes that are predictable and are within the normal limitations, the provider remains vulnerable to developments that are beyond the norm or outside of the index (Asian Development Bank, 2008:62). This implies that the CPI adjustment is not the only determinant for toll fee hikes as other mitigating factors, such as service cost, flat rate, dynamic rate, differential rate (e.g., low-income commuters pay less than high-income commuters), pollution and congestion pricing could also impact the toll fee.

6.3.1.7 Interviews on the infrastructure development of the toll road concessions examined

In PPPs, particularly those for toll roads, the infrastructure requires continuous maintenance. Inadequate maintenance raises costs in the long-term while also lowering benefits (IBRD, 2014:45). To avert raising costs due to inadequate maintenance for the toll road concessions, the infrastructure development requires substantial investment from the private sector. Under PPPs, the public sector entrusts the provision of public services, which necessitate significant infrastructure investment and related risks, to the private sector on a long-term basis in order to improve the situation (Ginevičius & Krivka, 2010; Chiara & Garvin, 2008; Wibowo, 2006). In this subsection, the issues related to infrastructure development are discussed.

a. Findings on whether the concessionaires are properly embarking on routine, periodic and emergency works or maintenance on the toll roads examined

Regular toll road maintenance is usually the less expensive option for keeping road infrastructure assets in good working order, as opposed to allowing quality to deteriorate until substantial rehabilitation work is required (IBRD, 2014:45). This interview question aimed to establish whether the concessionaires properly embark

on routine, periodic and emergency works or maintenance on the toll road concessions.

Participant 5

“They are definitely. When you drive along those three toll roads you do not see potholes. They have routine patrols that determine maintenance execution”.

Participant 8

“Absolutely, I think so. I think we have got the best roads in the country and that is a result of a good partnership that is reactive, that makes sure that these road maintenances are implemented properly.”

Findings

Both Participants 5 and 8 agreed that the concessionaires do embark on routine, periodic and emergency works or maintenance on the toll road concessions. They both based their arguments on the assertion that when travelling along the toll road concessions there are no potholes, and that there are routine patrols to determine if maintenance is required. Participant 8 attributed this good maintenance to the public-private partnerships.

b. Findings on whether SANRAL and the concessionaires have invested enough resources in order to service and maintain the ageing infrastructure on the toll roads examined

Common sense dictates that after the completion of any road infrastructure, the resources will be allocated for maintenance going forward. However, previous infrastructure and construction management have mostly concentrated on investment projects (Eriksson, Volker, Kadefors, Lingegård, Larsson & Rosander, 2019; Jobidon, Lemieux & Beauregard, 2018) while the lengthy and costly maintenance phase has been largely ignored (Larsson & Larsson, 2020:2). For this reason, this interview question aimed to ascertain whether SANRAL and the concessionaires invested enough resources in order to service and maintain the ageing infrastructure on the toll roads examined for this study.

Participant 8

“Yes, I think so, in a PPP, the PPP determines at what stage a road would need to be maintained and how often and so on. So, I think it is a very good method of ensuring that ageing infrastructure is actually given the necessary attention that it needs because that is part of the terms and conditions that have been agreed by the two parties as part of signing the PPP agreement.”

Findings

From the above response, it can be deduced that SANRAL and the concessionaires have indeed invested enough resources to be able to service and maintain the ageing infrastructure of the toll roads examined.

6.3.1.8 Interviews on the financial viability of SANRAL to increase the number of toll road concessions in SA

Governments have devised several useful financial mechanisms (such as sovereign guarantees, the public sector comparator (PSC), and the value for money framework) to help them make informed decisions about which PPP projects to pursue and how to entice private partners into those partnerships (IPPPs, 2009:16). However, the abovementioned financial mechanisms will not be useful if the government agency responsible for the PPP project is not financially viable. Therefore, this subsection aimed to determine the financial viability of SANRAL.

a. Findings on the good standing of SANRAL in terms of credit rating to be able to afford the rollout of toll road infrastructure in SA in the immediate future

A revenue-sharing clause or provision and either upfront payments or a stream of payments from the private entity are the conditions under which an entity obtains revenue from the private entity (Accounting Standards Board, 2008:32). Therefore, it is expected that SANRAL's credit rating is in good standing since it generates revenue streams from the toll road concessions investigated, and this interview question sought to determine if SANRAL is indeed in a good state in terms of credit rating.

Participant 8

“No, they are not. Absolutely not. The Gauteng Freeway Improvement Plan has significantly affected SANRAL's ability to raise money for any tolls until the e-tolls issue is sorted. We are unlikely to see SANRAL doing any tolls in the future, and the only roads that SANRAL is doing at the moment are those roads that SANRAL is given the money to actually assist in terms of building roads for provincial and municipalities. But SANRAL is in no good standing credit wise, to actually do any type of toll roads at the moment because of the GFIP not because of the three toll roads under study, because those are actually doing quite well but it is because of the GFIP. There is a 20 billion shortfall debt that was raised. So obviously they need to somehow find the money to pay off that, as well as to find a way of settling with their debtors and their contractors because remember, over and above raising the 20 billion. There is also the contracts that they have entered with the guys who are operating the e-tolls, for example, and so on. So that is a big deal. So, they are not in any good standing to do any type of road infrastructure that is of a toll road in nature any time soon. Unless, of course, there is a resolution on how to go about with the GFIP.”

Findings

The above response suggests that SANRAL is not in good standing in terms of their credit rating, therefore, it cannot afford to engage in the rollout of new toll road infrastructure due to the ramifications of the GFIP. The other difficulty that exacerbated the decline of SANRAL's credit rating is the existence of alternative routes which adversely affects the financial viability of toll road concessions and will ultimately result in SANRAL having to take on greater financial responsibilities (European Commission, 2004:87). From Participant 8's response, SANRAL can obtain a grant loan from the National Treasury through the approval of the Minister of Finance, but specifically for provincial and municipalities roads only and not for toll roads. The next section focuses on the government agency and the concessionaires.

6.3.2 Section B: Findings on the government agency (SOE) and the concessionaires (agents)

SANRAL, as a government agency and SOE, should monitor the activities of the concessionaires (agents) on behalf of the SA government (principal) to ensure that the toll road concessions under study are being properly managed. Characteristics such as unethical behaviour (e.g. corruption or nepotism) are characterised by a principal who delegates power and an agent who wields that power but whose actions cannot be monitored by the principal (Schomaker, 2020:811). To avert unethical behaviour requires stringent monitoring systems, as well as policy, regulatory and legislative frameworks to adequately regulate the PPP sector. The creation of clear PPP policies, as well as the support of a well-designed legislative, regulatory and investment frameworks, are all essential components of an effective PPP (Farquharson, De Mästle & Yescombe, 2011). The subsection below focuses on the policy, regulatory and legislative frameworks for PPPs in SA.

6.3.2.1 Interviews on compliance and implementation to the existing policy, regulatory and legislative frameworks for PPPs

Policy, regulatory and legislative frameworks lay the ground for road infrastructure projects. Governments may develop a regulatory and policy framework to manage access to transport infrastructure as well as how its maintenance and operation are remunerated (Inland Transport Committee (ITC), 2017:30). Therefore, toll road concessions are guided by policy, regulatory and legislative frameworks on issues such as maintenance, operations, finance, construction, etc., and this subsection focuses on regulatory and policy frameworks.

a. Findings on the understanding of the term PPP from the operational point of view

The interview question aimed to clarify and understand the concept of PPPs from the perspective of SANRAL's and the concessionaires' personnel.

Participant 4 (SANRAL)

“You have to understand that PPP in the traditional sense of the word public-private partnership, is a mechanism through which you can finance toll roads’ infrastructure, bring in the private sector and risks accordingly, and be able to

achieve the desired outcome such as the concessionaire delivery of the service or the goods in question or the infrastructure, and then as private sector take some risk and derive some returns that can be used then to fulfil your profit motive.”

“So, it's any transaction where the private sector and the public sector can collaborate allocate risks accordingly with each party best able to bear the risk and then can be able then to implement the project or a service depending on the terms and conditions and the desired objectives of the government.”

Participant 1 (N3TC)

“PPP is a public-private partnership between a private sector entity and a government entity where the private sector provides non-recourse financing for the delivery operations on maintenance of public sector infrastructure for an agreed period of time at an agreed fee. The risks bared by the entity most suitable to take on those risks. I would say guys remember this is a public-private partnership not a public-private battleship to provide the best service for, in our case the road user.”

Participant 3 (TRAC)

“My understanding with reference to PPPs is probably a private partnership with specific structures surrounding that from tax references the PPP partnership is, the private portion is from lenders and banks and public portion of it is the land from the public partner.”

Participant 6 (Bakwena)

“Well, as I said, PPP is a public-private partnership, where we as the private sector, undertake to finance, construct, operate and maintain the roads for the period of the concession and in our case, it is a 30-year concession, and we recover our costs and expenditure and capital investment out of the tolls over that period.”

Finding

From the responses, Participant 4 alludes that the PPP is viewed as a collaboration between the private and public sectors, in which the risk is spread accordingly. Collaboration is described as a complimentary partnership in which organisations work together to produce a result that is more than the sum of the individual inputs (Sanker, 2012; Thomson & Perry, 2006). Furthermore, the above responses show that there is some level of agreement amongst the concessionaires and the agency, that in the PPP arrangement, the most suitable partner takes the risk burden and that the role of the government in this specific PPP arrangement (toll road concessions) is to make land available whereas the role of the concessionaires is to finance, construct, operate and maintain the roads for the period of the concession. The financial portion by concessionaires is from banks and other lenders as contained in the above responses.

b. Findings on whether the regulation and manuals (such as the Public Finance Management Act, Regulation 16 of 1999 and PPP Manual) governing the PPPs for toll road concessions in SA are still sound and adequate

Toll roads play a very pivotal role in South Africa. The quality of infrastructure, particularly for toll roads, affects production costs, job creation, investment and market access (Wasike, 2001). Therefore, the government was prompted to develop the PFMA and PPP Manual in order to bring stability in the sector as a means to achieve the objectives of job creation, investment and market access. This interview question aimed to establish whether the PFMA and PPP Manual are still sound and adequate.

Participant 4

“Actually, the PPP Manual was based on SANRAL's work already as the pioneer of concessions. So, the National Treasury manuals were taken and written a lot in collaboration with SANRAL because it was the only one who have done a lot of great work in this aspect and we were the first ones to launch them.”

Participant 3

“SANRAL is now quite involved on the contract side. If there is a concession agreement, they need to meet certain KPIs if you can say it like that in terms of time lines, not always but it is been met with handing over of agreements and proving of designs and all of that.”

Participant 6

“Well, I think they're very sound because in actual fact, all three concessions are still running after a while, and ours have been running almost 20 years, the other two have been running for slightly longer so I think they've been very successful.”

Findings

According to the responses above, Participant 4 posits that during the drafting of the PPP Manual, the National Treasury used the PPP arrangement between the toll road concessionaires and SANRAL as its foundation since there were no other PPP arrangements at the time. Therefore, this participant considers the Public Finance Management Act, Regulation 16 of 1999 and PPP Manual, as still sound and adequate because they were tailor-made for toll road concessions. According to the response from Participant 6, all three concessions are still in operation after running for a while due to their adherence to the Public Finance Management Act, Regulation 16 of 1999 and PPP Manuals governing PPPs in South Africa. Therefore, the responses suggest that the PFMA and PPP Manual are still sound and adequate. Participant 3 added that SANRAL is now highly involved in the enforcement of the PFMA and PPP Manual, however, the timelines are not always met and this leads to delays. One of the most common challenges in the construction sector is a delay in the delivery of construction projects (Al-Kharashi & Skitmore, 2009). Solís-Carcaño, Corona-Suárez and García-Ibarra (2015:1) posit that delaying the project will make it more difficult to achieve the anticipated project revenue and raises financial costs. By delaying or not meeting the timelines, the concessionaires risk the possibility of compromising the toll road infrastructure and reneging on service-level agreements.

c. *Findings on whether SANRAL performs its functions in accordance with the SANRAL and National Roads Act, No. 7 of 1998, in terms of managing and controlling toll roads in SA*

According to agency theory, executives (for example executives of government agency) may act opportunistically, undermining political principals' (Bjurstrøm, 2020:1054). Acting opportunistically by SANRAL executives (government agency) could result in the under-performance and under-achievement of its mandate and this could prompt politicians to take the appropriate action in order to correct the situation. Political leaders could utilise performance management to control and monitor the executives in such instances (Bjurstrøm, 2020:1054). Therefore, this question aimed to determine if SANRAL performs its role of managing and controlling toll roads in SA in accordance with the SANRAL and National Roads Act, No. 7 of 1998.

Participant 4

“SANRAL has two portfolio (namely a non-toll portfolio and a toll portfolio) and in terms of toll portfolio, SANRAL puts out attractive projects to the private sector in order to enable the private sector to bid on. Therefore, this empowers SANRAL in terms of the SANRAL and National Roads Act, No. 7 of 1998.”

Participant 1

“I absolutely think so, all three concessions are governed by a concession contract and various annexures to the concession contract. These have engineering standards, environmental requirements and things like that, and in terms of the concession contract, you have to maintain certain standards and provide the road user with a certain service and we are being monitored by SANRAL almost on a daily basis but it is not that bad.”

“They do this continuously, and what the concession contract also allows for is what is called independent engineer, and that engineer is appointed by ourselves and SANRAL on a 50/50 cost-baring basis and his or her function is to ensure that both entities comply with their obligations in terms of the concession template.”

Participant 6

“Well, yes, I think they are adhering to it (SANRAL), and in actual fact, I think if you go back into it, you'll probably find that what they're doing for toll roads, they actually drafted it and put it together and they made it as robust as it is that they've been able to stand the test of time.”

Findings

In terms of the responses, it seems as if SANRAL does indeed manage and control the toll roads in SA in accordance with the SANRAL and National Roads Act, No. 7 of 1998. With regard to its adherence to the Act, it appears as if SANRAL ensures that all three of the concessionaires examined for this study comply with engineering standards and environmental requirements as prescribed in the concession contract. Participant 1 further indicates that in ensuring the compliance to the SANRAL and National Roads Act, No. 7 of 1998, an independent engineer is appointed and paid on a 50/50 basis by SANRAL and the individual concessionaires. Greiner and Metzger (1983:7) characterise independent engineering as an advisory service contracted for and provided to organisations by specially trained and qualified persons who assist the client organisation in identifying management problems, analysing such problems, recommending solutions to these problems, and when requested, assist in the implementation of solutions in an objective and independent manner. The appointment of an independent engineer reflects the commitment to achieving fair, honest, independent and credible reports on toll road infrastructure related issues, and this should continue to be encouraged.

In relation to SANRAL's response, Participant 4 outlines two main actions (in a form of two portfolios) that SANRAL performs in accordance with the SANRAL and National Roads Act, No. 7 of 1998, in terms of managing and controlling toll roads in SA. In detailing the toll portfolio (which is relevant to this study), Participant 4 alludes that SANRAL puts out attractive projects for the private sector to bid on, and after this process has been completed, SANRAL then monitors the activities of the appointed concessionaires. The project monitoring ensures that everything goes according to plan (Adebayo et al., 2018:177) and according to Jack, Okeke, Okechukwu and

Akinola (2016), monitoring identifies inconsistencies, manages change and provides feedback in order to update and gradually elaborate the plan.

d. *Findings on whether the concessionaires adhere to the National Environment Management Act, No. 107 of 1998, and its sub-acts on toll road concessions*

South Africa has opted to engage in a massive infrastructure construction drive (which includes the toll road concessions examined) as a means of unlocking economic benefits. However, this massive infrastructure construction has adverse environmental consequences (Siswoyo, 2020:152). For this reason, this interview question aimed to determine whether the concessionaires adhere to the National Environment Management Act, No. 107 of 1998 (NEMA) and its sub-acts.

Participant 1

“Then there are other Acts, for example, the Environmental Management Act all those things, everything that has impact on our projects, we comply with, in fact, we actually have processes in place that ensure that if there are any changes to any Act that has or could have an impact on our concession contracts that we are aware of and we can deal with it appropriately. Certainly, in the history of our firm, we have never been found to be non-compliant as far as our concession contract is concerned nor any legislative requirement.”

Findings

Based on the response, Participant 1 admits that their concessionaire adheres to the National Environment Management Act, No. 107 of 1998, and further alludes that their concessionaire has measures in place to deal with any amendments to any Act that may affect the concession. As a result, for the sake of present and future generations, every toll road development must be founded on the optimal use of available resources while carefully ensuring environmental sustainability (Siswoyo, 2020:153). In maintaining environmental sustainability in the toll road space, in Stockholm, the congestion fee was renamed to an environmental charge to stress the positive impact on air quality and to link it to a strong attitude towards the local and global environment (Eliasson, 2014).

e. Findings on whether the concessionaires comply with the Cross-Border Road Transport Act, No. 4 of 1998

The N4 motorway connects South Africa's economic heartland (Gauteng Province) to the port in Maputo, Mozambique (Bull, Mauchan & Wilson, 2018:39). However, due to the COVID-19 pandemic, the N4 and N1N4 cross-border posts had to be closed in 2020 because SA government declared a level five state of disaster. To combat the spread of COVID-19, many countries around the world have imposed domestic transit restrictions and/or closed border crossings for road freight transport services (Arab Trade Union Confederation (ATUC), 2020:29). As a result, this interview question aimed to determine whether the relevant concessionaires comply with the Cross-Border Road Transport Act, No. 4 of 1998.

Participant 3

“In terms of cross-border just the legal portion of it there is always some issues. We are not running the same legal processes between South Africa and Mozambique, luckily for traffic management and so on, there are standard regulations that we must comply with and enforce for concessions, but for instance load control, between the two countries we have different types of regime and load control manifests than what the people of Mozambique have or Mozambique government rather.”

Findings

Based on the above response, the concessionaire finds itself having to grapple with issues at all times in relation to the Cross-Border Road Transport Act, No. 4 of 1998. According to the above excerpt, the situation was worsened by the fact that the concessionaire must comply with two different cross-border legislations, one for each of the two countries (South Africa and Mozambique), and one example cited was that of load control since both countries have different types of regulation governing the issue. An axle-load control system was installed along the highway corridor to solve the N4's higher-than-expected damage caused by trucks over-loading (Bull et al., 2018:39). In addressing some of the requirements of this PPP arrangement, the other country had to step in and take more responsibility. The funding challenges posed by

the two-countries were overcome by relying on the South African market as a source of revenue (Bull et al., 2018:39).

f. Findings on the measures that the concessionaires take in order to comply with the Spatial Planning and Land Use Management Act, No. 16 of 2013, with regard to land development (toll road construction)

Artificial surfaces laid on the land have adverse environmental consequences. Land degradation is one of the most important aspects of global environmental change posing a major threat to natural resources (Magliocca, Rudel, Verburg, McConnell, Mertz, Gerstner, Heinimann & Ellis, 2015). Land deterioration due to the proliferation of artificial surfaces as a result of diverse economic activities such as housing, industry and transportation infrastructure, also known as soil sealing, is one of the most intensive forms of land degradation in urban areas (Oliveira, Tobias & Hersperger, 2018:2). Appropriate land-use management strategies as well as effective spatial planning procedures are required to halt and reverse land degradation. With this in mind, this interview question aimed to determine what measures the concessionaires take to comply with the Spatial Planning and Land Use Management Act, No. 16 of 2013.

Participant 6

“Our contract was finalised before the Act came into being, but all the regulations proclaiming the route and stuff had to be done by SANRAL property acquisition. SANRAL and the DoT had the requirement of acquiring the road reserves and everything is well and that obviously had to be done in terms of the spatial planning requirements.”

Findings

The above response admits that the above concessionaire does not get involved with compliance to the Spatial Planning and Land Use Management Act, No.16 of 2013 (SPLUMA), with regard to land development (toll roads construction) because of all the regulations proclaiming the route had to be done by SANRAL property acquisition. However, data suggests that South Africa has limited water resources, and that a lack of knowledge of the impact of land-use decisions taken by spatial planners has harmed the country's already low water supplies (Rohr, Cilliers & Fourie, 2017:13).

Irrespective of the SPLUMA being enacted after the finalisation of the above concession, it is the responsibility of the above concessionaire to familiarise itself with the contents of the SPLUMA, especially Section 25(1)(c) and (d).

g. Findings on whether the concessionaires comply with the National Land Transport Act, No. 8 of 2009, and its impact on the concessionaires

According to Stanway (2001:1), the National Land Transport Transition Act, No. 22 of 2000 (NLTTA), is based on a shift from a supply-driven to a demand-driven or needs-driven land transport system which is expressed through transport plans. This Act is proactive in the sense that it took a supply driven approach rather than acting after the demand had been made, and with this approach a behavioural change from road users, concessionaires and SANRAL can be expected. First, the NLTTA must be able to change transportation behaviour, second, it must ensure that transportation infrastructure does not completely influence land use, and third, it must have a significant and positive impact on land use (Knaap & Song, 2004:3). Therefore, this interview question aimed to determine whether the concessionaires comply with the National Land Transport Act, No. 8 of 2009.

