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List of Abbreviations

2-3 HV	Heavy goods vehicles (2-3 Axles)
4-5 HV	Heavy goods vehicles (4-5 Axles)
6 & 6+ HV	Heavy goods vehicles (6 and 6+ Axles)
AADT	Average Annual Daily Traffic
AKZ	Angolan Kwanza
ANE	National Roads Agency of Mozambique
ASANRA	Association of Southern African National Roads Agencies
ASYCUDA	Automated System for Customs Data
AVG	Average
BUS	Buses
CBC	Cross-Border Charges
CBCS	Namibia Cross Border Charging System
cc	Cubic Centimetre (measurement of Engine Capacity)
CEO	Chief Executive Officer
COMESA	Common Market for Eastern and Southern Africa
CRF	Consolidated Revenue Fund
CVR	Zimbabwe Central Vehicle Registry
CZI	Confederation of Zimbabwe Industries
DoRR	Lesotho Department of Rural Roads
DPOPH	Mozambique Provincial Directorate of Public Works and Housing
DRC	Democratic Republic of Congo
EAC	East African Community
E	Emalangen
E80/ESAL	Equivalent standard axle
FE	Road Fund of Mozambique
FESARTA	Federation of East and Southern African Road Transport Associations
GIS	Geographical Information System
GPS	Global Positioning Satellite
GSM/RF	Global System for Mobile Communication/Radio Frequency
GVM	Gross Vehicle Mass
HDM-4	Highway Development and Management Model -4
INEA	Angolan Roads Agency
JV	Joint Venture
K	Kwacha
Km	Kilometres
LA	Local Authority
LV	Light Vehicles
M	Maloti
MCC	Maseru City Council
MDC	Mass Distance Charges
MIS	Management Information System
MK	Malawi Kwacha
MoF	Ministry of Finance
MoLG	Lesotho Ministry of Local Government
MOPH	Mozambique Ministry of Public Works and Housing
MoPWT	Lesotho Ministry of Public Works and Transport
MPWT	Swaziland Ministry of Public Works and Transport
MTC	Zimbabwe Ministry of Transport and Communication
MVA	Motor Vehicles Accident Fund
MWTC	Namibia Ministry of Works, Transport and Communication
N\$	Namibia Dollar

NRA	National Roads Authority of Malawi
NRFA	Zambia National Road Fund Agency
NRSC	National Road Safety Council
PMO-RALG	Tanzania Prime Minister's Office Regional Administration and Local Government
PTA	Preferential Trade Area
RA	Namibia Roads Authority
RB	Lesotho Roads Branch
RCC	Namibia Roads Contractor Company
RDA	Zambia Roads Development Agency
RDC	Zimbabwe Rural District Council
RF	Road Fund
RFA	Namibia Road Fund Administration
RICB	Regional Integration and Capacity Building Programme
RTRN	Regional Trunk Route Network
RTSA	Zambia Road Transport and Safety Agency
RUC	Road User Charges
SA	South Africa
SACU	Southern African Customs Union
SADC	Southern African Development Community
SANRAL	South Africa National Roads Agency Limited
SATCC	Southern African Transport and Communications Commission
SSATP	Sub-Saharan African Transport Policy
TANLAB	Laboratory Unit of TANROADS
TANROADS	Tanzania National Roads Agency
TANWEIGH	Weighbridge Unit of TANROADS
TRA	Tanzania Revenue Authority
TShs	Tanzania Shillings
US\$	United States Dollar
VAT	Value Added Tax
VKT	Vehicle kilometres traveled
ZIM \$	Zimbabwe Dollar
ZIMRA	Zimbabwe Revenue Authority
ZINARA	Zimbabwe National Road Administration

Currencies and Exchange Rates used in the Study

Local Currency	Exchange Rate (US\$:currency)
Angola Kwanza	1 : 83.9
Botswana Pula	1 : 5.44
DR Congo Franc	1 : 437
Lesotho Maloti	1 : 6.2
Malawi Kwacha	1 : 134.5
Mozambique Metical	1 : 27340
Namibia Dollar	1 : 6.2
South Africa Rand	1 : 6.2
Swaziland Emalangenani	1 : 6.2
Tanzania Shilling	1 : 1200
Zambia Kwacha	1 : 2851.7
Zimbabwe Dollar	Varying

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Executive Summary

1. INTRODUCTION

1.1 Background

1.1.1 Previous studies

The road networks of the SADC countries are essential for economic activity and for basic social needs. However, despite their importance, many road systems are not in satisfactory condition due to inadequate funding for road maintenance. In view of limited resources available through traditional government funding sources, the governments of most SADC countries, prompted by Article 4.5 of the SADC Protocol on Transport, Communications and Meteorology have embarked on securing alternative sources of off-budgetary financing through the introduction of appropriate cost recovery systems, including road user charging.

Concerns also existed regarding the damage done to host country road networks by foreign heavy vehicles, on the one hand, and on the other the discrepancy in charges imposed on foreign versus domestic vehicles travelling in a country.

Considerable effort has been expended in the past two decades in attempting to develop a harmonised road user charging (RUC) system for the SADC region with previous studies dating back to the early 1980s. However, these early studies were hampered by lack of reliable data regarding the structure of road costs as well as poor information on road traffic.

Most recently, in 1997, a SATCC/SACU Joint Task Team developed a *Proposed System of Harmonised Road Transit Charges for the SADC Region* which was endorsed by SADC Ministers of Transport for implementation starting in 1999. Unfortunately, for a variety of reasons, including lack of country-specific guidelines on implementation