Participant 1

“Yes, let me stress, we already have a company that monitors all legislation and internal controls that looks at any changes to see how will that impact us and what we have to do, whether we have changed some aspects, like right now we have COVID.”

Findings

The above response stresses that the above concessionaire does indeed comply with the National Land Transport Act, No. 8 of 2009, because they contracted a company that monitors all legislation and internal controls on their behalf. Participant 1 further alludes that they have the capability of readjusting their systems accordingly and cited the COVID-19 pandemic as an example. The impact of the COVID-19 pandemic on the transport industry has been severe, and both freight and passenger transport have suffered significant setbacks as a result of the crisis (Tardivo, Zanuy & Martin, 2021:369).

h. Findings on the challenges for the policy and legislation that govern toll road concessions in SA

This interview question explored the challenges experienced by SANRAL and the concessionaires in terms of policy and legislation.

Participant 1

“The discomfort that users experience in Gauteng section freeway project, sometimes it washes or spills over to the other toll roads. People are saying if we do not pay in the Gauteng one, why we must pay in the N3, N1N4 and N4. So, it is just that indecisiveness that causes the potential for people being unhappy about toll roads in general.”

“Although, we have very few complains with regards to our toll roads and even our toll prices, our traction rates in the corridor, we attract anything from 95% upwards of the traffic in the corridor, so that tells you that the user is happy to pay for the service that he or she is getting while driving on the toll road, and this justifies that there are not much concessions policy or legislation problems with regard to our concession.”

Findings

According to the above response, one of the challenges for the policy and legislation that govern toll road concessions in SA is policy indecisiveness, more particularly for the Gauteng Freeway Improvement Plan toll road (GFIP) because of its potential to affect all three of the toll road concessions investigated. Residents of Gauteng, businesses, trade unions, civil society organisations, a few opposition party lawmakers and top government officials have all expressed significant opposition to the GFIP (Naidoo, 2013:108). This opposition or resistance was borne out of a lack of a thorough public consultation process by SANRAL and the government. Public consultation can be used as a regulatory instrument to increase a regulation's transparency and effectiveness (Holland, 2002:76). As a result, the general public was not consulted during the planning of this road network (GFIP), with the lack of government consultation most evident when motorists and other stakeholders declined to register for the GFIP e-toll system (Matsiliza, 2016:5).

The respondent further identified the increase in traffic volumes as a justification for there not being many policy or legislation problems with regard to their concession. It is critically important for the DoT and the National Treasury to urgently make a decision regarding the GFIP in order to eliminate policy uncertainty in the toll road concession space.

i. Findings on whether the concessionaires are fulfilling their part of the contractual agreement for the toll roads under examination

It is in the best interest of the concessionaires to honour the terms and conditions of the PPP contractual agreements that they have entered into with SANRAL. Contractual agreements define the form of partnership in legal terms and they facilitate the interaction between individuals with knowledge, skills, and/or resources in order to create something new, enhance what currently exists or dispense what has already been created (Gold & Bubela, 2007:725). The purpose of the contract is to formalise an agreement into a legal document (Hoffner & Field, 2005:2). As a consequence, this interview question attempted to ascertain whether the concessionaires are fulfilling their part of the contractual agreement on the toll roads examined.

Participant 4

“Yes, we have an understanding with every concessionaire that the public sector is required to also conduct oversight. We do have forums where we meet the concessionaires in order to hold them to account against the concession contract if necessary. You can impose penalties the concession contract does allow for that. But in actual fact, you do have minimum standards that need to be complied with on the concessionaires' part.”

“So, the issue is then at the start of the concession contract or when you are doing the preparations. You must just be clear in terms of what to expect from the concessionaire, the quality of the infrastructure, how it must be maintained, the levels of service in terms of traffic, and making sure that there is mobility on the road, safety standards are in place. Triggers are there for example when they need to do upgrades and that's all laid out in terms of your pavement strategy and your traffic accommodations and with your traffic road strategy, so that is all in place.”

“Okay, so we have one very good relation with our three concessionaires they are keeping to the contract and there are mechanisms in place to always enforce the contract with any contract.”

Findings

The above response indicates that SANRAL is of the view that the concessionaires are fulfilling their part of the contractual agreement. Based on the response, SANRAL conducts oversight and participates in various forums to ensure that the concessionaires comply with the terms of their contractual agreements. Oversight entails monitoring the work of the concessionaires in a quest to enhance service delivery and to achieve improved road conditions for road users (Kraai, Holtzhausen & Malan, 2017:63). Another critical issue mentioned is that, at the beginning of the concession contract, SANRAL clearly outlines the expectations for the infrastructure quality of toll roads and this makes it easy for the concessionaires to comply as there is less scope for ambiguity, which in turn, improves the relations between the partners.

6.3.2.2 Interviews on the infrastructure development for the toll road concessions examined

Traditionally, the performance of infrastructure projects is assessed in terms of meeting the project's timeline, scope, quality and cost objectives (Khan, Hussain, Waris, Ismail & Ilyas, 2018:121). The objectives cited above are not sufficient to measure or assess or evaluate the performance of infrastructure projects. The contemporary project evaluation, measurement or assessment are increasingly being expanded to encompass governance and the ability to achieve better outcomes and the intended performance (Khan et al., 2018:121). For this reason, this subsection concentrated on the different infrastructure activities that the concessionaires perform on the toll road concessions examined for this study.

a. Findings on whether the concessionaires are properly embarking on routine, periodic and emergency maintenance on the toll road concessions investigated

Road maintenance is an ongoing process that requires qualified workers, financial capacity, resources and time. Road maintenance is done on a continuous basis with proper planning and finance and the right form of road maintenance is required to

combat the decline in a road's condition (Suwanto, Kurnianto, Setiabudi & Sholeh, 2021:1). As a consequence, this interview question aimed to probe whether routine, periodic and emergency maintenance is conducted on the toll road concessions investigated.

Participant 4

“Yes, as I indicated to you, the regional office under which the concession resides, in terms of managing the engineering activities, it does hold meetings with concessionaires and conducts regular checks. There is an understanding between SANRAL and concessionaires that regular maintenance is done.”

“SANRAL teams and an independent engineer are making sure that the road networks are maintained as per the standards outlined in the concession agreement.”

Participant 1

“We are very committed and very dedicated in ensuring that the public gets value for money when they travel on our roads, and if there is a pothole it will be fixed within 24 hours. We agreed on a three-year rolling program with SANRAL and that is based on our pavement management system, which tells us what we have to do with the road and when do we have to do it.”

Participant 3

“Between the three concessions in terms of maintenance, we are the only one that actually do maintenance in-house, therefore, we have a full maintenance department. In terms of maintenance, there is a periodic maintenance, so all the road potholes repairs, line marking, road sign repairs, clearing of drains, grass cutting and all of that, that we are doing and that is part of our agreement and that what the toll tariffs are covering.”

Findings

From the above responses, it could be interpreted that the concessionaires do embark on routine, periodic and emergency works or maintenance on their toll roads in order for the motorists to enjoy good quality driving conditions. Road maintenance is required on toll roads to ensure the smoothness, comfort and safety of traffic for toll road users (Suwanto et al., 2021:1). Participant 3 reported that they do have a full in-house maintenance department with a specialised team and that they are the only concessionaire in the country with such a department within the toll road concession sector. Furthermore, the private party is responsible for utilising specialised labour and high-quality construction materials to reduce maintenance expenses, whereas in traditional procurement, the contractor is only liable for damages within the warranty period (Yescombe, 2007). Participant 1 mentioned that they have a three-year rolling program with SANRAL that focuses on a system for pavement management.

Additionally, according to Participant 4, the concessionaires do embark on routine, periodic and emergency works or maintenance on the toll roads investigated. The first move in obtaining funding for road maintenance is to look to road users to pay for the cost of maintenance and the road users can either pay directly (through tolling) or indirectly (through fuel taxes) (Queiroz et al., 2016:7). Participant 4 further alludes that the relevant SANRAL regional offices conduct checks and balances on toll road infrastructure on a regular basis and that an independent engineer is used to source an impartial view regarding the state of infrastructure for the toll roads.

b. Findings on whether SANRAL and the concessionaires have invested enough resources in order to service or maintain the ageing infrastructure on toll roads investigated

The budget constraints on the part of the government makes it harder for the government to maintain the existing road infrastructure. PPPs are being used to build express lanes or toll roads to successfully manage new or existing road infrastructure (Mathew & Pulugurtha, 2019:3). When maintenance of the existing road infrastructure is not properly done, corrosion of bridges on toll road concessions may go undetected or unnoticed, resulting in catastrophic failure and loss of life (Al-Ostaz, Cheng, Mullen & Song, 2009:2). Therefore, this interview question aimed to determine whether maintenance of the ageing infrastructure is being performed by the concessionaires.

Participant 4

“Yes, remember, by the time we open the bidding process, the bidders submit their offers to SANRAL, which contained their Financial Models. They submit their scope of works in terms of engineering and payment strategy. They will indicate when they will do periodic routine and maintenance in their plans as required, and they will also indicate when they need to do major works, then share these plans with not just the independent engineer but also with SANRAL.”

“Lastly, they will discuss these plans in terms of the designs in order to accommodate the growth in traffic of the road networks.”

Participant 1

“Again, the answer is yes. It comes back to the pavement management system, and our battle is that at the end of the concession period, SANRAL specifies that you must hand in a toll road with a certain remaining life. This is made difficult by the fact that every truck does certain damage to the road and it consumes the road, it consumes the remaining life.”

Participant 3

“Yes, we do. We have our financial model structured in such a way that we have to rehabilitate a portion of our toll road every seven to eight years, so we made more than enough provision for that. In terms of age our bridge structures are repaired on a five-year basis, every five years we inspect problems on our bridges and put out separate contracts that get serviced in another five years period, and for road signs and all of that we cater for on an annual basis.”

Participant 6

“Well, yes, and SANRAL has got some fully stringent requirements there in terms of what we hand back.”

Findings

Based on the above responses, Participant 4 posits that SANRAL has ensured that the concessionaires are investing enough in terms of finance and other resources to be able to service or maintain the ageing infrastructure on the toll roads investigated. According to Participant 4, the process of assessing and determining the capacity of the concessionaires to rollout infrastructure and then maintain it regarding the toll roads, starts early during the bidding stage when their financial models are presented to SANRAL. As a result, effective financial model considerations identify uncontrollable risks during the initial stage of the cost estimating phase and substantially improve the chances of reducing any mistakes during the construction phase (Doloi, 2013:267). According to Baloi and Price (2003), cost estimating is a technical procedure for anticipating expenditure and its success is dependent on the precise integration of resources, project information and project control.

All three participants representing the concessionaires indicated that they are servicing and maintaining the ageing infrastructure on their toll road concessions. They also expressed that part of the servicing or maintaining of the ageing infrastructure is due to SANRAL's expectation of receiving a well-maintained toll road infrastructure at the end of the PPP contract. To achieve well-maintained toll road infrastructure, the concessionaires follow a strict maintenance plan as indicated by the responses.

c. Findings on the weaknesses and strengths that the concessionaires experience in terms of infrastructure development

This question aimed to ascertain any weaknesses and strengths that the concessionaires experience in terms of infrastructure development.

Participant 1

“In terms of the strengths I think we have already mentioned them over and over. In all fairness I cannot think of any weaknesses we are experiencing, I honestly think it is not because I was with government at the time but this whole PPP model, they got it right in the road sector.”

“However, the only weakness is probably the law enforcement issue, and due to lack of law enforcement you are exposed to overloaded trucks you know. This consumes your highway at a rate you did not account for, and secondly it causes an immense amount of safety hazards, and for example, we have 34% trucks that are involved in 54% of the accidents.”

Participant 3

“I might say in terms of infrastructure development, weakness is from the government side you know, assisting us with construction markers. Municipalities and metros are informed when we start any work.

We have a lot of standing time on our projects, people coming and intimidating contractors, and they toy-toying with our people by coming and intimidating them.”

Participant 6

“Who would have envisaged the resistance of the e-tolling because that is hurting us a bit. We had e-tags since 2002, 13 years before SANRAL introduced e-tags and now we suddenly experiencing the resistance because at Gauteng Freeway Improvement Project (GFIP), we are finding that people don’t want to get them (e-tags) anymore. E-tags make it easier to go through the toll plazas.”

Findings

The above responses highlight a lack of dedicated traffic police on toll roads concessions as a serious weakness because it is seen as an important measure for enforcing the law on toll road concessions due to an increase in the damaging of the infrastructure (i.e. overloaded trucks), other traffic transgressions and public protests (i.e. intimidation, closing of roads, burning of trucks and vehicles, etc.). Enforcement focuses on traffic violations in order to capture reckless drivers in the act and generate a deterrent effect among the general public (Cordner, 2020:35). Another weakness mentioned is the resistance to the Gauteng Freeway Improvement Project, which effects have spilled-over into the toll road concessions under discussion because motorists no longer want to get e-tags, and prior to the introduction of GFIP motorists

never had a problem with e-tags. The widespread public opposition to the GFIP system, as well as civic organisations' co-ordinated efforts to have it cancelled entirely, demonstrates a lack of psychological buy-in from motorists (Khatleli, Venter, Ntene & Ntimba, 2016:1).

6.3.2.3 Interviews on the background behind the adoption of the DCFOM model

The needs and requirements of the country shape the PPP model to be adopted. Most emerging economies have massive infrastructure deficits and high government debts, making a PPP an even more attractive option for boosting infrastructure development in these countries (Robert, Dansoh & Kuragu, 2014:2). However, developed countries have high infrastructure growth and they may have varied reasons to adopt PPP models as to those of developing countries. The United Kingdom's reasons for adopting PPPs, is for greater public benefit, better project technology and economy and public sector avoidance of regulatory and financial constraints (Li, Akintoye, Edwards & Hardcastle, 2005). New Zealand adopted PPPs for the life cycle cost savings and better risk allocation (Liu & Wilkinson, 2011).

a. Findings on the evidence-based technical expertise and political influence in the selection of the DCFOM model for the three toll road concessions examined

Most of the toll roads analysed had an advocate, often a political champion, who advocated for the road's construction for decades (Prozzi, Flanagan, Loftus-Otway, Porterfield, Persad, Prozzi & Walton, 2009:135). With regard to the toll road concessions examined, this question aimed to determine whether political influence or technical expertise played any role in the selection of the DCFOM model.

Participant 1

"I think as far as that is concerned, the only political influence that took part or that was there at the time is that politically, the development of PPPs in the road sector was supported. So, the government stood behind SANRAL and also the Minister of Transport at the time. They (government and Minister of Transport) said we are happy to stand behind SANRAL in the development of PPPs in the toll road arena. So, that was the only political influence, I do not even want to

call it influence, it was government buy in, into involving the private sector in infrastructure delivery.

In terms of awarding and evaluation, as far as I know, there was no political influence.”

Participant 3

“I think definitely technical expertise, look it is a 50/50 I must say, you can have a lot of technical expertise, but you need to have political influence for it to go. If you do not have political influence or political buy in in any PPP project, then it is not going to get off the ground. So, definitely a 50/50 I would say, usually what we see is that there is usually a little bit of a buy off and things in the background that require political influence, so it is definitely a 50/50.”

Participant 6

“I think that SANRAL, DoT and the Minister of the day were very supportive of the DCFOM model, and all three of them (concessions) went through well. I think there may have been some problems subsequent to that, because I'm aware of at least two toll road projects that didn't happen, primarily because they didn't have the political support that they needed.

In terms of answering your question, I think that the political influence is probably more as the promoter of constructing the toll road.”

Findings

From the above responses, all of the participants agree that there was a political influence with the intent to support the successful implementation of PPPs in the road subsector and also in supporting the adoption of the DCFOM model. They viewed political influence as a necessary feature of a PPP in general because without political buy in these three concessions would have not been realised. Many toll roads would not have been constructed if it had not been for the political figures (Prozzi et al., 2009:135). The participants also emphasised the importance of technical expertise since it assists in accurately identifying and determining the appropriate PPP model based on the practitioners' experience, expertise and empirical research.

b. Findings on the strengths and weaknesses of the DCFOM model in relation to the toll road concessions under examination

The DCFOM model has both strengths and weaknesses. Prieto (2012:5) alludes that the owner's decisions and reviews are more restricted in the DCFOM model, while on the other hand, the owner has no exposure to errors and omissions. In the context of the toll road concessions examined, this interview question aimed to ascertain the strengths and weaknesses of the DCFOM model.

Participant 4

“The model is the model, there are various models you can choose, so there is nothing wrong with the model. It just depends on the people that are applying it and how you've covered your bases. So, the DCFOM model works for SANRAL at the moment, and it is a very good model. It also fits the conditions of the asset and infrastructure.”

Participant 1

“What SANRAL did at the time, they went around the world and observe where concessions were implemented, where there have been successes and where has there been failures. So, they looked at why there were successes and why there were failures, and quite often, the biggest failure of a concession project, or the most has to do with traffic engineers overestimating the traffic. So, you have this massive revenue stream that would have secured for all your debt, you then open the toll road and find 30% of the traffic missing and you are sitting with 70% of the revenue you expected and all of a sudden the debt cannot be repaid.”

Participant 6

“The funding is not available as soon as the contract is laid and that it was our concessionaire's challenge to find that funding and get the banks to bankroll it. It was one of the challenges at the start of our project.”

Findings

The above responses show that SANRAL is satisfied with the DCFOM model and does not experience any serious weaknesses with this model. However, the above responses from the concessionaires indicate that some of the weaknesses are around the traffic overestimation made by engineers and this leads to the debt not being serviced appropriately due to missing traffic volumes that then amount to dwindling revenues. These revenue-related risks typically reflect uncertainties in future traffic volumes and road users' willingness to pay tolls, as well as the likelihood that planned land-use patterns do not materialise (Queiroz, Uribe & Blumenfeld, 2016:27; Lemp and Kockelman, 2009:2). The accuracy of traffic forecasts incorporating large samples is infrequent or rare (Welde, Tveter & Odeck, 2020:66). According to the above responses, another weakness is the late availability of funding at the beginning of the toll road project which has adverse consequences later during the running of the contract.

c. Findings on which differentiated/individualised model would the concessionaires prefer for their concessions

This interview question aimed to establish which individualised models the concessionaires would prefer for their concessions since all three of the toll road concessions examined use one single model.

Participant 4

"We've always stuck with BOT as SANRAL which is the same as DCFOM. There's no one-size-fits-all. There's no optimal model so you can do a situation-analysis whereby you're just craft annuity payments to the operator or the private sector in return for certain service levels or internal turn for certain works, etc."

Participant 1

"I do not know, but our model is what we call design, construct, finance, operate and maintain (DCFOM). I think that is a fair model, the DCFOM. As I said we all use non-recourse funding or financing, so the lenders rely on revenue that we repay them because they cannot go after the equity investors, in our case."

Participant 6

“Yes, the current model is one size fits all. However, SANRAL tighten up things differently for each toll concession under study.”

Findings

There is an acknowledgement from the above responses (SANRAL) that there is no optimal model and no one-size-fits-all approach with regard to PPP models. However, SANRAL has stuck with the BOT model for all three concessions under examination which according to the above responses, is the same as the DCFOM model. According to the responses, the concessionaires are contending with the toll road model they are currently using although a differentiated approach in terms of modelling is not exercised. The justification for the model being used, as provided by Participant 6, is that SANRAL is able to apply different contractual terms for each concessionaire using a singular model approach and this suits the individual concessionaires. Another justification, as provided by Participant 1, is that the model under discussion protects the equity investors from the lenders since the repayment of the debt depends on the revenue generated from toll collections and the lenders agreed to non-recourse financing. In non-recourse financing, the lender has no recourse against the parent organisation or borrowing SPV even if the project fails (Merna, 2010; Gatti, 2008). Non-recourse debt, on the other hand, has the disadvantage of exposing lenders to project-specific risks that are difficult to diversify (Sorge, 2004:96). Therefore, the next section concentrates on businesses and lobby groups.

6.3.3 Section C: Business, Civil Society Groups and Trade Unions

An important function of a PPP is to present value to the public and achieving the correct amount of public participation in the PPP process can make or break a PPP, as well as contribute directly to good governance (International Bank for Reconstruction and Development, 2014:114). For this reason, this section focuses on whether the public, workers and businesses receive value from the toll roads examined and whether they participated in these PPP projects. In the context of this research study, the business sector was represented by the Road Freight Association (RFA), the workers were represented by South African Federation of Trade Unions (SAFTU), and the civil society groups were represented by the Organisation Undoing

Tax Abuse (OUTA). Most importantly, the responses of the RFA and OUTA will be assessed and evaluated against those in Section A (Government Departments) and Section B (Government Agency and Concessionaires (Agents)). This approach will assist in verifying that what has been said by the government departments, government agency and the concessionaires is accurate or not.

6.3.3.1 Interviews on Corporate Social Investment

This subsection seeks to establish the role played by SANRAL and the concessionaires in the development of local businesses and communities which are along the toll road concessions investigated for this study.

a. *Findings on whether SANRAL and the concessionaires are fulfilling their developmental mandate appropriately and adequately by reaching out to business and communities*

SANRAL, as a SOE, is mandated to fulfil several roles in the developmental state. One of these roles is to invest in economic infrastructure on the behalf of the government, e.g. expanding and maintaining road networks in SA (Jahed, Muller, Amra & Jantjies, 2015:3). However, in some instances, SANRAL is bound to enter into partnerships with the private sector in order to fulfil its developmental mandate. Therefore, this interview question aimed to ascertain whether SANRAL and the concessionaires are appropriately and adequately reaching out to businesses and communities in fulfilling this developmental mandate.

Participant 11 (RFA)

“Ok, I mean, we get a fair amount of information from SANRAL and Concessionaires, they communicate quite a lot with us. When they look into expanding their network or maintaining their network or looking for different routes, they chat to us frequently and involve us in as much. We have very good relations with all three concessionaires, namely Bakwena, TRAC and N3TC.”

Participant 12 (SAFTU)

“No, I don't think they are fulfilling their developmental mandate. In our view, the purpose of SANRAL is to actually create a conducive environment for economy to thrive, it is actually a business orientated rather than developmental orientated.”

Findings

According to the above responses, there is a difference of opinion on whether SANRAL and the concessionaires are reaching out to businesses and workers. Participant 11 concurs that SANRAL and the concessionaires are reaching out appropriately and adequately to businesses and workers, however, Participant 12 claims that they are not. According to one response, when SANRAL and the concessionaires expand and maintain road networks as part of their developmental mandate, businesses, workers and communities are invited to participate. Yet, another response is that SANRAL is not delivering on its developmental mandate but is rather more business inclined.

b. Findings on whether SANRAL and the concessionaires source material from local suppliers (during the construction and maintenance of the toll road under investigation)

Although the number of small-, medium- and micro-enterprises (SMMEs) participating in these projects increased by 21% to 201 entities in 2018/19, and the training of workers had expanded, the economic benefits to local companies and residents declined (SANRAL, 2019:73). In this interview question, the researcher aimed to establish whether SANRAL and the concessionaires source their material from local suppliers during the construction and maintenance of the toll roads under investigation as a means of contributing to the local economic development.

Participant 7 (OUTA)

“Yes, and my understanding is that they are doing that.”

Participant 11

“SANRAL comes to us and asks us whether we would have lists or contacts of communities or smaller companies (start-up companies) in various areas to assist them.”

Participant 12

“Yes, but is purchasing 60 percent of them from foreign countries.”

Findings

There is an agreement amongst the participants that SANRAL and the concessionaires source materials from local suppliers during the construction and maintenance of the toll roads investigated. However, one of the responses alludes that 60% of materials used by SANRAL and the concessionaires are sourced from overseas. Traditional supplier firms, on the other hand, are located in developed nations and have the potential and capacity to keep up with rapid construction changes (Ju, 2012; Ahuja & Khamba, 2008). Therefore, the local suppliers must keep up with the standards set by these traditional supply firms located in developed nations. However, SANRAL and the concessionaires are required by law to make a special provision for local suppliers.

c. Findings on whether SANRAL and the concessionaires transfer knowledge and skills to the local population during the construction and maintenance of the toll roads under investigation

The transfer of knowledge and skills to the local population in the construction industry go a long way to improving the livelihoods of recipients. Knowledge sharing, also known as knowledge transfer, refers to the exchange, transfer and application of skills and knowledge among project stakeholders (Seriki, 2020:46). As a consequence, this interview question attempted to establish whether SANRAL and the concessionaires are actively involved in transferring knowledge and skills to the local population during the construction and maintenance of the toll roads under investigation.

Participant 7

“I think largely they do, but they can do more, they could do better.”

Participant 11

“That's a difficult one, because I'm not part of that process, either. But what I do know in some of the discussions we've had is that they do employ along the routes, people from local communities to do maintenance on the roads. “

Participant 12:

“They do, I think one needs to also appreciate the attempt to at least reduce the number of unemployment. So as a union, we welcome that, however, what we are actually advocating for, is that we want to see a government creating more employment in the toll road.”

Findings

The participants agree that both SANRAL and the concessionaires transfer knowledge and skills to the local population during the construction and maintenance of the toll road concessions investigated for this study. The transfer of knowledge and skills necessitates regular and extensive interaction between the source and the recipient (McDermott & Corredoira, 2010).

d. Findings on whether SANRAL and the concessionaires inform the community and business sector of activities prior to implementation of maintenance along the toll road concessions investigated

This interview question aimed to determine whether SANRAL and the concessionaires alert the community and business sector in time before any maintenance activities take place along the toll road concessions investigated.

Participant 7

“No, not always, not enough, and yet I base my view on the whole e-toll debacle, that was an absolute sham that did not engage the community, in fact, at all.”

Participant 11

“Definitely, they let us know.”

Participant 12

“On the e-toll stories they failed to inform all the communities, the majority of our people only learned about them through newspapers, through media. But there has never been a process where SANRAL would go to every town or particularly in the hotel where they've erected those, to hear the views, sort of public participation. So, it is actually minimal to say that the SANRAL and the concessionaires informed the community and workers of activities prior to the implementation.”

Findings

There is a disagreement amongst participants as to whether SANRAL and the concessionaires inform the community and business sector of maintenance activities prior to their implementation along the toll road concessions. The public agency and the concessionaries responsible for maintaining road infrastructure assets routinely fail to consider the impact that infrastructure assets have on the public and businesses by not engaging with them (Hietbrink, Hartmann & Dewulf, 2012:267).

6.3.3.2 Interviews on toll tariffs

It is necessary to state types of toll tariffs/pricing in the beginning of this subsection. The types of toll tariffs/pricing according to Higgins, Bhatt and Mahendra (2010:4), are as follows: HOT lanes (variable-priced HOV lanes), traditional toll roads (usually a flat or distance-based fee), express toll lanes (lanes separated from main lanes and variably priced), cordon pricing, per-household highway access fee and a mileage fee. Toll tariffs are extensively discussed in this subsection.

a. Findings on whether the toll tariffs are justified in terms of the road conditions and service provided to customers at the toll roads under investigation

Many drivers think that the cost of road use is disproportionate to the quality of the road provided and therefore prefer to avoid toll roads (Kyriakoglou, Politis, Georgiadis & Papaioannou, 2020:3). This interview question aimed to determine whether the toll tariffs are justified in terms of the road conditions and service provided to customers at the toll road concessions investigated for this study.

Participant 7

“Of course, the road conditions of the toll roads are good, although there are some problems in some areas. We are being overcharged for these especially when the infrastructure is paid-off and it’s just needing maintenance. So, the proper application of user pays is not being applied when it comes to many of our toll roads.”

Participant 11

“Definitely, if you look at the condition of the roads, if you look at the services that they offer in winter, they make sure that they burn the grass in between and on the side of the road, that is definitely value for money. There will be exceptions where potholes or something will occur, which is out of the control of the concessionaires, and we haven’t had incidents where these conditions or these bad road surface conditions have existed for anything longer than a week.”

Participant 12

“In our view, we are actually saying there is a complete contradiction there, because when you’re looking at the tariffs, the most people who will be actually affected are the most vulnerable and the taxi owners or taxi drivers because, you know, in terms of government, the ministers, the president, directors and everybody else, they are not going to feel the pinch. Those who are going to feel the pinch are the ordinary workers who are using taxis to go to work. As a result of the tariffs, taxis had to increase their tariffs, taking into account that the majority of our people are earning meagre salaries, you know, or are earning below the poverty line. Now there is a complete contradiction in terms of the tariffs that we are remaining opposed to, therefore, the issue of tariffs, they must be scrapped.”

Findings

According to the responses, the participants agree that the condition of the toll road concessions are good. However, they disagree on the toll tariffs, one participant posits that the road users are overcharged even when the toll roads concessions are fully paid up. However, all three of the toll roads examined are still servicing their individual debts and are using the revenue bonds model. Revenue bonds are secured with a specified revenue source and are bonds used to fund income-generating projects that are backed by future payments (toll tariffs) from facility users (Short & Peters, 2020:14). Another participant expressed that the toll tariffs negatively impact the poor (workers included) because taxi fares (public transport) increase due to toll tariffs.

b. Findings on whether SANRAL and the concessionaires effectively communicate with customers on toll payments and adjustments

Communicating toll payments and adjustments on a yearly basis is necessary. Communication is commonly acknowledged as a means for achieving stakeholder consensus and satisfaction (Project Management Institute, 2013). As a result, this interview question aimed to ascertain whether SANRAL and the concessionaires effectively communicate with customers regarding toll tariffs and adjustments.

Participant 7

“No, they just merely apply a CPI increase every year, the public has no say on whether these tariffs are too high, so no.”

Participant 11

“We have our own communication structures with SANRAL and concessionaires through WhatsApp groups. That message is relayed to us and we relate on to the members. The short answer is yes, there seems to be adequate communication. People might not always like the message that's communicated, but this is communication.”

Participant 12

“Not at all, their message to the ordinary members of our society, who are in fact not even educated, who cannot even express themselves in English, is ineffective. SANRAL would not even make a plan or a provision to accommodate those who cannot read and write to understand the necessity of paying tolls in this way. Message grant when they put these places. They are not looking at the poor and the vulnerable people as to how are they impacted by these tariffs.”

Findings

There are mixed reactions expressed by the participants. Participant 11 alludes that SANRAL and the concessionaires do communicate effectively with the customers regarding toll payments and adjustments. However, Participants 7 and 12 disagree. Participant 7 states that SANRAL and the concessionaires adjust toll fees by simply applying a CPI increase every year without any consultations. The consultation process should guarantee that the broad range of stakeholders affected by the organisations' (SANRAL and concessionaires) actions (toll payments and adjustments) are represented as much as possible (Jeffery, 2009:22). Participant 12 posits that their communication strategy is ineffective in the sense that is written in English and ordinary members of society are uneducated and cannot express themselves in English.

c. Findings on how the toll tariffs affect businesses and workers on a daily basis

This interview question aimed to ascertain how businesses and workers are impacted by toll tariffs on the toll road concessions investigated for this study.

Participant 11

“Well, I suppose it would be two ways that affects it, the one way is going to be how it affects your bottom line: - whatever you charging, you would include it in the cost of tolls, which would mean that using a toll road is not an issue, and this should be part of your planning.

The other way it's going to affect you is in terms of what your schedule or your delivery route is and what sort of time pressure you're under. Most toll roads are reasonably shorter than the alternative roads.”

Participant 12

“SANRAL have made a loan of 20 billion from the government, now, as a result, they have to pass these tariffs in order for them to pay the 20 billion loan they took from government, which in a way, it also put a burden on a worker because the taxi or transport will go up.”

Findings

From Participant 11's response, it can be deduced that toll tariffs affect a business's bottom line and the business mitigates this by passing on the toll costs to consumers. This means that variable costs, such as toll cost, kilometre cost, etc., must account for a larger portion of the total travel costs incurred by businesses (Tillema, van Wee & de Jong, 2003:4). Toll roads also have a positive effect on businesses through the schedule or delivery route, since the toll roads shorten the distance travelled by a business. Jou, Chiou, Chen, and Tan (2012) found that the average rate of tolling which drivers are prepared to pay for short trips is lower than that for medium and long trips. However, Participant 12 argues that the twenty billion loan is increasing the toll tariffs and this burdens the ordinary workers in terms of hikes in taxi fares.

6.3.3.3 Interviews on the infrastructure development of the toll road concessions studied

Issues surrounding infrastructure development and the maintenance on toll road concessions are examined in this subsection.

a. Findings on whether SANRAL and the concessionaires properly embark on routine, reactive, periodic, special and development maintenance on the toll roads under investigation

According to Oyedele (2015:1), maintenance is a strategy of renewing the environment of an infrastructure or preserving its worth so that it continues to serve the purpose for which it was procured. For this reason, this interview question sought

to establish whether SANRAL and the concessionaires properly embark on routine, reactive, periodic, special and development maintenance on the toll roads examined.

Participant 7

“Yes, I think so.”

Participant 11

“Well, as I said in the very beginning, one of the reasons why we use the roads is because they're in a good condition. We haven't seen what you've seen happening in a lot of local authorities where you can see the roads are just absolutely falling apart, and that's because no maintenance whatsoever. So yes, they do their job diligently, I would say, given their budgets.”

Findings

Based on the above responses, SANRAL and the concessionaires do properly embark on routine, reactive, periodic, special and development maintenance on the toll roads examined. Maintenance strategies must be developed and implemented to improve the management of toll road infrastructure (Karaa, 1989:422).

b. Findings on whether SANRAL maintain alternative roads in order to create options and improve access to markets and business centres

Other forms of road networks are needed to complement or to feed into toll road concessions. To connect new urban developments with other major roads (i.e. tolls, non-tolling, etc.) and improve regional accessibility, alternative roads are required (Andan, Puello & Geurs, 2019:180). For this reason, this interview question attempted to establish whether SANRAL maintains alternative roads to the toll road concessions investigated in order to create optional routes for road users and to improve access to markets and business centres.

Participant 7

“No, not at all, there are a number of alternative routes, which is a SANRAL's responsibility to maintain. So, if I do not want to take the toll road, I should have access to the original alternative routes. And in fact, in some areas, those

alternative routes are impossible to drive on them. They have been damaged by the weather and other conditions, rendering them to be impossible, as I said, they are holding the motorists captive to the toll roads. That is fundamentally wrong, and I think it does not suit SANRAL to maintain the alternative routes. They enrich themselves more than the toll roads. And they changed the law in that regard a couple of decades ago, which needs to be challenged.”

Findings

The above response disputes that SANRAL maintains alternative roads to the toll road concessions in order to create optional routes for road users and to improve access to markets and business centres. In some circumstances, commuters and other frequent travellers adopt an alternative road network to avoid paying tolls (Kyriakoglou et al., 2020:3). However, Participant 7 posits that these alternative road networks are damaged. Therefore, the alternative routes could have damages, high congestion, hijackings, potholes, accidents and be more time consuming. This fact results not only in toll revenue losses but also creates congestion and safety concerns when the adjacent roads are not constructed to manage large traffic volumes (Kyriakoglou et al., 2020:3).

c. Findings on whether SANRAL is in good standing in terms of credit rating in order to be able to afford the rollout of toll road infrastructure

The establishment of an unambiguous regulatory framework for SOE borrowing and the granting of credit guarantees are critical elements for the transparency, sustainability and credibility of public finances because a well-defined and clear institutional structure limits government's risk exposure (Prats & Moskovits, 2020:6). However, for a SOE (SANRAL) to be eligible for borrowing, its credit rating must be healthy and the guarantor's (government) credit guarantees should be in order. Credit guarantees are an undertaking or promise by the guarantor to pay one or more payments to the beneficiary or directly to its creditors if an occurrence of certain incidents lead to a significant deterioration of the creditworthiness of the institution promoted by the guarantee (Magnusson, 1999:2). For the government's credit guarantees to be declared healthy, the rating agencies must first assess and evaluate the sovereign credit ratings (SCR) of the government. The SCR refers to evaluating a governments willingness, potential and ability to service its debt in full and on time

(Bissoondoyal-Bheenick, 2005). With this information, this question item aimed to determine whether SANRAL was in good standing in terms of credit rating in order to be able to afford the rollout of toll road infrastructure.

Participant 7

“No, they do not have a good credit rating and that is as a result of their own problems that they self-inflicted. They will always blame society for not paying for the items and they never look to themselves as to what they got wrong. Reading other research recently, the biggest problem with the state and its entities like SANRAL, is that unless it convinces the public to participate, especially in electronic trading schemes (GFIP), they will fail, and this is basic research which they did not do. So now the schemes failed and they blame the public, it is just ludicrous. They have a bad credit rating because of their own bad management tactics, and no one is held accountable because of these poor decisions, and people just resign and move on but nothing happens to them.”

Participant 11

“SANRAL is a SOE (it's an entity of government), and for a long time we having saying that we think SANRAL is underfunded and that it is not being allowed to play the role it should. We see this to the president many years ago. Now the fuel levy raises about 40 billion rand a year, and I think that should be going to SANRAL. It shouldn't be going into the Treasury pot and then being used for other things.”

Participant 12

“SANRAL borrowed 20 billion from government to erect all these gantries and so forth. Therefore, in my view, I do not think that their credit rating is sound.”

Findings

There is an agreement amongst the participants that SANRAL is not in good standing in terms of credit rating to be able to afford the rollout of toll road infrastructure. Imposed obligations on SOEs, such as servicing uneconomic markets, price suppression and various employment-related restrictions might contribute to the decline of a SOE (Ginting & Naqvi, 2020:10). However, unlike private firms, the government provides different kinds of subsidies and capital injections to SOEs when their revenue sources fall short of covering costs or when they are avoiding default (Ginting et al., 2020:10). This can be better achieved when the sovereign credit rating of the government is in good standing. Another challenge, as cited by Participant 7, is that SANRAL's credit rating is adversely affected by the GFIP and its bad management. Corruption, inadequate systems, poor planning, corrupt political involvement and a lack of suitable skills all contribute to this PPP's poor performance and failure (Seeletse, 2016:22). Participant 7 further alludes that no one is held accountable because of these poor decisions, and people just resign and move on and nothing happens to them. According to Jones and Stewart (2009), in practice, the propensity toward shared accountability in PPPs devolves into joint irresponsibility with no one ultimately accountable.

6.3.4 Section D: African National Congress and Economic Freedom Fighters (Political Parties)

This section focuses on political parties and trade unions. In terms of representation of political parties, both the ANC and the EFF were selected, and the SAFTU was selected as representative for the trade unions. The responses of the ANC, EFF and SAFTU were evaluated and tested against those in Section A (Government Departments) and those in Section B (Government Agency and Concessionaires (Agents)).

6.3.4.1 Interviews on the compliance to and implementation of existing policy, regulatory and legislative frameworks for PPPs

This subsection focuses on the compliance to and implementation of existing policy, regulatory and legislative frameworks governing PPPs.

a. Findings on whether regulations and manuals (such as the Public Finance Management Act, Regulation 16 of 1999 and PPP Manual) governing the PPPs on toll road concessions in SA are still sound and adequate

The Public Finance Management Act, Regulation 16 of 1999 and PPP Manual is a mechanism used to govern the PPP sector in order to achieve efficiency. If PPPs are well-governed, they can improve effectiveness and efficiency by compensating for one party's limitations with the strengths of another while the parties' individual strengths add up to produce synergies (Seeletse, 2016:19). As a consequence, this interview question sought to establish whether the Public Finance Management Act, Regulation 16 of 1999 and PPP Manual governing the PPPs on toll road concessions in South Africa are sound and adequate.

Participant 9

“Look, from a political point of view, as a matter of principle, yes, those legislative prescripts are sound in a sense that the new democratic dispensation for the last twenty-five years or so, the governing party has adopted a mixed economy, meaning it had to go into partnership with the private sector. So, the political dispensation is anchored on a mixed economy than an economy that is hostile to the private sector.”

Findings

The above response posits that regulations and manuals (such as the Public Finance Management Act, Regulation 16 of 1999 and PPP Manual) governing the PPPs on toll road concessions in South Africa are still sound and adequate. Participant 9 further alludes that the PFMA and PPP Manual are designed in such a way that government agencies are able to enter into sound partnerships with the private sector and that they even embrace a mixed economy system. In essence, a mixed economy system is a market economy where, in addition to private firms and agents, the government

participates by playing a role of control and co-ordination or direct participation in the economic process by means of its public sector (Spânulescu & Gheorghiu, 2020:1).

b. Findings on whether SANRAL and the concessionaires perform their functions within the parameters of the SANRAL and National Roads Act, No. 7 of 1998, in terms of managing and controlling toll roads in SA

For SANRAL and the concessionaires to perform their functions in order to achieve the objectives of the SANRAL and National Roads Act, No. 7 of 1998, their functions must be co-ordinated. The shared functions between organisations should be co-ordinated and harmonised in order to attain the overall objective of the Act (Connor, McFadden & McLean, 2012:1). As a result, this interview question was aimed at determining whether SANRAL and the concessionaires perform their functions within the parameters of the SANRAL and National Roads Act, No. 7 of 1998, in terms of managing and controlling toll roads in SA.

Participant 9

“Well, I think so in general, you see, the biggest problem with SANRAL was that of the e-tolls. I think that's where they got the sort of negative publicity on how they managed it and the secrecy with which they managed it, you know, created more problems to them. But I think generally because there has not been a major problem with the toll roads that we have each end for and so on. Problems that were there with the toll roads seem to have been resolved, especially from the nearby farmers use in those national roads. And so, you know, so I think so far, they have handled many of these toll roads quite well. The only negative publicity, the significant lookout was around the e-tolls and that was only inherited.”

Participant 10

“Oh. I don't think so, because already indirectly through e-tolls, they have taken that responsibility to someone else and they are not running this thing efficiently. Their mandate is sufficient. It will mean that our roads should be self-sufficient. They must be able to maintain themselves without any assistance from as far as Austria.”

Findings

The responses expressed differ in the sense that the participants do not agree that SANRAL and the concessionaires perform their functions within the parameters of the SANRAL and National Roads Act, No. 7 of 1998, in terms of managing and controlling toll roads in SA. Participant 9 agrees that SANRAL and the concessionaires perform their functions within the parameters of the SANRAL and National Roads Act, No. 7 of 1998, however, also states that SANRAL and the concessionaires are embroiled in a high level of secrecy in managing these concessions. Many values and principles are defeated by the usage of PPPs in the sense that commercial secrecy and a lack of transparency complicates inter-organisational relationships based on informal and formal rules (Institute for Public Policy Research (IPPR), 2004). Transparency in this instance includes the right to information on the three toll roads investigated in order to eradicate the element of secrecy. Therefore, all stakeholders should be privy to the financial records, performance outcomes, etc. (Jones & Stewart 2009; Acar, Chao & Kaifeng 2008; Behn, 2001). However, the main obstacles to PPP project disclosure appears to be the public entities' reluctance to give information in the absence of a clear mandate, a lack of practical internal guidance, inaccuracy or nonavailability of data, costs and time disclosure and a lack of oversight systems (World Bank, 2016:3). Participant 10 disagrees that SANRAL and the concessionaires perform their functions within the parameters of the SANRAL and National Roads Act, No. 7 of 1998, and states that SANRAL should manage toll roads in SA without the help of concessionaires and these roads should sustain and maintain themselves.

c. Findings on whether there should be a regulatory body for the toll roads subsector

Regulatory bodies seek to balance the public and business interests for the common good. The premise is that by enacting regulatory measures, regulatory bodies can minimise or eliminate inefficiencies caused by market failures (McCraw, 1975). Therefore, this interview question attempted to determine whether there should be a regulatory body for the toll road subsector.

Participant 9

“Well, a regulatory body can be a problem because in my view, those legislations you talk about the PFMA and all that, they are overly regulated. South Africa is generally overly regulated, of course, for a good reason to allow for transparency, to allow for proper selection of companies that have to go into this kind of service providers. However, if you are going to have another regulatory board when you still have SANRAL, for me, that will be sort of over-regulating the industry on top of what is already overregulated.”

Participant 10

“Yes, it should be formed because a regulatory body will from time to time, look at the needs of road users, vis-a-vis toll road price increase. So, you need such a body to really mediate between and be as best as possible and the decisions must be scientifically based, must not be based on emotions.”

Findings

There is a divergence of opinion regarding the establishment of a regulatory body for the toll roads subsector. Participant 10 alludes that a regulatory body should be established in order to mediate over issues such as price increase, etc., that are concerned with toll roads in SA. An acceptable third party (regulatory body) who has limited or no authoritative decision-making power intervenes in a negotiation or a conflict to help the involved parties in voluntarily reaching a mutually acceptable settlement of the points in dispute (Moore, 2003:15).

However, Participant 9 does not condone the idea of establishing a regulatory body, citing that the PPP sector is already overly regulated. It is critical to maintain an ongoing focus on the process of formulating and implementing better regulation across the government and the public sector in general to ensure that the degree of regulation is proportionate and does not impose any needless restrictions (Competition and Markets Authority, 2020:3). Despite the concerns raised by Participant 9, the South African PPP regulatory environment is considered less cumbersome and less regulated as compared to that of Nigeria (Arimoro, 2020:9).

6.3.4.2 Interviews on the functions of SANRAL and the concessionaires regarding the toll road concessions investigated

This subsection aimed to determine whether SANRAL and the concessionaires perform their functions diligently.

a. Findings on whether SANRAL adequately oversees the planning, design, construction, operation, management, control, finance, maintenance and rehabilitation of the toll roads examined which are performed by the concessionaires on its behalf

The maintenance of toll roads is crucial. The objective of road maintenance is to continuously lower the degree of road deterioration (Suwanto et al., 2021:2). Despite South Africa being the continent's economic powerhouse, about a 38% of its non-toll roads are in fair to poor condition (Mostafa, 2018:3). Since SA has 38% fair to poor non-toll roads, this interview question aimed to establish whether SANRAL adequately oversees the planning, design, construction, operation, management, control, finance, maintenance and rehabilitation of the toll roads as performed by the concessionaires on its behalf.

Participant 9

“I am happy at the level of maintenance at the toll roads concessions, they are in a good state. In fact, South African roads are rated high, in particular in the continent and even among some of the developed countries, and SANRAL has done quite a sterling job. My concern is that somehow SANRAL has become a referee and a player, and when it comes to the management of things that defeats a bit of our constitutional mandate, the transparency and accountability. But I am quite convinced that the maintenance of the toll roads is quite in order.”

Findings

The above response agrees that SANRAL adequately oversees the planning, design, construction, operation, management, control, finance, maintenance and rehabilitation of the toll roads examined for this study, and as performed by the concessionaires. Participant 9 states that the toll road concessions examined are in good condition. SANRAL and the concessionaires are getting it right with their maintenance strategies, which include routine, periodic and special (urgent) maintenance (Mostafa, 2018:3).

However, Participant 9 raised a concern that SANRAL operates as both a referee and a player which, according to Participant 9, is unconstitutional.

6.3.4.3 Interviews on the Portfolio Committee on State-owned Enterprises' oversight on the management of PPP agreements in SA

It is worth mentioning that the Portfolio Committee on State-owned Enterprises has limited expertise and skills and in order to perform its oversight role effectively it requires help from other parliamentary committees. For the purpose of this research study, it is necessary to explain the roles performed by each committee involved in the oversight of the SOEs:

- The Auditor-General's annual audit reports and financial statements are reviewed by the Standing Committee on Public Accounts (SCOPA); and
- The Portfolio Committee on State-owned Enterprises exercises oversight over the performance of SOEs and as such, evaluates the non-financial information contained in the SOEs' annual reports and is concerned with service delivery and improving economic growth (Du Toit, 2005:1).

In complementing the work of the abovementioned committees, the Standing Committee on Finance plays a key role in the present context, considering its oversight responsibilities relating to the National Treasury and the fiscal framework (Jahed et al., 2015:3). Therefore, this subsection is based on the performance of the Portfolio Committee on State-owned Enterprises and other related committees in executing their oversight role.

a. Findings on whether the Portfolio Committee on State-owned Enterprises and other relevant parliamentary committees perform their oversight duties adequately in terms of monitoring SANRAL and concessionaires

Ideally, exercising a parliamentary oversight role over SANRAL is beneficial and necessary. The Portfolio Committee on State-owned Enterprises and the Standing Committee on Public Accounts (SCOPA) have typically been responsible for the parliamentary oversight of SOEs, including finances (Jahed et al., 2015:3). As stated above, the Standing Committee on Finance might also get involved in the oversight exercise over SANRAL and this interview question sought to ascertain whether the Portfolio Committee on State-owned Enterprises and other relevant parliamentary

committees perform their oversight duties adequately in terms of monitoring SANRAL and the concessionaires.

Participant 9

“Well, there is always a problem with parliamentary oversight, because if you look at how they act, they are more like a public relations exercise. The extent to which the executive is reluctant to go to parliament and the executive is not taken to task for this, there is something a bit wrong with the oversight at the parliamentary level. And this does not only apply to the infrastructure, the committee that deals with infrastructure generally applies to all subcommittees. And then the other thing is the oversight, for instance, at the parliamentary level, is done through the ministries that we have like the Subcommittee on Transport. And because SANRAL falls under transport, you may find that there is so much congestion of issues to be dealt with, find its policy, its implementation, it's regulation by the time you deal with it. Quite practical issues of infrastructure, you know, a lot is missed because of the congestion of the things that are there. So, at the parliamentary level, I still feel that more still has to be done.”

Findings

The above response indicates that the Portfolio Committee on State-owned Enterprises and other relevant parliamentary committees do not perform their oversight duties adequately in terms of monitoring SANRAL and concessionaires. Participant 9 denotes that the executive is reluctant to go to parliament and is not taken to task for this and concludes that there is something wrong with the oversight at the parliamentary level. Ideally, the executive authority must play a proactive and constructive role in an SOE's governance and it should monitor, oversee and review the SOE's practices, behaviour, affairs, activities and conduct in terms of its oversight (Du Toit, 2005:6). In support of this assertion, Price Waterhouse Coopers (PwC) (2011:9) alludes that the parliament, line minister and boards of SOEs are in charge for the oversight of the performance of SOEs.

b. Findings on whether the Portfolio Committee on State-owned Enterprises and other relevant parliamentary committees ensure that the toll road concessions investigated provide value for money

Hang (2016, 124) posits that a value for money analysis is seen as a useful tool for assisting in the decision-making process for PPPs and that it is widely utilised by many governments. The PPP decision-making process, which is guided by the VFM evaluation, unfolds early in the process and before the PPP project is officially adopted or approved. In support of this notion, Tsukada (2015) points out that, in comparison to a publicly funded project, VFM is used to determine how much money the government will eventually pay to the private sector. Therefore, the VFM process precedes the oversight role and this could mean the decision around VFM might not feature in the scope of these committees. For this reason, this interview question sought to establish whether the Portfolio Committee on State-owned Enterprises and other relevant parliamentary committees were allowed to participate in the PPP decision-making process regarding the approval of the toll road concessions investigated in order to ensure the VFM.

Participant 9

“I don't think they are capable of that because these are decisions that are taken at executive level. The issue of conscience concession is. And at that level, parliament is structured in such a way that it does not sort of. Strictly define the terms of reference or terms of contracts. So, and the you know, it all contracts is a good example where when the former CEO of SANRAL was to give Parliament and other stakeholders information on the contract, it was so there were so many spaces where it was made dark so that the information does not go out. That shows that there was no way that a parliamentary committee could be able to evaluate the information. Total dark on those aspects, so I don't think it is capable of that. And secondly, it's the fact of the fact of it not being allowed to do so.”

Findings

The above response indicates that the Portfolio Committee on State-owned Enterprises and other relevant parliamentary committees are unable to ensure that the toll road concessions under investigation provide VFM because some information on VFM and other PPP issues are hidden from these committees. Participant 9 further alludes that the decisions on VFM or return on investment (ROI) are taken at the executive authority level. As the shareholder of an SOE, the executive authority is concerned with the return on investment (ROI) or VFM, which it achieves by monitoring, reviewing and overseeing that the SOE's strategic and business plans, as well as its actual operations, performance and delivery are successfully completed (Du Toit, 2005:6).

c. Findings on whether evidence based technical expertise or political influence played any role in the selection of the DCFOM model used on the three road concessions investigated

Private investors will not be inspired to invest in an environment where PPP policies are not recognised and acknowledged politically (Osei-Kyei & Chan, 2017:102). Political acceptability and buy-in give the private sector and lenders a reason to invest into a PPP project. According to research, national PPP developments are influenced by a variety of factors, including political commitment (Flinders, 2005), and Osei-Kyei et al. (2017:102) further states that acceptability and political support for PPPs are ranked as priority factors attracting private sector investments. However, when politics influence the adoption of a PPP model for nefarious means, such as patronage, corruption, etc., in the absence of technical expertise, then the institutional quality weakens. If countries use PPPs for political patronage, we would expect countries with lower institutional quality to employ PPPs more frequently and extensively (Maskin & Tirole, 2007). As a consequence, this interview question sought to ascertain whether technical expertise or political influence played any role in the selection of the DCFOM model being used for the three of the toll road concessions investigated.

Participant 9

“Look, there's always an outcry about political tampering on many things of government. Now you can't rule it out on that basis. I think I don't want to pre-empt the investigation personally, but because there's this outcry, one has to wait for the outcomes.”

Findings

The above response insinuates that there is a possibility of political influence in the selection for the PPP model used by the three concessions. In the context of principal-agent theory, PPP models are vulnerable to political and governance challenges arising from unethical behaviour and corruption (Schomaker, 2020:808).

6.3.4.4 Interviews on toll tariffs

A myriad of issues influence the toll tariffs and this subsection sought to establish if the proper procedures are taken when introducing new tariffs to the public.

a. Findings on whether the toll tariffs are justified in terms of the road conditions and service provided to customers at the toll roads under investigation.

In the toll road concessions, the private investor seeks profit-maximising prices to charge users (Jaworski, Liberadzki & Liberadzki, 2018:55). The private sector is profit-oriented and if this is not managed properly in the toll road concession setup or arrangement, this could lead to serious misunderstandings. Each private partner in the toll road project must recognise at the beginning phase of the investment that such a beneficial price determination will be difficult to achieve in practice (Jaworski *et al.*, 2018:55). This interview question sought to determine whether the toll tariffs are justified in terms of the road conditions and service provided to customers at the toll roads investigated.

Participant 9

“Look, as a principle, yes, but I'm only worried about the amounts. You know, I think we have to pay for the roads so that there is continuous maintenance. I agree with that. But I find some tolling fees quite exorbitant. If you take the same

info that goes up to Nelspruit or passengers up to Mozambique, I mean, tolling is quite expensive. So, I don't think it is. The amounts are quite fair to ordinary people use those tolling, especially in a depressed economy like ours.”

Findings

Participant 9 agrees that the toll fees are justified but is concerned about the high toll fees on the toll road concessions examined. In general, everyone pays the full marginal social costs of their trips when using toll roads, irrespective of their individual characteristics or when they travel (Lindsey & Verhoef, 2000:1). The implication is that the toll fees can either be high or low depending on a road user's circumstances. However, the issue is when the concessionaires make more than enough revenue. With rising costs in capacity provision, the revenue generated by the optimal toll surpasses the amount required to pay for the optimal capacity, making the road self-financing (Jaworski et al., 2018:55). Under these circumstances, the special pricing structure should be effected outside the conventional pricing regime structure which is determined by the CPI.

b. Findings on whether SANRAL and the concessionaires communicate effectively with customers regarding toll discounts, payments and adjustments.

This interview question sought to determine whether SANRAL and concessionaires communicate effectively with customers on toll payments and adjustments.

Participant 9

“No, I don't think so. In fact. As a road user and the highway road user myself, I don't even know whether that just counts or what I don't know, so I don't think there's effective communication to it.”

Findings

The above response indicates that SANRAL and the concessionaires do not communicate effectively with customers regarding toll discounts, payments and adjustments. This could simply mean that SANRAL and the concessionaires do not have an efficient strategy for communicating with communities.

6.4 SUMMARY OF THE FINDINGS

Since 1988, the NRF/SANRAL portfolio fund has not received a portion of the fuel levy (Nieuwoudt, 2009:92). This has placed SANRAL into a tight financial position, hence the government opted for toll road concessions. However, toll road concessions require a well thought out management plan to maintain the road conditions. A solid and comprehensive road management and maintenance system is required to maintain the toll roads in great working condition (Suwanto et al., 2021:1).

This study revealed that amongst the three concessionaires, only one has a full maintenance department, and that the other two concessionaires prefer to outsource their maintenance. The main objectives of outsourcing are to save costs, save time and improve the quality of outputs and the concessionaires may identify suitable specialists to execute the job for cheaper, faster and better (Dogerlioglu, 2012:22). It also assists organisations to focus on their core competencies while also reducing risk (Haider, Samdani, Ali & Kamran, 2016:18). Outsourcing, on the other hand, results in massive job losses, cultural and national tensions and reputational damage (Krishna, Sahay & Walsham, 2004). In-house skills are necessary to insource some activities which will result in cost-saving measures.

The study established that the toll road concessions examined for this study are embroiled in secrecy due to a lack of transparency which other stakeholders perceive as the real obstacle to accountability. In the context of SA, there is no overarching legislative framework that tackles the various transparency and accountability challenges that arise in PPPs even though the Public Finance Management Act emphasises the need for accountability and transparency in public procurement (Fombad, 2014:84). Therefore, it should be noted that there is basic information that should be shared with other stakeholders without compromising the confidentiality clause, however, in practice, commercial confidentiality is used to prevent the public from accessing the necessary information regarding the PPP projects. This is, at least in part, due to the fact that, unlike schools and hospitals, the business cases used to support the establishment of PPPs in preference to public finance have not been placed in the public domain for reasons of 'commercial confidentiality' (Shaoul et al., 2006:6). Shaoul et al., (2006:17) further state that due to a lack of such information, control, accountability and scrutiny are all but impossible to achieve.

In terms of the DCFOM model, the data collected for this study revealed that the concessionaires took on all the risk for the design, construction, finance, operation and maintenance of the concessions awarded to them. A PPP is, at its core, a risk-sharing arrangement to achieve specific policy outcomes (Lewis, 2001:2). The concept of risk-sharing suggests that both parties have something to lose if the partnership underperforms (Lewis, 2001:2). The three toll road concessions examined for this study are nearing the end of their contracts, and going forward, SANRAL must reconsider the model, especially regarding the risk-sharing for design (see par. 6.3.1.5(c)). In future concessions, SANRAL can also consider a differentiated or individualised model for each concession and repackage the risk-sharing factor according to the needs, requirements and circumstances of individual toll road concessions. Therefore, the risk-sharing should be customised to suit every individual toll road concession in the future.

The data also revealed that politics can either positively or negatively influence the adoption of the PPP model. The data indicates that there are cases where political tampering was used to push for the selection of a PPP model with no regard for the country's institutional quality, preparedness, circumstances, requirements and needs. Countries with low levels of institutional quality that operate PPP programs may feel compelled to implement PPPs to the fullest degree possible since they have already invested in the institutional structures to do so, even if they lack the capacity to do so successfully (Reyes-Tagle et al., 2016:4). However, a positive role played by politics is that politicians advocated for the adoption of PPPs notwithstanding the role played by technical expertise (see par. 6.3.1.5(a)). The study also revealed that one of the reasons for adopting the DCFOM model was that the government was running short on funds and the only way out was to invite the private sector to participate in the rollout for toll road infrastructure (see par: 6.3.1.5(c)).

According to the data, the strength of the DCFOM model is that the demand risk is not the burden of the government in toll road concessions, and if some big event leads to a revenue shortfall, then the government will come-out unscathed because the model transfers the demand risk to the concessionaires (see par: 6.3.1.5.2). However, according to the data, the weakness of the model is that the toll road concessions accommodates both trucks and cars indiscriminately, and trucks inflict damage on the

toll road infrastructure without serious consequences due to the fact that this model is based on traffic volumes. A road system that accommodates both trucks and cars is more costly than a road system that only accommodates smaller trucks and cars (Hau, 1992:ii).

This study discovered that the SANRAL and National Roads Act, No. 7 of 1998, empowers SANRAL but consequently has given SANRAL too much power (see par. 6.3.1.1(c), 6.3.1.5(b) and 6.3.4.2(a)). It was discovered that SANRAL plays two roles in the toll road concession space, first as a player and secondly as a referee, and the SANRAL and National Roads Act, No. 7 of 1998, aids in enabling SANRAL to play both these roles. To compound the situation, the Portfolio Committee on State-owned Enterprises, the Standing Committee on Public Accounts and the Standing Committee on Finance do not hold SANRAL and the executive authority accountable in the sense that even the executive authority is reluctant to go to parliament. A subcommittee on transport, which falls within the Ministry of Transport, is also not exercising its oversight role effectively because there is a myriad of transport related issues to be tackled at the same time and the committee does not have the capacity to deal with the workload.

It was discovered that TRAC must deal with the various regulatory and legislative frameworks of two countries, namely Mozambique and South Africa (see par. 6.3.2.1(e)). This has placed TRAC in a peculiar situation in that they are managing the N4 roadway inside both countries, therefore its responsibility for the N4 toll concession does not end at the border post. This kind of cross-border arrangement requires a high level of co-operation between Mozambique and South Africa which is sometimes threatened by a diplomatic row or tensions, i.e. anti-gen COVID-19 tests at the cross-border early in 2021 and political instability in both countries, i.e. ongoing Cabo Delgado insurgency conflict in Mozambique and the last July unrest in parts of the Gauteng and Kwazulu-Natal provinces of South Africa.

This research also revealed that there is a need for dedicated traffic police to deal with traffic-related issues at the toll road concessions (see par. 6.3.2.2(c)). If established, the scope of this police force could be extended to deal with other issues, such as the social unrest that engulfed parts of Gauteng and Kwazulu-Natal in 2021. The N3 Toll Road was closed, and this closure had a devastating impact on the economy and

travelling in general. Therefore, this police force would relieve other enforcement agencies' duties on toll roads.

6.5 CHAPTER SUMMARY

This chapter demonstrated the importance of a regulatory and legislative framework for the toll road concession sector. The lack of oversight over SANRAL and the concessionaires from parliament was thoroughly discussed and the roles of various parliamentary committees involved in this process were explained. The dynamics behind the adoption of the PPP model used by all three of the toll road concessions examined for this study were highlighted. The participants mentioned that the annual tariff hikes are based on the CPI, however, the study has demonstrated that there are other factors that may affect the toll tariffs outside of the CPI. It was also discovered that all participants agree that the concessionaires perform infrastructural maintenance on the regular basis and that the conditions of the toll road concessions are of a high standard. The best practices and proposed PPP model are discussed in the next chapter.

CHAPTER 7

SUITABLE MODEL FOR THE TOLL ROAD CONCESSIONS STUDIED AND BEST PRACTICES

7.1 INTRODUCTION

The previous chapter raised concerns regarding the risk-sharing, particularly for the design risk. Therefore, this chapter focuses on the possibility of the design and financial risks for the toll road concessions under examination being shared equally between the government and the private sector in the future. The durations still left on the toll road concessions under investigation range from 6 to 9 years. The PPP model proposed in this study for future toll road concessions is discussed below.

7.2 PUBLIC-PRIVATE PARTNERSHIP MODEL

The design, construct, finance, operate and maintain (DCFOM) model is in use for all three of the toll road concessions examined for this study (see par. 6.3.2.3(b) and par. 6.3.2.3(c)) and the private partner assumes the design, construction/build, financial, operational, maintenance and demand risks under this model. As a result, the government is immune to the major risks associated with toll road concessions, although not completely immune under this model. For example, if something major happens to the toll road concessions where the private partners are unable to service their debt to lenders, then the government will have to step in due to the fact that it has already committed itself through a partial credit guarantee (see par. 6.3.3.3(c)).

The decision regarding the extension of the three toll road concessions once their current contracts have ended has not been made yet. At the end of the current toll road concession contracts, the other option available to the government is to absorb the toll road concessions. Therefore, the decision to extend the current toll road concessions or enter into new concessions with new private partners will involve the SANRAL board of members internally and the Minister of Transport and the National Treasury externally. If the relevant decision-makers decide on the extension of the toll road concessions examined for this study going forward, then this process must be informed by the feasibility studies. The feasibility studies must demonstrate whether the PPP model of choice is affordable, transfers appropriate technical and operational risk to the private party and gives value for money (National Treasury Module 4,

2004:3). Furthermore, according to Section 16.4.1 of the PFMA, Regulation 16 of 1999, to determine whether the proposed PPP is in the best interests of an institution (SANRAL in this case), the accounting officer must undertake a feasibility study that explains the strategic and operational benefits of the proposed PPP for the institution in terms of its strategic objectives and government policy. For these reasons, the chief executive officer of SANRAL is compelled to oversee the feasibility study process to ensure it satisfies the conditions of the PFMA. A PPP model borne from the study is proposed in the next section.

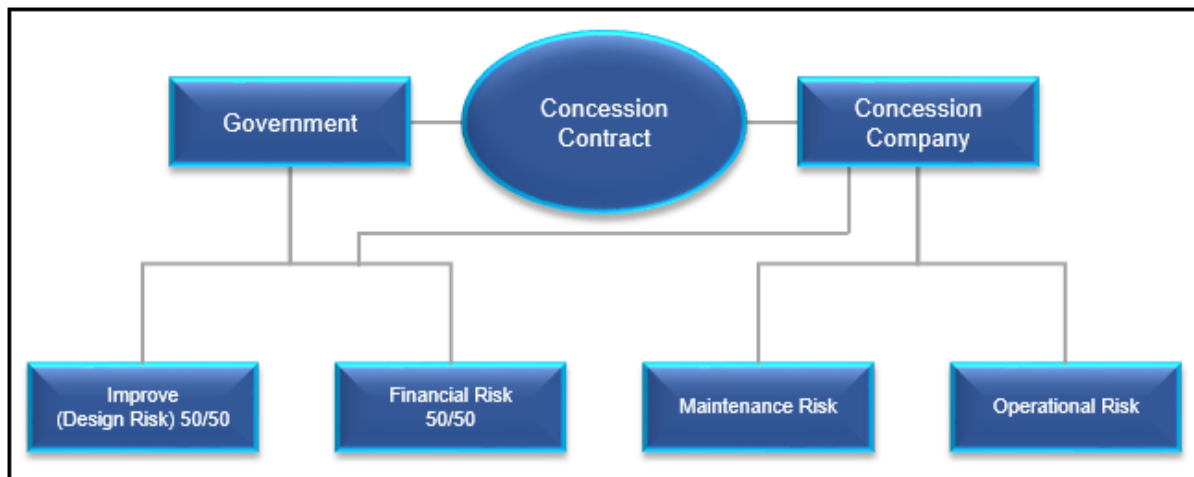
7.3 THE PROPOSED MODEL AND ITS JUSTIFICATION

This study proposes the improve, finance, maintain, operate and transfer (IFMOT) model. This proposed model will be relevant if the SA government (N3 & N1N4), along with the Mozambican government (N4), decides to extend the current toll road concession contracts or enter into completely new toll roads concession contracts with new private partners at the end of the current toll road concession periods. The study proposes that the N3, N4 and N1N4 toll road concessions adopt the IFMOT model because these infrastructures already exist and constantly require improvements (see par. 4.3.3). In terms of the financial and design risks associated with this model, the SA government, through SANRAL, can share these risks with the private sector on an equal basis (50/50). The variation that exists in practice is informed by the risk-bearing and separation of ownership between the public and private sector actors (Roehrich, Barlow & Wright, 2013:7). It is important to mention that some improvements will still require designs despite the road construction being completed. Therefore, the design risk will fall under improvement in this model (IFMOT).

The financial and design risk-sharing will improve the government's benefits gained from these PPP arrangements since the more risk one takes the more one benefits from the project. Pfisterer, de Boer, Mudde, van Dijk and van Tulder (2009) note that PPP partners do not always share costs and rewards evenly, which might hurt the partnership's strength. These negative consequences are due to the private partners assuming most or all of the financial and design risks and profiting more than the government due to the increased risk taken. The government is currently sourcing for other means of improving its public funds and taking more calculated risks, such as increasing its shareholding in the special purpose vehicle (SPV). By assuming more

financial and design risks the government can improve its reserves significantly. Therefore, by sharing the design and financial risks with the private sector on an equal basis, it will enable the government to increase its struggling public funds in the long term. It should be noted that under this type of PPP arrangement (namely sharing of financial and design risks) the public sector is still going to benefit from the private sector. The purpose of the PPP is for the public sector to benefit from the private sector's financial capabilities, expertise and technical skills (Khahro, Ali, Hassan, Zainun, Javed & Memon, 2021:2).

The above argument is supported by the principle of risk allocation found in PPPs, which advocates for risks to be assigned to the party best equipped to manage them (Hovy, 2015:1). In the current PPP arrangement, the three concessionaires are allocated all the design, financial, construction, operation and maintenance risks. Based on the number of years these three toll concessions have been in operation, the government should have gained the necessary expertise and capacity to handle the financial and design risks hand-in-hand with the private partners. It should be noted that the current concession contracts have a skills transfer clause, in which the concessionaires are expected to share new skill sets and technology with SANRAL because road technology, like other types of technologies, is constantly evolving. However, it is also worth noting that SANRAL has been independently running and operating toll roads on behalf of the government for decades (i.e. N1, N2 South, N17, etc.), and it has been bearing all of the associated risks regarding these toll roads. As a result, SANRAL is already in possession of the requisite skills, technology, expertise and experience to successfully assume the financial and design risks on a 50/50 basis with the concessionaires of the toll road concessions. Below is the risk-sharing structure for the proposed model:



Source: Researcher

Figure 7.1: Risk-Sharing Structure for the Proposed Model

From the above risk-sharing structure, the government and private sector will be allocated design and financial risks on a 50/50 basis and this means that all three of the toll road concessions will be financed by a mixture of equity and debt if their current contracts are extended or new partners are brought in at the end of the contracts. However, it is worth mentioning that the returns or profits from a mixture of debt and equity are uncertain because of changes in exchange rates, interest rates, ownership and other factors (Shen, Platten & Deng, 2006:593). The above proposed risk-sharing structure can bolster the SPV's funding to lenders because the credit viability or credit score of the SPV will be made up by the concessionaires and the government equally. The lenders' decisions to provide debt financing are based on the SPV's financial and credibility capabilities (Ehlers, 2014:10). As a result, the credibility and financial capacity of both partners are critical to unlock debt financing. This study recommends that the user fee payment be used to enable both partners to earn returns on their investment under this risk-sharing structure. As a consequence, both partners bear the demand risk.

This risk-sharing structure places the operation and maintenance in the hands of the concessionaires. For operation and maintenance, the IMFOT model provides a single-party risk allocation (National Academies of Sciences, Engineering and Medicine, 2009:D-10). As a consequence, the details of a new contract management should exclude the construction risk. It is appropriate to leave the operation and maintenance in the hands of a private partner because they are able to implement operation and

maintenance activities quicker than the public sector. The reason for this, in the context of SA, is that the private partner is not limited by the PFMA in executing operation and maintenance activities, particularly in PPP arrangements.

From the above risk-sharing structure, it is worth noting that the design risk falls under improvement. Therefore, to improve the existing toll road infrastructure everything starts with design. This study also proposes twenty-year long-term contracts between SANRAL and the concessionaires if the existing concession contracts are extended or new private partners are brought in at the end of the current concession period for the toll road concessions. The proposal for a twenty-year duration is informed by the fact that a return on investment will be reached sooner for both SANRAL and the concessionaires because the road infrastructure for the proposed toll road concessions is already in place and in good condition. The next section focuses on the risk-sharing in relation to the proposed model.

7.4 RISK-SHARING IN RELATION TO THE IFMOT MODEL

Like all other PPP models, the IFMOT model is not immune to risk. Therefore, all PPP projects, like any other infrastructure project, carry risk. Due to high initial expenditures, long-term asset durability, large irreversibility (sunk costs) and high complexity (e.g. many parties involved with different constraints and objectives), road infrastructure projects are particularly vulnerable to risk (Checherita & Gifford, 2007:2). Therefore, if the current contracts for the toll road concessions examined for this study are extended or new partners are brought in at the end of the current contracts, the details of a new contract should differ on construction risk in particular because the construction has already been completed for these concessions. Therefore, the PPP partners are encouraged to share the financial and design risks on an equal basis to increase the chances of securing funding for the PPP projects under discussion. Because private partners are 'huge risks' with a higher default probability than the government, they will confront less favourable financing circumstances in capital markets whereas the government is viewed as less 'risky' due to the fact that it benefits from its ability to collect tax (Dewatripont & Legros, 2005:133). According to classical agency theory, the risk-sharing concept:

- is the most efficient solution, as well as the one with the best reward or payoff for the government; and
- it is therefore in the government's interest to protect the private partners from external risk (Dewatripont et al., 2005:133).

According to the above, risk-sharing where the government and private partners borne design and financial risks on an equal basis, as this study proposes, will increase the benefits to the government and will also reduce the risk premium that the government usually pays on behalf of the private partner. The government will significantly reduce the risks faced by the private partners by sharing the financial and design risks equally.

7.5 TYPES OF RISKS IDENTIFIED FOR THE IFMOT MODEL

This study advocates for the government to share design and financial risks with the private partners on an equal basis under the proposed model (IFMOT). These two risks identified are discussed below.

7.5.1 Financial risk

Shen, Platten and Deng (2006:593) conclude that financial risk should be shared between the government and private partners. Under the IFMOT model, the expectation is that if the government enters into a financial risk-sharing arrangement with private partners for toll road concessions in the future, the terms of loan will be much better. Since infrastructure projects require a huge amount of financing with payment terms that are diluted over an extended period of time, such challenges pave the way for PPPs to ensure that infrastructure services are financially viable (Smithson & Hayt, 2001). The financial risk-sharing between the government and the concessionaires will ease the payment terms for large sums of borrowed capital to a certain degree. However, this financial risk-sharing arrangement has its own difficulties, politics and dynamics. Concerns have been expressed regarding PPP financing, particularly for risk-sharing arrangements between two parties, namely the government and the private entities (Checherita et al., 2007:2) and at the top of these concerns is an unfavourable risk return trade-off (Burger, Tyson, Karpowicz & Coelho, 2009:17). In the case of the toll road concessions examined, if their contracts are extended or new contracts are established with new private partners, the financial risk-

sharing agreement between government and private partners should be crafted in such a way that the number of concerns are reduced for both parties.

One of the biggest distinctions between PPPs and traditional procurement is the shifting of the responsibility of mobilising funding for infrastructure projects to the private sector (International Bank for Reconstruction and Development, 2017:40). However, there is another concern, PPPs have been an attractive option for governments trying to make their accounts look good, thereby (ab)using public accounting rules that do not correctly capture government assets and liabilities. A PPP then creates the impression that public debt has not grown as much following an investment project. According to classical agency theory, the shift of the financial risk to the private sector is because:

- less risk averse agents should bear more risk; and
- the trade-off between insurance and incentive provision. Therefore, try and filter out exogenous risk (e.g. macro risk), possibly through a relative performance evaluation (Dewatripont & Legros, 2005:5).

According to the information above, it is the private partner that is expected to solely absorb the financial risks and this form of PPP arrangement can significantly improve the private partner's bottom-line as they bear more or the entire financial risk and are therefore likely to demand a greater remuneration package from the government as a result of having to assume major risks (Dewatripont & Legros, 2005:133). However, this research study advocates for the financial risk to be equally shared between SANRAL and the concessionaires to significantly increase SANRAL's revenue stream from the toll roads concessions and to enable it to have more leverage in the decision-making process. Over time, SANRAL has gained the necessary expertise to raise project finance from lenders. Project finance, as opposed to corporate finance, is the financing technique where the repayment of the project loan is limited to a great extent by the revenue generating capacity of the assets being financed (Pardo, 2019:21). The financial risk is categorised into different measurement groups as discussed below.

7.5.1.1 Credit Risk

When SANRAL and the concessionaires share the financial risk equally, there is less chance of the SPV defaulting on its obligations in accordance with agreed terms. Traditional credit analysis looks at the company's balance sheet and income statements to evaluate if a borrower is generating adequate cash flow to service its debts (Kong, Tiong, Cheah, Permana & Ehrlich, 2008:876). There is a higher probability that the SPV's balance sheet and income statements will be healthy and will meet the terms and conditions of the funder's credit risk management. The goal of credit risk management is to maximise a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Although certain financial institutions and credit agencies have developed credit risk assessment models, these models mostly focus on the creditworthiness of an entire company rather than specific projects that may be funded 'off-balance sheet' via SPVs (Kong et al., 2008:876). These credit risk assessment models will subject both PPP partners (SANRAL and concessionaires) to be individually assessed rather than the SPV being assessed alone as the representative for both partners. There are at least two different schools of thought when it comes to the credit risk theoretical approach (Allen & Saunders, 2002; Zhou, 2001), and these are:

- the structural approach: the default probability analysis focuses on a company's value evolution; and
- reduced-form models: these focus on finding stochastic risk rates, in which the dynamics of default possibility are independent to the credit recovery rate and both have no bearing on a company's structural characteristics (Delapiedra-Silva, 2021:5).

Over and above the two school of thoughts mentioned above, an entity might also be exposed to the credit risks of other companies with which it has a close relationship. For example, a company may suffer losses if a major supplier or joint venture partner is unable to obtain finance to continue trading (Woods & Dowd, 2008:6). These situations should prompt SANRAL to scrutinise the balance sheets, income statements and cash flow of potential private partners if the existing toll road concession contracts are extended or new private partners sourced.

7.5.1.2 Bankruptcy Risk

Bankruptcy is a collective process for creditors to recover debts, as well as a protection for individuals who have become overburdened by debts (Wood, 1995:Preface). Horváthová and Mokrišová (2018:2) further state that bankruptcy implies a risk emanating from the company's inability to fulfil its debt obligations. The reason this study proposes the 50/50 financial risk-sharing between SANRAL and potential private partners for the next toll road concessions is to completely avoid or minimise the possibility of a concessionaire defaulting, which could lead to bankruptcy. Due to its severe social and financial effects, bankruptcy is a crucial issue for businesses (Wu, 2010). Hence, SANRAL should do everything in its power to protect future concessionaires from bankruptcy exposure to ensure that the social infrastructure is protected.

Lenders use the bankruptcy forecasts or predictions (such as the option theoretical approach, statistical approach and accounting analytical approach) in order to reduce the probability of poor service to loans (Becchetti & Sierra 2002). For this reason, SANRAL, future concessionaires and the SPV should be subjected to these three bankruptcy approaches to ensure that the next toll roads concessions do not enter into any bankruptcy arrangement with lenders. The statistical approach uses four well-known methodologies that use balance sheet ratios to measure a company's risk for failure. These are linear or quadratic discriminant analysis, logistic regression analysis, profit regression analysis and neural network analysis (Horváthová et al., 2018:3). Therefore, the fundamental issue with bankruptcy prediction models is that they cannot be generalised since they were constructed using a specific sample from a specific time, specific sector and from a specific country or region (Bărbuță-Misu & Madaleno, 2020:2).

7.5.1.3 Cost and Schedule Overrun Risk

This risk emanates from management practices resulting in bad co-ordination with suppliers, inefficient construction practices, default on the part of suppliers, delays in administrative approvals, land acquisition and geological conditions (Checherita et al., 2007:5). Under the IFMOT model, SANRAL and future concessionaires should mitigate this type of risk for future concession contracts because this risk has long-

term financial implications for PPP projects. Such risks will also influence the financial terms throughout the operating (Checherita et al., 2007:5).

7.5.2 Design Risk

The design risk which forms part of the improvement phase in the IFMOT model is to be equally shared (50/50) between SANRAL and the concessionaires but only if the existing concession contracts are extended or new private partners are found. Inadequate soil analysis, design delays, inconsistencies and ambiguities in design and design modifications are all part of design-related risks (Shen et al., 2006:590). PPPs are seen as a solution to minimise design-related risks and to increase quality and the rate of innovation. Vital to the encouragement of innovation is the premise that when the design risk is transferred in a PPP project this offers an incentive for better design and design quality (Raisbeck, 2009:239). However, the design and other IFMOT project phases have a downside. For example, technical risks might influence the project's outcome during the design and construction phases (Checherita et al., 2007:4). To mitigate this undesirable outcome, the contractors and those in charge of completing a PPP project should use the initial design as the primary means through which the contractor may meet the client's fitness for purpose requirements as set out in the brief (Gruneberg, Hughes & Ancell, 2007). Below is a discussion on how the design risk affects the entire PPP life cycle.

- These requirements are frequently not fully or completely tested or known until the facility enters the operational phase and any mismatch or misalignment between the initial brief and the design may result in higher operating costs;
- With changes in the business environment, the design will also determine how easy the facility can adapt to changes in the future and the facilities functions may be increased or modified in order to maximise operational revenues; and
- Furthermore, the facility's overall design, including its conceptual design, as well as the way it organises and integrates services, will have an influence on the facility's future success (Raisbeck, 2009:239-240).

Based on the above information, the faults or errors due to design are sometimes not noticed until the implementation takes place during the operating phase. Therefore, during the 'improve' phase of the IFMOT model, in which the design takes place,

SANRAL and the concessionaires should ensure that there is clarity during the initial brief and design. The design in its current form is able to adapt to future changes, which is positive for the toll road concessions if the existing concession contracts are extended or new private partners are allocated.

7.5.2.1 *Design Error or Fault Risk*

This type of risk can develop when untested technical advances or innovations are specified in the tender documents or an already existing or established technology is proposed for a new application (e.g. new location) (Checherita et al., 2007:5). In the case of a DCFOM model, the design error or fault risk would be shifted to the contractor and the owner will have no obligations to the contractor (Prieto, 2012:3). However, under the proposed model (IMFOT), design error or fault risk would be shared equally by SANRAL and the concessionaires. Therefore, SANRAL and the concessionaires should minimise errors and faults as much as possible in the preliminary phases of the toll concessions if the existing concession contracts are extended or new private partners are found. Inadequate design and engineering work in the project's initial stages can induce risks in all subsequent phases, with regard to performance, compatibility and demand risk (Checherita et al., 2007:5). The next section discusses types of project finance that SANRAL and concessionaires can tap into in order to raise finances should the current toll road concession contracts be extended or new private partners allocated.

7.6 PROJECT FINANCE FOR PPPS

Some essential infrastructure projects in developing nations fail to take-off or are never completed due to a lack of project finance (Tshehla & Mukudu, 2020:50). The toll road concessions examined in this study have managed to take-off under their current contracts, and in the next six to nine years they will be completing their 30-year concession periods. However, after their current contracts have expired, they will have to restart the process and reapply for project finance with current or new private partners, and if the government decides to extend the contracts, it should be under the IFMOT model. Project finance is the process of funding a specific economic unit that the government creates, in which creditors share much of the venture's business risk and the capital is obtained strictly for the project itself (Pinto, 2017:200). The project

and infrastructure financing differs from other types of funding in three crucial ways, and these are as follows:

- The funded asset is a long-term capital asset;
- The project's sponsors form a SPV and become its major shareholders and separates the project from the public and private sector balance sheets; and
- due to the SPV being a stand-alone legal organisation, its debt is structured without recourse to the sponsors, thus safeguarding their creditworthiness (Walter, 2016:57).

From the above information, for its next toll road concessions, the government, as the project sponsor, should remain a part of the SPV but this time with an increased stake in the shareholding structure since it will be assuming 50% of the financial and design risks. To ringfence and protect, the SPV's balance sheet should be separated or deconsolidated from the balance sheets of SANRAL and the concessionaires since it is the standalone legal entity and these toll road concessions examined should adopt the non-recourse debt approach. In the event where the project's debtholders are also the parties best positioned to control the project's risk, it is apparent that the debt should be in the form of non-recourse debt (Brealey, Cooper & Habib, 1996:12). Below are several types of project finance which the toll roads concessions can access for funding in the future using the IFMOT model.

Table 7.1: The Role of Project Finance in PPPs

Type of Finance	Countries	Usage	Advantage	Disadvantages
Loan or grant finance directly from government to project company	United States, India	- Governments may offer funding to a PPP directly in the form of upfront grant subsidies or loans. - Credit assistance is usually provided on flexible terms and in a subordinated position, making it simpler to attract more private debt (United States, 2010:Chapter 4).	- These are essential for project viability when revenue projections indicate that the project will not be financially viable without government financing. - Capital contributions can also minimise the project's costs to government by allowing for better financing arrangements than would otherwise be possible.	Government ownership can result in a conflict of interest with its regulatory function, and private investors may be concerned that the government will be inclined to meddle in the management of the PPP contract inside the SPV.
Government provision of SPV equity	United Kingdom, France, Regional Government of Flanders in Belgium	Treasury may contribute a minority share of equity in PPP projects.	- The aim is to provide the government with easier access to project information, including financial performance of the project company. - Allows the government to have a greater say in strategic decisions. - Improves value for money by sharing in continuous investment returns.	The government bears more risk under PPPs.

Type of Finance	Countries	Usage	Advantage	Disadvantages
Forfaiting structures	Germany, France, Peru	-A financing structure that is occasionally utilised to minimise the cost of finance for PPPs is the forfaiting model, which can be used for government-pays PPP projects. - Because government payments are no longer conditional on the private operator fulfilling performance goals, the lender has less interest to ensure project performance.	- The project's finance costs may be reduced as a result of this. -Once construction is satisfactorily completed, the government provides an irreversible commitment to pay a portion of the contract costs to the project company, usually enough to service the debt, - As a result, once the infrastructure is constructed and operational, the government payments are unconditional and can be used to repay some or all of the PPP project company's debt.	Occasionally subjected to political pressure, which might compromise the quality and due diligence or project structuring.
Development bank or other state finance institution involvement in PPPs	Brazil	Where these firms operate as commercial financing institutions, they may be better positioned than the government to analyse the viability of a proposed PPP project.		Improper use of guarantees can raise the government's fiscal exposure and lower value for money by mitigating risk transfer to the private sector. Farquharson, de Mästle, Yescombe and Encinas (2011:63) allude that the guaranteeing of project debt hinders the risk transfer to the private sector. As a result, governments frequently only give partial credit guarantees, and that is a guarantee on repayment of only a portion of the total debt.
Government guarantee of a commercial loan for a project	Korea, Kazakhstan	Rather than providing direct loans, governments might guarantee repayment of debt sourced from commercial sources in the event that the private party defaults.	The utilisation of government guarantees should be carefully considered and should only be used to cover risks that the government is best equipped to manage.	

Source: IBRD (2017:49-53)

According to Table 7.1, there is an acknowledgement that by sharing the financial risk with private partners, the government will inherit more risk with more benefits. Again, the above information indicates that various local, regional and international financial institutions are able to finance PPP projects by relying on government guarantees, balance sheets, income statements and statements of cash flow. Despite the fact that their reliability and trustworthiness has been questioned due to extremely large-scale accounting scandals, a companies' balance sheets, income statements and statements of cash flow are still the most used sources to analyse the entity's performance (such as Enron in 2001 and Worldcom in 2002) (Truica & Trandafir, 2009:214). By sharing the financial risk and providing the necessary information (government guarantees, balance sheets, income statements and statements of cash flow) to the lenders, SANRAL and the concessionaires should qualify for project finance. Before finalising the funding arrangements, the financial provider will thoroughly examine the consortium's plans and financials for the project (Shen et al., 2006:591). However, providing late and inaccurate accounting information could compromise the very existence of toll road concessions in the future. According to Altman, Sabato and Wilson (2010:17), the late filing of accounts may be the result of a disagreement between auditors and directors over the 'true and fair view' of a firm's finances, or it may be the result of an intentional managerial decision in the case of companies facing financial difficulties because they do not want to publish unfavourable information, a by-product of the financial difficulties a firm may be facing.

From Table 7.1, sharing the financial risk between SANRAL and the concessionaires in the future will enable SANRAL to participate in the procurement process and this could lead to conflicts of interests. To mitigate conflicts of interests with SANRAL's regulatory function, a unit independent from the procurement authority manages equity shareholdings in the form of the National Treasury (IBRD, 2017:50). Lastly, Table 7.1 indicates that in securing project finance for PPP projects, the government should do a thorough feasibility study to avoid inappropriate use of guarantees which might lead to reduced value for money and fiscal exposure.

7.7 BEST PRACTICES FOR TOLL ROAD CONCESSIONS

The discussions below revolve around the most critical best practices for toll road concessions.

7.7.1 Accountability

Accountability is referred to as an agent's obligation to the principal by accounting for the activities performed on the principal's behalf (Whitty, 2008:1). In the context of this study, the concessionaires are to give a report to SANRAL accounting for the toll road concessions. It is expected that SANRAL will then take this report to all stakeholders including the public. Therefore, accountability is found to offer justifications or explanations for the performance and actions of a concessionaire to the stakeholders to whom the organisations are held accountable (Boiral, 2016). These justifications or explanations and actions by the concessionaires regarding the toll road concessions form part of a formal arrangement between them and SANRAL. The accountability is based on a formal agreement that gives the agent authority to act on behalf of the principal and empower the principal to demand that the agent render an account (Whitty, 2008:1). This formal agreement increases the chances of realising public or social service delivery targets, which in turn eliminates or minimises the rate of corruption which compromises services such as safe and good toll road conditions for citizens. From the perspective of public service delivery, the contextual expression of accountability has sparked a discussion over whether accountability serves the interests of the general public or promotes the hidden interests of particular groups or individuals (Khanal, 2016:65). It is necessary for the concessionaires and SANRAL to give an account of their activities to the public at large and all other stakeholders.

7.7.2 Transparency

Transparency as a best practice cannot be ignored in the PPP arrangement. Therefore, the degree to which all stakeholders have a mutual understanding of, and access to, all required information without noise, loss, delay or distortion is known as transparency (Papenfuß & Schaefer, 2010). In this sense, transparency refers to the government's disclosure of information to external stakeholders to enable the stakeholders to monitor the government's and the concessionaires' activities (Lyrio, Lunkes & Taliani, 2018:3). In the context of this study, SANRAL and the

concessionaires decide which information is to be shared with the general public. The PPP often decides the scope and quality of information presented and published in an annual report (Reich, 2018:242). As a result, some of the critical information, such as profit and losses, required by the public is often not provided or missing in the annual report for toll road concessions. The missing information in the annual report usually results in SANRAL and lobby groups arguing over the missing information. An example of this is the dispute between SANRAL and OUTA, where the court of law ruled in favour of OUTA in 2021 in the access to information case. SANRAL and the concessionaires should be disclosing information to all stakeholders as a matter of principle. The public are also stakeholders, therefore, when PPP partners are disclosing this information, the public must be considered.

7.7.3 Benchmarking

Benchmarking is a process by which organisations look beyond their immediate precincts in order to learn and improve (Krishnamoorthy & D'Lima, 2014:2). Sekhar (2010:882) further alludes that benchmarking is a strategy for comparing an organisation's performance to that of its competitors in order to determine the best practice and take the required steps to improve performance to meet or exceed that of its competitors. As a consequence, SANRAL and the concessionaires should learn from other countries by copying best practices as a form of benchmarking in order to improve their performance on toll road concessions, and most importantly, the concessionaires should benchmark amongst themselves. Copying best practices as a form of benchmarking does not imply imitation (Horváthová, Mokrišová & Vrábliková, 2021:1). The three concessionaires examined for this study can also learn or borrow best practices from each other in order to set benchmarks. Borrowing innovative technologies and techniques for applying best practices from other successful organisations is considerably easier and more effective (Goncharuk, Lazareva & Alsharf, 2015:27). The proposed model will be able to improve the PPPs in road infrastructure in South Africa because the model encourages the concessionaires to make comparisons amongst themselves and with other international concessions.

7.8 CHAPTER SUMMARY

In this chapter, the relevancy of sharing financial and design risks equally between the government and the private sector was thoroughly discussed. However, the sharing of financial and design risks equally is only proposed if the current toll road concession contracts are extended or new private partners are found at the end of the concession period. The IFMOT model is proposed for these concessions in the future because of its relevancy to the already existing PPP projects. The project finance types were discussed in detail as possible funding sources for future toll road concessions and the relevant best practices for the toll road concessions were also discussed. The next chapter provides the conclusion and recommendations for this study.

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

The previous chapter established that the government has not yet made a decision regarding the extension of the toll road concessions examined for this study. A PPP model to use for these toll concessions in the future was also proposed. This chapter presents the conclusion and discusses the effectiveness of PPPs in the development of the toll road infrastructure in SA based on the research findings and theoretical perspectives. This chapter is further divided into sections as follows: recommendations, limitations of the study, implications of the research findings and proposition for future areas of research.

8.2 CONCLUSION

The researcher conducted interviews, reviewed documents and observed the reality on the ground to address the research objectives of this study. All these efforts were undertaken to determine the effectiveness of PPPs in the development of toll road infrastructure in SA. The responses expressed by the participants and documents analysis significantly addressed the research objectives.

Research Objective 1: To identify the challenges facing SANRAL and concessionaires in terms of the PPP model in use on the toll road concessions investigated for this study.

Technical expertise or political influence contributed to the selection of the DCFOM model.

The DCFOM model is based on traffic volumes and this makes the toll road concessions vulnerable in that the engineers can either overestimate or underestimate when predicting traffic volumes. The adverse consequences of overestimating or underestimating can lead to the debt not being appropriately serviced as less traffic results in fewer toll collections and more traffic than anticipated results in more maintenance work being required than was forecasted. Either way the result in less revenue for the concession.

In terms of the DCFOM model, the disadvantage of traffic overestimation or underestimation is that the government does not take the demand risk shortfall in this instance as only the private sector is exposed to the demand risk shortfall. This compromises the private sector in that they are the ones that have borrowed finance from lenders in order to construct the toll road concessions and then use the revenue generated by toll fees to pay back the debt while at the same time being expected to make a profit.

Since the DCFOM model is based on traffic volumes, all types of vehicles are allowed on the toll roads concessions investigated. However, this model benefits heavy vehicles such as trucks, since they cause more damage to the toll roads while paying less. These damages inflicted by heavy vehicles require routine maintenance which result in unbudgeted costs.

Research Objective 2: To review best practices of toll road infrastructure that SANRAL can adopt.

Accountability: To satisfy the requirements of accountability, it is expected for the concessionaires to give a report to SANRAL accounting for profits, losses, maintenance plans, operations, road conditions, construction, etc. It is upon SANRAL to verify the legitimacy of the information before reporting it to all relevant stakeholders, which includes the public. Therefore, upon reporting to stakeholders, it is expected that SANRAL and the concessionaires will be held accountable to every detail of the report. The report will give insight to the performance of SANRAL and the concessionaires for the toll road concessions and provide justifications or explanations as to their performance.

Transparency: Transparency in this context refers to the disclosure of information by SANRAL and the concessionaires to external stakeholders (which includes the public) in order to empower all stakeholders to monitor the activities of SANRAL and the concessionaires regarding toll road concessions.

SANRAL and the concessionaires should ensure that all information shared with stakeholders is detailed and accessible and without any distortion. However, often the reality is that the PPP information made available to the external stakeholders

(especially the public) is not complete. This is the major cause of disputes between the government and the general public in SA because the public perceives the toll road concessions as being secretive since the information contained in annual report lacks detail.

Benchmarking: In order for SANRAL and the concessionaires to remain relevant and competitive they must benchmark their activities and processes. In the context of this study, the three concessionaires should do a comparison amongst themselves to improve their performance. Most importantly, the concessionaires should compare themselves with other toll road concessions in other countries as a means of learning and copying best practices. However, there is information deemed privileged (intellectual property) which cannot be shared with other concessionaires. The downside of this is that the concept of benchmarking is stifled and defies the logic for performance improvement through benchmarking. It should be noted that deeming certain information as privileged is not illegal and is done to protect an organisation's intellectual property.

Research Objective 3: To examine the nature of the contractual agreement that regulates the partnership between SANRAL and the concessionaires for the toll road concessions examined for this study.

It was assumed that SANRAL conducted a feasibility study to ensure that the concession agreements satisfied all the VFM requirements and that SANRAL could afford to enter into these agreements before they signed any of the contractual agreements for the toll road concessions investigated for this study. SANRAL is empowered by legislation to conduct feasibility studies and is deemed capable to produce such a study.

Based on the contractual agreement, the DoT and the National Treasury can support SANRAL by playing an oversight role. SANRAL is empowered by legislation to monitor the performance of the concessionaires for the toll road concessions. Therefore, it is worth mentioning that SANRAL, as a government agency, is the only organisation permitted to conduct monitoring as a means of satisfying these contractual agreements.

Under the conditions and terms of the current PPP model in use, which forms part of the contractual agreement, the concessionaires are expected to design, construct, finance, operate and maintain the toll road concessions. Any disputes arising from non-compliance of the aforementioned activities should follow a specific dispute resolution process which is clearly defined and outlined in the contractual agreement.

Research Objective 4: To propose a suitable model for toll road concessions going forward.

The reason for selecting the DCFOM PPP model currently in use is because the government did not have enough funds to rollout the toll road infrastructure on its own, hence the invitation to the private sector. Therefore, the government transferred all of the risks and the costs for the overall toll road infrastructure onto the concessionaires.

However, this study proposes the adoption of the IFMOT model for these PPPs when at the end of their concession contracts. This can only happen if the existing concession contracts are extended, or new private partners are found. The decision to extend or find new private partners lies with the National Treasury, DoT and SANRAL. The IFMOT model will enable SANRAL and the concessionaires to share the design and financial risks for the toll road concessions.

8.3 RECOMMENDATIONS

8.3.1 Recommendations on Conflicting Statements about the PPP Model Currently in Use

It was discovered from the interviews that the DCFOM model had been adopted for toll road concessions rather than the DFBOT model. According to the National Treasury (see Table 1.1), the toll road concessions adopted the DFBOT model. However, during the interviews held with both SANRAL and the concessionaires (see par. 6.3.2.3(b) and par. 6.3.2.3(c)), it was established that the DCFOM model is used for the toll road concessions examined for this study.

The above conflicting information by the National Treasury and SANRAL regarding the model in use raises some serious concerns as to the level of collaboration between these two government institutions. Another concern relates to how often the National Treasury, Department of Transport, SANRAL and the concessionaires hold one-on-

one meetings to resolve issues of concern regarding the toll road concessions. Since regular meetings and consultations basis could have resolved this issue long ago.

8.3.2 Recommendations for a Proposed PPP Model that can be Used in the Future for the Toll Road Concessions Investigated

The study proposes the adoption of the IFMOT model if the existing concession contracts are extended or new private partners are allocated at the end of the current concession period. The IFMOT model is relevant in that the infrastructure at the toll road concessions examined for this study already exists and in good condition with no need to construct the infrastructure from scratch.

Under the IFMOT model, this study also proposes a risk-sharing structure in which the government, through SANRAL, can share the financial and design risks with the private sector on an equal basis (50/50). In the current model, the private partners bear all the risks (design, build, finance, operate and maintain) and they benefit more because of the risks they have taken. As a result of allowing the government to take equal risks (i.e. design and financial risks) to that of the private partners will enable the government to significantly benefit from the toll road concessions.

8.3.3 Recommendations for Compliance and Implementation of Existing Policy, Regulatory and Legislative Frameworks for PPPs

The concerns regarding the lack of public participation in the establishment of the GFIP were registered by several of the participants as they felt that there was not proper consultation with the government and SANRAL regarding the establishment of the GFIP. For this reason, if existing concession contracts are extended or new private partners are found at the end of current concession period, there should be proper public participation and consultation and all relevant stakeholders should be included in this process and this includes the general public. To foster partnerships, the PFMA (Regulation 16 of 1999) and the PPP Manual should include a provision to guarantee the legitimate interests of all stakeholders including the public and other interest groups (Fombad, 2014:84).

In the context of this study, the equal sharing of design and financial risks between SANRAL and the concessionaires will enable SANRAL to actively participate in procurement decisions, and as a consequence, the PFMA (Regulation 16 of 1999)

and the SANRAL and National Roads Act, No. 7 of 1998, will require slight changes in order to accommodate this proposed new PPP model since the PFMA (Regulation 16 of 1999) advocates for risk to be transferred to a private partner. Therefore, it is necessary for lawmakers to effect these changes or amendments if the existing concession contracts are extended or new private partners are allocated at the end of current toll road concession periods.

In terms of the SANRAL and National Roads Act, No. 7 of 1998, the participants complained that it gives SANRAL too much power and enables SANRAL to become a player and referee at the same time. Therefore, there should be a clear distinction between the role of a SOEs and that of the PPP unit (National Treasury) in matters relating to PPP arrangements in order to avert conflicts of interests.

Some of the concessionaires did not familiarise themselves with the Spatial Planning and Land Use Management Act, No. 16 of 2013, on the grounds that their concessions were concluded before the Act was promulgated. However, this study indicates that it is necessary for the concessionaires to familiarise themselves with the contents of the SPLUMA, especially Section 25(1)(c) and (d) despite the SPLUMA being enacted after the finalisation of their concession contracts.

8.3.4 Recommendations for Parliamentary Oversight Over the Toll Road Concessions Examined

With regard to the parliamentary oversight role, the Portfolio Committee on State-owned Enterprises and the Standing Committee on Public Accounts do not have the capacity to analyse financial statements and the annual audits provided by the Auditor-General for the toll roads concessions. Consequently, they should be empowered by collaborating with the Standing Committee on Finance in order to increase their capacity. Another key factor to be considered is to make these committees more effective in their oversight role and to involve them from the first phase till the last phase of the PPP process to ensure value for money and a return on investment. Currently, only the executive authority participates in ensuring VFM from the first to the last phase of the PPP arrangement. Another obstacle hampering the effectiveness of these committees for monitoring the PPP projects is that the executive is reluctant to go to parliament and is not taken to task for this. Therefore, this brings into doubt whether the monitoring, review and overseeing of SANRAL's strategic and business

plans for PPP arrangements and the toll roads subsector in general are diligently accomplished.

8.3.5 Recommendations for Design, Financial and Infrastructure Functions for the Toll Road Concessions examined

If the SA government (N3 and N1N4) and the Mozambican government (N4) decide to extend the current toll road concession contracts or enter into completely new toll road concession contracts with new private partners at the end of the current contracts, then this study suggests that SANRAL and the concessionaires should share the design and financial functions on an equal basis under the IFMOT model. By sharing the design and financial functions, SANRAL will be in a position to increase its benefits and also increase its role in decision-making. The revenue generated from the design and financial functions could contribute immensely towards the government's reserves since the government is currently financially overburdened.

In terms of infrastructure functions, the operation, maintenance and rehabilitation for the toll road concessions investigated are better managed by the concessionaires. These functions require immediate attention without delays for the toll road concessions. As a result, the PFMA, Regulation 16 of 1999, does not limit the concessionaires to perform these functions in that the traditional procurement process is not followed in order to allow the concessionaires to act swiftly and immediately in the execution of these functions (operation, maintenance and rehabilitation). Therefore, if the existing concession contracts are extended or new private partners are found at the end of the current concession period, SANRAL should be exclusively empowered to oversee the execution of operation, maintenance and rehabilitation functions performed by the concessionaires on SANRAL's behalf.

8.3.6 Recommendations for Road Safety and Law Enforcement Along the Toll Road Concessions Investigated

The evidence has shown an increase in the number of incidents occurring along the toll road concessions examined. The blockade of the N3 highway by truck drivers in early December of 2021 between Van Reenen's Pass and Tugela Toll Plaza, the burning and looting of trucks along the N3 during the July 2021 unrest, high traffic volumes during holiday seasons and high accident rates and road infringements are all contributing factors to a high number of incidents on the toll road concessions

examined. For this reason, it is necessary to establish a special police force that is dedicated to deal with all these transgressions if the existing concession contracts are extended or new private partners are found at the end of current concession period. The establishment of this special police force will reduce the burden of the South African Police Services (SAPS), South African National Defence Force (SANDF) and the national, provincial and local traffic forces. Therefore, there must be a legislative provision that enables this special police force to deal with rioters, traffic blockades, protests, traffic infringements and other forms of crimes on the toll road concessions. The formation of this special police force is critical to the protection of the toll road concessions because they are national key points that drive the economy, enable leisure traveling, etc.

8.3.7 Recommendations for Toll Road Collection for the Toll Road Concessions Examined

The traffic congestion discussed above can create bottlenecks at the toll road gantries leading to long queues. In remedying, or at least easing these bottlenecks, toll road collection methods such as electronic toll collection, open road tolling and all electronic tolling were introduced. These payment methods enabled toll road users to make payments electronically as a way of easing congestion at the gantries.

However, the majority of toll road users do not take advantage of these technologies and this defies the logic of reducing congestion at the gantries. Therefore, the toll road concessions examined for this study should intensify their messaging regarding e-tags. The campaigns should be taken to regular toll road users such as taxi associations, road freight associations, civil society, etc.

8.3.8 Recommendations for Maintaining Infrastructure on the Toll Road Concessions Investigated

The ageing infrastructure on the toll road concessions is deteriorating due to the ever-increasing traffic volumes and heavy-duty vehicles (trucks). And if this deteriorating and ageing infrastructure is not dealt with immediately, unplanned stoppages will occur, resulting in unnecessary costs for the concessionaires. Therefore, this study proposes that infrastructure maintenance, such as routine, periodic and emergency maintenance, should remain the responsibility of the concessionaires when working under the IFMOT model since these private entities are not limited to the PFMA in the

SA context. This strategy will enable maintenance to be expeditiously implemented on the toll roads.

8.3.9 Recommendations for Value for Money

The feasibility study should be able to determine whether there is VFM on the future toll road concessions and SANRAL should perform the feasibility study on behalf of the government in order to determine the VFM. As a consequence, the decision to extend the current toll road concession contracts or enter into completely new toll roads concession contracts with new private partners should be informed by VFM. In ensuring VFM in the future for toll road concessions under the IFMOT model, operation, legal, technical, scheduling and economic feasibility studies should be undertaken.

8.4 LIMITATIONS OF THE STUDY

This study was conducted during a period in which the tensions were high in SA with regard to the tolling system. This was due to the public opposition to the GFIP which had a spill-over effect, although minimal, onto the toll road concessions examined for this study.

The implementation of toll road concessions examined began between the late 1990s and early 2000s, and during this period, the activism against toll fees was minimal. However, during the implementation phase of the GFIP in 2011, the public uproar gained traction which eventually frustrated the government's plans regarding this concession. The most prominent dissatisfaction cited was a lack of public consultation and participation.

The above context made the organisations identified for the research interviews sceptical to participate. This situation prompted the researcher to allay the concerns of some of the participants, and this process took some time. The researcher had to explain to participants that this research study had no ulterior motives and was purely an academic exercise intended to contribute to a body of knowledge.

The COVID-19 pandemic contributed to the use of electronic online calls (Zoom) for the collection of data during the interviews. The use of Zoom in the data collection posed some challenges, such as network disruptions. These network disruptions

would in some instances require the researcher to ask the participant to repeat themselves. Secondly, the COVID-19 pandemic made it difficult for the researcher to meet the participants in person.

8.5 IMPLICATIONS OF RESEARCH FINDINGS

8.5.1 Policy Implications

One of the challenges of the policy and legislation that govern toll road concessions in SA is the policy indecisiveness. The policy indecisiveness on the Gauteng Freeway Improvement Plan toll road (GFIP) has resulted in SANRAL's dwindling finances due to revenue shortfalls. These revenue shortfalls are caused by the high rate of payment default, yet despite this, the government is not announcing its policy decision with regard to the GFIP. Furthermore, the decision regarding the GFIP has been postponed for years.

The dynamics around the GFIP have a direct impact on the toll road concessions examined, in that this study is advocating for SANRAL to share the design and financial risks with the concessionaires if the existing concession contracts are extended or new private partners are found at the end of current concession period. Under the current circumstances, SANRAL is overwhelmed financially because it has to honour its obligation of servicing the GFIP debt, even when the stream of revenue (toll fees) is too low or non-existent, until an alternative is found by the National Treasury. As a result, SANRAL's capacity to finance other projects is hamstrung by the government's indecisiveness to resolve the GFIP impasse.

8.5.2 Communication Implications

The broad population of society is not informed about the annual price adjustments of toll because often the coverage of the annual price adjustments is only displayed on SANRAL's and the concessionaires' websites, hence this information is not reaching a significant number of the toll road users. The informed users will know about the toll fee increase but the average user would not easily know until getting to the toll road gantries. Therefore, communication platforms such as radio, television, newspapers, varying internet sites, etc., are not being used to reach the broad population to prevent public resistance. Not every toll road user knows that the toll fees increase by the CPI

adjustment every year and even those who do know might not be able to apply the calculation correctly.

8.6 PROPOSITION FOR FUTURE AREAS OF RESEARCH

The DCFOM model is perceived as a one size fits all approach with regard to toll road concessions. Despite the various PPP models mentioned in chapter four, SANRAL has decided on a single model. As result, this study proposes a research study be undertaken to search for differentiated, individualised and suitable models for each toll road concession. Attention should be given to the needs, requirements and circumstances of the individual toll road concessions when developing or proposing these differentiated, individualised models.

The consultation process is one of the contentious issues that impedes progress in the toll road subsector in SA. The public often feels excluded in the decision-making process for the establishment of toll roads and especially for toll road concessions. Therefore, a research study in the effectiveness of public participation in the toll road concessions would be appropriate in order to avert public resistance (i.e. the GFIP) in current and future toll road projects. As a result, **transparency** and **accountability** should be assured.

The annual toll fee hike based on the CPI adjustment, the public resistance towards toll roads, dispute resolutions between SANRAL and the concessionaires, and infrastructure backlogs on toll roads are all matters requiring a dedicated regulatory body. All these issues necessitate a research study to focus on the possibility of establishing a regulatory body for the toll road subsector and related issues.

Politics and technical expertise are both critical to the successful implementation of PPPs (toll road concessions in this case). However, problems begin to show when one of the two invades the territory of the other, for example political tampering. As a consequence, a research study can be undertaken to establish the extent to which there is political tampering into PPP projects, as well as to find a way of not overwhelming the technical expertise.

8.7 CHAPTER SUMMARY

This chapter highlighted the importance of taking decisive policy decisions earlier rather than later in matters relating to toll road concessions. By not acting in time, the government compounded and prolonged problems for the GFIP, which then affected other toll road concessions. Again, it was indicated that SANRAL should improve its communication strategy, especially when announcing toll fee increases to the public.

In terms of infrastructure maintenance, this chapter highlighted that under IFMOT model, the toll road maintenance should remain the responsibility of the concessionaires since the PFMA does not limit the private sector in SA and maintenance will be rolled-out more expeditiously. The establishment of a dedicated police force to lessen the burden of the SAPS, SANDF, national, provincial and local traffic forces for the toll road concessions was also discussed. With regard to oversight, it was recommended that the Portfolio Committee on State-owned Enterprises and the Standing Committee on Public Accounts should work together with the Standing Committee on Finance in order to increase their capacity for analysing the financial statements and annual audits provided by the Auditor-General for the toll road concessions.

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ANNEXURE 1: INTERVIEW GUIDE

Government Departments

My name is Thabo Borole pursuing a PhD in Public Management and Governance at North West University, Vaal Triangle Campus in South Africa. My thesis is entitled **“The effectiveness of Public Private Partnerships in the development of road infrastructure: The case of toll road concessions in South Africa”**. This study aims at identifying the most appropriate PPPs Model for infrastructure development of toll road concessions in South Africa. The participants of this study include members of National Treasury, Department of Transport (DoT), SANRAL, N3 Toll Road Concession (N3TC), Trans African Concessions (TRAC), Bakwena Platinum Corridor Concessionaire (BPCC), and Opposition to Urban Tolling Alliance (OUTA).

You have been identified as one of the participants and kindly requesting for your time and cooperation to respond to the questions in this interview. Please note that this interview is voluntary and you may withdraw at any time especially if you feel the study is causing any mental, emotional or physical harm. The researcher will uphold and guarantee confidentiality and anonymity (use of pseudo names on subjects). The information gathered from the participants will be used for academic purpose only and the responses will be kept for five-year duration as stipulated by the University.

Date: _____

Time: _____

Location: _____

Name of Interviewer:

Interviewee:

Gender: _____

Age: _____

Highest Education qualification: _____

Number of years worked in the organisation: _____

Notes to interviewee:

- Thank you for your participation. I believe your input will be valuable to this research
- Your input will also help South Africa achieve more from of adoption of PPPs in the toll road concessions.
- Confidentiality of participants is guaranteed
- Approximately length of interview: 60 minutes.

Your participation will be greatly appreciated.

1. Interview questions on compliance and implementation of existing policy, regulatory and legislative framework

- 1.1. What is your understanding of the term PPP from the regulatory point of view?
- 1.2. Do you think the regulation and manual (such as Public Finance Management Act, 1999 (Regulation 16 of 1999) and PPP Manual) governing the PPPs on toll road concessions in South Africa are sound and adequate?
- 1.3. Do you think SANRAL and Concessionaires adhere to the SANRAL and National Roads Act, 1998 (Act 7 of 1998) in terms of managing and controlling toll roads in SA?
- 1.4. Can you state problem areas of policy and legislation that govern toll roads concessions in SA?

2. Interview questions on PPPs Unit's responsibilities with regard to the management of PPP's agreements in SA

- 2.1. Does your unit adequately monitor and regulates the implementation of, and review of performance compliance in terms of PPPs agreement?
- 2.2 As a government department, are you adequately resolving disputes and differences with the private party on matters relating to PPPs agreements?
- 2.3. Can you provide examples of disputes and differences that you usually deal with?
- 2.4 Does your unit oversee the day-to-day management of the PPPs agreement?

3. Interview questions on the issues behind the adoption of DFBOT model

- 3.1. Based on your assessment, do you think technical expertise or political influence played any role in the selection of DFBOT model to the three road concessions under investigation?
- 3.2. In accordance to your experience, can you mention strengths and weaknesses of the DFBOT model in relation to your Concession?
- 3.3. Can you state the policy and regulatory reasons that prompted the adoption of a single model for all three toll road concessions under investigation?
- 3.4. Based on your experience, which individualised model would you prefer for your Concessionaire?

4. Interview questions on contracting PPPs agreements

- 4.1. Based on your assessment, do you think your unit ensures PPPs agreements under study provide value for money?
- 4.2. As a unit within government department, have you ensured the smooth transfer of appropriate technical, operational and financial risk to the Private Party (Concessionaires) for PPPs agreements under investigation?
- 4.3. As a unit of government department, have you done a due diligence to ensure that SANRAL can afford to enter into the Concessions under examination?

5. Interview questions on PPPs Concessions on infrastructure development for toll roads in South Africa

- 5.1. In terms of road maintenance, do you think SANRAL and Concessionaires are properly embarking on routine, reactive, periodic, special and development works toll roads under investigation?
- 5.2. In your view, does SANRAL and Concessionaires build access roads that feed into the toll roads under examination in order to improve access to markets and business centres?
- 5.3. According to you, does SANRAL and Concessionaires build Public Transport Facility Improvements along the toll roads under study in order to improve mobility and safety?

- 5.4. In servicing the ageing infrastructure on toll roads under investigation, do you think SANRAL and Concessionaires have invested enough in terms of finance and other resources?
- 5.5. In terms of infrastructure development, can you mention any weaknesses and strengths that SANRAL and Concessionaires are experiencing?
- 5.6. Do you think SANRAL is in good standing in terms of credit rating in order to be able to afford the rollout of toll road infrastructure?
- 5.7. Do you think SANRAL and Concessionaires manage and maintain the toll road infrastructure effectively and efficiently?

ANNEXURE 2: INTERVIEW GUIDE

Government Agency and Concessionaires

My name is Thabo Borole pursuing a PhD in Public Management and Governance at North West University, Vaal Triangle Campus in South Africa. My thesis is entitled “**The effectiveness of Public Private Partnerships in the development of road infrastructure: The case of toll road concessions in South Africa**”. This study aims at identifying the most appropriate PPPs Model for infrastructure development of toll road concessions in South Africa. The participants of this study include members of National Treasury, Department of Transport (DoT), South African National Roads Agency (SOC) Limited (SANRAL), N3 Toll Road Concession (N3TC – N3 Toll Road), Trans African Concessions (TRAC – N4 Toll Road), and Bakwena Platinum Corridor Concessionaire (BPCC – N1N4 Toll Road).

You have been identified as one of the participants and kindly requesting for your time and cooperation to respond to the questions in this interview. Please note that this interview is voluntary and you may withdraw at any time especially if you feel the study is causing any mental, emotional or physical harm. The researcher will uphold and guarantee confidentiality and anonymity (use of pseudo names on subjects). The information gathered from the participants will be used for academic purpose only and the responses will be kept for five-year duration as stipulated by the University.

Date: _____

Time: _____

Location: _____

Name of Interviewer:

Interviewee:

Gender: _____

Age: _____

Highest Education qualification: _____

Number of years worked in the organisation: _____

Notes to interviewee:

- Thank you for your participation. I believe your input will be valuable to this research
- Your input will also help South Africa achieve more from of adoption of PPPs in the toll road concessions.
- Confidentiality of participants is guaranteed
- Approximately length of interview: 60 minutes.

Your participation will be greatly appreciated.

1. Interview questions on compliance and implementation of existing policy, regulatory and legislative framework on PPPs

- 1.1. As SANRAL's personnel, what is your understanding of the term PPP from the principal's point of view?
- 1.2. Do you think the legislative and regulatory frameworks governing the PPPs on toll road concessions in South Africa are sound and adequate?
- 1.3. Does SANRAL adhere to policy, regulatory and legislative framework on PPPs particularly those on toll road concessions?
- 1.4. Can you state problem areas of policy and legislation that govern toll roads concessions in SA?

2. Interview questions on PPPs Concessions on infrastructure development for toll roads in South Africa

- 2.1. In terms of road maintenance, do you think SANRAL and Concessionaires are properly embarking on routine, reactive, periodic, special and development works toll roads under investigation?
- 2.2. In your view, does SANRAL and Concessionaires build access roads that feed into the toll roads under examination in order to improve access to markets and business centres?
- 2.3. According to you, does SANRAL and Concessionaires build Public Transport Facility Improvements along the toll roads under study in order to improve mobility and safety?

- 2.4. In servicing the ageing infrastructure on toll roads under investigation, do you think SANRAL and Concessionaires have invested enough in terms of finance and other resources?
- 2.5. In terms of infrastructure development, can you mention any weaknesses and strengths that SANRAL and Concessionaires are experiencing?
- 2.6. Do you think SANRAL is in good standing in terms of credit rating in order to be able to afford the rollout of toll road infrastructure?
- 2.7. Do you think SANRAL and Concessionaires manage and maintain the toll road infrastructure effectively and efficiently?

3. Interview questions on the issues behind the adoption of DFBOT model

- 3.1. Based on your assessment, do you think technical expertise or political influence played any role in the selection of DFBOT model to the three road concessions under study?
- 3.2. What approach is being used towards the adoption of the DFBOT model? Can you also elaborate on the process steps of this approach?
- 3.3. In ensuring the Critical Success Factor of DFBOT model, did you use both PPP product and project management success since the latter is rarely applied in most PPPs?
- 3.4. In accordance with your experience, can you mention strengths and weaknesses of the DFBOT model in relation to the three road concessions under investigation?
- 3.5. Based on your experience, which individualised models would you prefer for each road concession under examination?
- 3.6. As SANRAL, what role are you playing in determining the toll tariffs on toll road concessions in SA?

4. Interview questions on legal relationship between SANRAL and Concessionaires

- 4.1. As a SANRAL's personnel, do you think the Concessionaires are fulfilling their part of the contractual agreement?
- 4.2. Do you think the DFBOT model is assisting in easing the legal relationship of SANRAL and Concessionaires?

4.3. According to you, do you think the DFBOT model is encouraging high level of cooperation and teamwork between SANRAL and Concessionaires?

ANNEXURE 3: INTERVIEW GUIDE

Business, Civil Society Group and Trade Union

My name is Thabo Borole pursuing a PhD in Public Management and Governance at North West University, Vaal Triangle Campus in South Africa. My thesis is entitled “**The effectiveness of Public Private Partnerships in the development of road infrastructure: The case of toll road concessions in South Africa**”. This study aims at identifying the most appropriate PPPs Model for infrastructure development of toll road concessions in South Africa. The participants of this study include members of National Treasury, Department of Transport (DoT), South African National Roads Agency (SOC) Limited (SANRAL), N3 Toll Road Concession (N3TC), Trans African Concessions (TRAC), Bakwena Platinum Corridor Concessionaire (BPCC), and Opposition to Urban Tolling Alliance (OUTA).

You have been identified as one of the participants and kindly requesting for your time and cooperation to respond to the questions in this interview. Please note that this interview is voluntary and you may withdraw at any time especially if you feel the study is causing any mental, emotional or physical harm. The researcher will uphold and guarantee confidentiality and anonymity (use of pseudo names on subjects). The information gathered from the participants will be used for academic purpose only and the responses will be kept for five-year duration as stipulated by the University.

Date: _____

Time: _____

Location: _____

Name of Interviewer:

Interviewee:

Gender: _____

Age: _____

Highest Education qualification: _____

Number of years worked in the organisation: _____

Notes to interviewee:

- Thank you for your participation. I believe your input will be valuable to this research
- Your input will also help South Africa achieve more from of adoption of PPPs in the toll road concessions.
- Confidentiality of participants is guaranteed
- Approximately length of interview: 60 minutes.

Your participation will be greatly appreciated.

1. Interview questions on Corporate Social Responsibility

- 1.1. In fulfilling its developmental mandate, do you think SANRAL and Concessionaires are appropriately and adequately engaged in community outreach programmes?
- 1.2. According to you, does SANRAL and Concessionaires source material from local suppliers during the construction or maintenance of toll roads under investigation?
- 1.3. In your view, does SANRAL and Concessionaires transfer specific scarce skills to locals and workers during the construction or maintenance of toll roads under examination?
- 1.4. Based on your experience, does SANRAL and Concessionaires inform the community and workers of activities prior to their implementation?

2. Interview questions on toll tariffs

- 2.1. According to you, does the toll tariffs justified in terms of the road conditions and service provided to customers at the toll roads under study?
- 2.2. How does the toll tariffs affect the workers on daily basis?
- 2.3. In terms of messaging, does SANRAL and Concessionaires communicate effectively with workers on toll discounts, payments and adjustments?

3. Interview questions on PPPs Concessions on infrastructure development for toll roads in South Africa

- 3.1. In terms of road maintenance, do you think SANRAL and Concessionaires are properly embarking on routine, reactive, periodic, special and development works on toll roads under examination?
- 3.2. In your view, does SANRAL and Concessionaires build access roads that feed into the toll roads under investigation in order to improve access to workplace for workers?
- 3.3. According to you, does SANRAL and Concessionaires build Public Transport Facility Improvements along the toll roads under study in order to improve mobility and safety of workers?
- 3.4 In servicing the ageing infrastructure on toll roads under investigation, do you think SANRAL and Concessionaires have invested enough in terms of finance and other resources?
- 3.5. Do you think SANRAL is in good standing in terms of credit rating in order to be able to afford the rollout of toll road infrastructure?

ANNEXURE 4: INTERVIEW GUIDE

Political Parties

My name is Thabo Borole pursuing a PhD in Public Management and Governance at North West University, Vaal Triangle Campus in South Africa. My thesis is entitled “**The effectiveness of Public Private Partnerships in the development of road infrastructure: The case of toll road concessions in South Africa**”. This study aims at identifying the most appropriate PPPs Model for infrastructure development of toll road concessions in South Africa. The participants of this study include members of National Treasury, Department of Transport (DoT), South African National Roads Agency (SOC) Limited (SANRAL), N3 Toll Road Concession (N3TC), Trans African Concessions (TRAC), Bakwena Platinum Corridor Concessionaire (BPCC), and Opposition to Urban Tolling Alliance (OUTA).

You have been identified as one of the participants and kindly requesting for your time and cooperation to respond to the questions in this interview. Please note that this interview is voluntary and you may withdraw at any time especially if you feel the study is causing any mental, emotional or physical harm. The researcher will uphold and guarantee confidentiality and anonymity (use of pseudo names on subjects). The information gathered from the participants will be used for academic purpose only and the responses will be kept for five-year duration as stipulated by the University.

Date: _____

Time: _____

Location: _____

Name of Interviewer:

Interviewee:

Gender: _____

Age: _____

Highest Education qualification:

Number of years worked in the organisation:

Notes to interviewee:

Your participation will be greatly appreciated.

- Thank you for your participation. I believe your input will be valuable to this research
- Your input will also help South Africa achieve more from of adoption of PPPs in the toll road concessions.
- Confidentiality of participants is guaranteed
- Approximately length of interview: 60 minutes.

Your participation will be greatly appreciated.

1. Interview questions on compliance and implementation of existing policy, regulatory and legislative framework on PPPs

- 1.1. From a political point of view, do you think the regulation and manual (such as Public Finance Management Act, 1999 (Regulation 16 of 1999) and PPP Manual) governing the PPPs on toll road concessions in South Africa are sound and adequate?
- 1.2. Do you think SANRAL and Concessionaires perform their functions within the parameters of SANRAL and National Roads Act, 1998 (Act 7 of 1998) in terms of managing and controlling toll roads in SA?
- 1.3. With regards to the regulations, specifically for toll roads, do you think there should be a regulatory body for this sector?

2. Interview questions on functions of SANRAL and Concessionaires on Toll Road Concessions

- 2.1. Do you think SANRAL is adequately overseeing the planning, design, construction, operation, management, control, finance, maintenance and rehabilitation of toll roads under examination which are being performed by Concessionaires?

3. Interview questions on Parliamentary Committee on Infrastructure's oversight on the management of PPP's agreements in SA

- 3.1. Does the Parliamentary Committee on Infrastructure, performs its oversight duties adequately in terms of monitoring the Toll Road Concession Sector?
- 3.2. Based on your assessment, do you think the Parliamentary Committee on Infrastructure ensures that Concessions under study provide Value for Money?
- 3.3. Based on your assessment, do you think evidence based technical expertise or political influence played any role in the selection of DFBOT model to the three road concessions under investigation?

4. Interview questions on toll tariffs

- 4.1. According to you, does the toll tariffs justified in terms of the road conditions and service provided to customers at the toll roads under study?
- 4.2. In terms of messaging, does SANRAL and Concessionaires communicate effectively with customers on toll discounts, payments and adjustments?

ANNEXURE 5: NOTICE OF SUBMISSION



PO Box 1174, Vanderbijlpark
South Africa 1900

Tel: 016-910-3182

Web: <http://www.nwu.ac.za>

For Registrar

Tel: 016-910-3033

Email: Jenna.Wilson@nwu.ac.za

3 November 2021

Dear Mr TD Borole

NOTICE OF SUBMISSION

Note has been taken that you wish to submit your mini-dissertation/dissertation/**thesis** for examination. The registered title as it must appear on the examining copies and on the title page of the final copies is indicated below. An example of your title page will be sent together with this letter.

The effectiveness of public private partnerships in the development of road infrastructure: the case of toll concessions in South Africa

Your attention is drawn to the following matters regarding the above.

- You may submit your examination copies from **3 February to 21 March 2022** to possibly qualify for the **Winter (July) graduation ceremony in 2022**.
- **Submissions received after 21 March 2022 will be considered in time for examination towards possible graduation during the Spring graduation series of 2022.**

You are required to submit your examination copy in the following format:

- **One electronic copy in Word format and one electronic copy in PDF format to be submitted via email to a HDA official. You may also submit in person, over the counter to a HDA official. Please submit one hard copy in person, over the counter to a HDA official.**

The following forms must be submitted with your examination copies:

- **The signed Solemn Declaration form**
- **Personal particulars form (only applicable for PhD students)**
- **Acknowledgement of Receipt**
- **Copy of your ID**
- **Please visit the DIY Student 360® to ensure that your personal details are correct on the system and on your degree certificate please**

I trust you find the above in order. Please do not hesitate to contact the undersigned for any more related information

Yours sincerely

Ms J Wilson

FOR REGISTRAR

Original details: (10512187) M:\HDA Toolbox\Phase 3\2. Notice of SubmLetter to student\July 2018\NOS July 2018 letter .docm
6 March 2018

File reference: 7.1.11.2.1

ANNEXURE 6: ETHICS APPLICATION APPROVED



PO Box 1174, Vanderbijlpark
South Africa 1900

Tel: 016 910-3111
Fax: 016 910-3116
Web: <http://www.nwu.ac.za>

Faculty of Humanities
Tel: 016-91003441
Email: Chrizanne.vaneeden@nwu.ac.za

7 October 2020

Dear Mr Borole and Prof Lukamba,

ETHICS APPLICATION APPROVED

This letter serves to inform you that your ethics application was approved by the Ethics Committee for Basic and Social Sciences (BaSSREC) of the NWU.

ETHICS APPLICATION NUMBER: NWU-01983-20-S7
STUDY SUPERVISOR: Prof Lukamba
APPLICANT: Mr TD Borole
PROJECT TITLE: The effectiveness of public private partnerships in the development of road infrastructure: The case of toll-road concessions in South Africa.
DURATION: 7 October 2020 to 7 October 2021. An annual monitoring report is required.
ETHICS APPROVAL DATE: 7 October 2020

Your acceptance of the reviewers' recommendations is appreciated and your research will be conducted in line with such recommendations.

Your application for ethics approval was approved by BaSSREC on the 30 September 2020 and this REC wishes you well with your study.

Yours sincerely

Prof C Van Eeden
Chair: BaSSREC

Original details: (10057013) P:\Daleen\BaSSREC\Prof C van Eeden-letter.docm
10 September 2019
File reference: 9.1.5

ANNEXURE 7: RESEARCH TITLE APPROVED



PO Box 1174, Vanderbijlpark
South Africa, 1900

Faculty of Humanities
Humanities Research Management Committee
Tel: (016) 910-3662
23991437@nwu.ac.za
Date: 18 November 2019

Mr T.D. Borole

Student no: 20446594

Research title as approved by the Humanities Research Management Committee:

The effectiveness of public private partnerships in the development of road infrastructure: The case of toll road concessions in South Africa

Dear Mr Borole

This letter serves to confirm that your PhD research proposal has been approved by the Humanities Research Management Committee.

The ethics application is referred to the:

* Research Ethics Committee- BaSSREC: X .

* Research Ethics Committee-HHREC: .

You will find the details on the procedure that you will have to follow to submit to the Ethics Committee on the NWU-website. For the HRMC-records, please inform Ms Precious Nale as the responsible person when your submission has been successfully completed and approved (Precious.Nale@nwu.ac.za).

Yours sincerely,

Prof C Hofisi
Chairperson: Vaal Campus Humanities Research Management Committee

ANNEXURE 8: SANRAL PERMISSION LETTER

Reference: Research Consent/NWU Fax Number: +27 (0) 21 910 1699
Date: 28 September 2020 Direct Line: +27 (0) 21 957 4600
Email: harperh@nra.co.za Website: www.nra.co.za



Dear Prof MT Lukamba
North-West University
Email : MT.Lukamba@nwu.ac.za

RE: GATEKEEPERS PERMISSION LETTER FOR RESEARCH ON "THE EFFECTIVENESS OF PUBLIC PRIVATE PARTNERSHIPS IN THE DEVELOPMENT OF ROAD INFRASTRUCTURE: THE CASE OF TOLL ROAD CONCESSIONS IN SOUTH AFRICA – MR THABO BOROLE

I, Heidi A. Harper in my capacity as General Manager Skills Development within the South African Roads Agency SOC Limited (SANRAL), grant permission to Mr Thabo Borole to collect data at this site for his research project titled "The effectiveness of Public Private Partnerships in the development of Road Infrastructure : The case of Toll Concessions in South Africa".

I grant this permission on condition of the following:

1. The study is conducted by Mr. Borole T.D student 20446594 who is a PhD candidate in Public Management and Administration at the North-West University/ Vaal Triangle Campus, in South Africa for academic purposes and remains the property of NWU;
2. Permission is granted to identify and use the name of the South African Roads Agency (SOC) Limited (SANRAL) in the research project report;
3. All data and information collected will be solely in the possession of the researcher in the context of his academic pursuit;
4. Feedback of the research will be formally provided to SANRAL well before the research is published;
5. The research may be published in the public domain under the supervision of the academic supervisor, within the ethical boundaries of good research and without bringing SANRAL into disrepute.
6. The researcher intends to uphold professional conduct in all aspects of involvement in this project;
7. The researcher commits not to involve lobby groups or the media in the study.

I wish you everything of the best in your research studies.

A handwritten signature in black ink, appearing to be "H. Harper", written over a horizontal line.

Mrs H. A. Harper GM Skills Development

ANNEXURE 9: ANC PERMISSION LETTER

AFRICAN NATIONAL CONGRESS

OFFICE OF THE HEAD OF PRESIDENCY.



Chief Albert Luthuli House, 54 Pixley ka Isaka-Seme Street, JOHANNESBURG, 2001.P.O. Box 61884, Marshalltown, 2107, RSA
Tel: +27 11 376 1000, email: ltali@anc1912.org.za

Mr T.D Borole
boroletd@gmail.com

Dear Mr Borole

Confirmation of willingness to participate in research titled;

**“The Effectiveness of Public Private Partnerships in the Development of Road Infrastructure:
The Case of Toll Road Concessions in South Africa”**

Please note that the African National Congress is able to assist with this research where it can. For more information, please contact Mr Sibongile Besani.

Kind regards

Sibongile Besani
Head of Presidency: African National Congress
Date: 30 August 2021

Copy: Professor MT. Lukamba
North-West University

President: C. Ramaphosa, Deputy President: D. Mabuza, National Chairperson: G Mantashe, Secretary General: ES. Magashule,
Deputy Secretary General: J Duarte, Treasurer-General: SP. Mashatile

ANNEXURE 10: DEPARTMENT OF TRANSPORT PERMISSION LETTER



transport

Department:
Transport
REPUBLIC OF SOUTH AFRICA

Private Bag X 193, PRETORIA, 0001 Forum Building, 159 Struben Street, Pretoria, 0002
Tel (012) 309 3000 Fax (012) 328 5926



To Mr TD Borole
c/o Professor MT. Lukamba
North West University
boroletd@gmail.com

**CONFIRMATION OF ASSISTANCE WITH GATE KEEPERS PERMISSION LETTER FOR RESEARCH
ON "THE EFFECTIVENESS OF PUBLIC PRIVATE PARTNERSHIPS IN THE DEVELOPMENT OF ROAD
INFRASTRUCTURE: THE CASE OF TOLL ROAD CONCESSIONS IN SOUTH AFRICA".**

Dear Mr Borole

The letter from Professor MT. Lukamba refers,

Please note, in terms of the Section 25 of the South African National Roads Agency Limited and National Roads Act 7 Of 1998, the Agency, within the framework of government policy, is responsible for, and is hereby given power to perform, all strategic planning with regard to the South African national roads system, as well as the planning, design, construction, operation, management, control, maintenance and rehabilitation of national roads for the Republic, and is responsible for the financing of all those functions in accordance with its business and financial plan, so as to ensure that government's goals and policy objectives concerning national roads are achieved, subject to section 32 (3).

SANRAL will be able to assist you where they can with your research. Please contact Mr Skhumbuzo Macozoma for any assistance by sending an email to Surprise Ngobeni on NgobeniS@nra.co.za

The Department wishes you well with studies and would appreciate a copy of your research report upon completion of your studies.

Kind regards


Prasanth Mohan
Chief Director: Road Infrastructure & Industry Development

29/7/2020

ANNEXURE 11: NATIONAL TREASURY PERMISSION LETTER



national treasury

Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

Mr T.D Borole
boroletd@gmail.com

Dear Mr Borole

Confirmation of willingness to participate in research titled “The Effectiveness of Public Private Partnerships in the Development of Road Infrastructure: The Case of Toll Road Concessions in South Africa”

Please note that the National Treasury is able to assist with the research as described above. For more information, please contact Refilwe Mokanse, senior projects analyst in the National Treasury. His contact details are as follows: refilwe.mokanse@treasury.gov.za or [REDACTED].

Kind regards

Dorcas Kayo
Director: Infrastructure Finance
National Treasury
Date: 16.06.2021

Copy: Professor MT. Lukamba

ANNEXURE 12: GTAC PERMISSION LETTER



Private Bag X115 | Pretoria 0001
240 Madiba Street | Pretoria 0002
T +27 012 315 5111

Enquiry: T Schoeman
Telephone : 012 315 5652
Email: Tessa.schoeman@gtac.gov.za
File Ref No: General

Mr. T.D. Borole
boroletd@gmail.com

Dear Mr Borole

CONFIRMATION OF ASSISTANCE IN RESEARCH ON ENTITLED "THE EFFECTIVENESS OF PUBLIC PRIVATE PARTNERSHIPS IN THE DEVELOPMENT OF ROAD INFRASTRUCTURE: THE CASE OF TOLL ROAD CONCESSIONS IN SOUTH AFRICA".

The Transaction Advisory and PPP Unit in GTAC will be able to assist you where they can with your research.

Please contact Lindokuhle Hlatshwayo, Senior Project Adviser for any assistance.

Kind regards

Lindokuhle Hlatshwayo
SENIOR PROJECT ADVISOR

Date: 06/03/2020



www.gtac.gov.za



ANNEXURE 13: OUTA PERMISSION LETTER



20 March 2020

Attention: Mr Borole T.D
PhD Candidate
BY EMAIL: boroletd@gmail.com

Dear Mr Borole,

Further to the request in your letter dated 26 February 2020, we hereby grant you permission to conduct research and collect data on OUTA.

We wish you all the best in your studies.

Yours sincerely

A handwritten signature in black ink, appearing to be "WD", with a stylized flourish at the end.

Wayne Duvenage
OUTA - Chief Executive Officer
E-Mail: Wayne.duvenage@outa.co.za

ORGANISATION UNDOING TAX ABUSE NPC

Reg No.: 2012/064213/08

Directors: W Duvenage (CEO), Adv. S Fick, Dr H Volmink

Non-Executive Directors: F Adam (Chair), P Majoz, W Modisapodi, LP Pauwen, T Pillay Van Graan

Address: O'Keeffe & Swartz Building, 318 Oak Avenue, Randburg, Gauteng

Contacts: 087 170 0639 • info@outa.co.za • www.outa.co.za

ANNEXURE 14: N3TC PERMISSION LETTER

Mr TD Borole

2 November 2020

Dear Mr Borole



Thesis: The Effectiveness of Public Private Partnerships in the Development of Road Infrastructure: The Case of Toll Road Concessions in South Africa

N3TC hereby agrees to provide you with information pertaining to the N3TC which is of a public nature. You are requested to contact the writer with regards to the information required.

We wish you well with your studies and would request that you provide us with a copy of your thesis once completed.



CJ (Neil) Tolmie
CEO

1st Floor, Block D, Southdowns Office Park, 22 Karee Street, Irene

Tel: (087) 285 6382 • www.n3tc.co.za

Directors: H Ndlovu (Chairperson) • M A Edington • P A K Gama • J F Howard • M M Malao • K J Maluleke • M Mpanza • P D Naidoo • M M Nieuwoudt • H V Ntoi • M Pema • C Williams

CEO: C J Tolmie • CFO: N Khoza

N3 Toll Concession (RF) Proprietary Limited • Company Reg. No. 1998/020534/07

ANNEXURE 15: TRAC PERMISSION LETTER



12 March 2020

Mr T.D. Borole
boroletd@gmail.com

Dear Mr Borole

CONFIRMATION OF ASSISTANCE IN RESEARCH ON ENTITLED "THE EFFECTIVENESS OF PUBLIC PRIVATE PARTNERSHIPS IN THE DEVELOPMENT OF ROAD INFRASTRUCTURE: THE CASE OF TOLL ROAD CONCESSIONS IN SOUTH"

Trans African Concessions will be able to assist you where they can with your research.

For any assistance to the above, kindly contact the Technical & Engineering Department.

Best regards


W.J. JANSE VAN RENSBURG
Executive Manager: Technical & Engineering

Trans African Concessions (Pty) Ltd

Reg. No. 1997/004427/07

Building A, 69 Regency Drive, Route 21 Corporate Park, Irene, Centurion, 0157

Tel: 2711 805 8788. Fax: 2711 805 8789.

Directors: G. B. Babaya, W.J. Crosse**, E.G. Esterhuysen, D. Horton, J. F. Howard, S.G. MacDonald*, M.P.C. Viola***, C. Williams.
*British **Irish ***Mozambican

ANNEXURE 16: BAKWENA PERMISSION LETTER

3/12/2020

Gmail - REQUEST FOR PERMISSION LETTER



thabo daniel <boroletd@gmail.com>

REQUEST FOR PERMISSION LETTER

Liam Clarke <liamc@bakwena.co.za>

9 March 2020 at 11:05

To: thabo daniel <boroletd@gmail.com>

Cc: Solomon Kganyago <SolomonK@bakwena.co.za>, "MT.Lukamba@nwu.ac.za" <MT.Lukamba@nwu.ac.za>

Good Day Thabo

Bakwena would be pleased to assist you with your research thesis "The Effectiveness of Public Private Partnerships in the Development of Road Infrastructure: The Case of Toll Road Concessions in South Africa"

On completion of your thesis it would be appreciated if you can provide us with a copy.

Regards

Liam Clarke

Project Manager

t: +27 11 519-0402 | f: +27 11 519-0411 | m: +27 82 491-5373 | e: liamc@bakwena.co.za | w: bakwena.co.za



Bakwena Platinum Corridor Concessionaire (Pty) Ltd | Disclaimer: View our email disclaimer online

[Quoted text hidden]

<https://mail.google.com/mail/u/0?ik=1f913b39ef&view=pt&search=all&permmsgid=msg-f%3A1660676713382593136&simpl=msg-f%3A166067671338...> 1/1

ANNEXURE 17: SAFTU PERMISSION LETTER



South African Federation of Trade Unions

5th Floor, JC Bez Building, Corner Frederick and Eloff Street, Johannesburg
Tel: 011 331 0124 Fax: 011 331 0176 Email: info@safu.org.za Website: <http://safu.org.za>

29th August 2021

Mr T.D. Borole
PhD Candidate
University of North West
North West Province

CONFIRMATION ON THE RESEARCH PROJECT AROUND THE EFFECTIVENESS OF PUBLIC PRIVATE PARTNERSHIPS IN THE DEVELOPMENT OF ROAD INFRASTRUCTURE: THE CASE OF TOLL-ROAD CONCESSIONS IN SOUTH AFRICA.

Dear Sir

1. Please find the letter of consent from SAFTU North West Province in relation to the above subject matter.
2. SAFTU as one independent labour Federations having developed an interests on the research project hereby wishes to confirm in writing our commitment in assisting or availing ourselves in this regard.
3. For more information please contact SAFTU North West Provincial Secretary, Puseletso Molise on 0724169449.
4. Hope and trust this communique will find your favorable attention.

Kind Regards

Signed
Puseletso Molise
SAFTU NW Provincial Secretary

SAFTU NORTH WEST PROVINCIAL LEADERSHIP

Provincial Chairperson: David Kavari, Deputy Provincial Chairperson: Kagiso Motshwane,
Provincial Secretary: Puseletso Molise, Provincial Treasurer: Oneilwe Garenamotse

ANNEXURE 18: ROAD FREIGHT ASSOCIATION PERMISSION LETTER



04 October 2021

North-West University
PO Box 1174
Vanderbijlpark
1900

Per e-mail: MT.Lukamba@nwu.ac.za; boroletd@gmail.com

Dear Mr Borole,

Thesis: The Effectiveness of Public Private Partnerships in the Development of Road Infrastructure: The Case of Toll Road Concessions in South Africa

The Road Freight Association (Association) hereby agrees to provide you with information, which is of a public nature, for utilisation in the research related to your proposed topic.

As the Association has noted before, any information relating to individuals or corporates must be dealt with in compliance with the prescripts of the Protection of Personal Information (POPI) Act. It is crucial that the identities of contributors be protected – especially where there may be opportunity for undue influence or coercion.

The Association wishes you well with your research, and as a prerequisite to providing information and support to your research, requests that you provide the Association with a copy of your thesis once completed.

Further enquiries should be addressed to the Association.

Yours Sincerely

Gavin A Kelly
Chief Executive

Contact details: 011 9744399 charlene@rfa.co.za

WITHOUT TRUCKS, SOUTH AFRICA STOPS!

Directors: SP Lunga (Chairperson), PW Mountford (Vice Chairperson), PC Bailey, TP Bantock, TL Bereda, GD Bolton, AJ Du Preez, D Joubert, GA Kelly, GC Marais, PEJ Pols, M Rylance, L Serman, M Sodalay, SJ Swanepoel, AK Tayob
Chief Executive: GA Kelly

ANNEXURE 19: PROOFREADING CERTIFICATE



Proofreading Certificate

It is hereby certified that this thesis has been proofread and edited for spelling, grammar and punctuation by a professional English language editor from www.OneStopSolution.co.za

Client

THABO BOROLE

THE EFFECTIVENESS OF PUBLIC-PRIVATE PARTNERSHIPS IN THE DEVELOPMENT
OF ROAD INFRASTRUCTURE: THE CASE OF TOLL ROAD CONCESSIONS
IN SOUTH AFRICA

Editor

Matthew Harvey

Name

Signature

15 March 2022

Date

I cannot guarantee that the changes that I have suggested have been implemented nor do I take responsibility for any other changes or additions that may have been made subsequently. The track changes of the language editing will be available for inspection upon enquiry, for a period of one year.

Contact

One Stop Solution
18 Woltemade str
Kabega Park
Port Elizabeth
6045

Redene Steenberg
076 481 8341
www.OneStopSolution.co.za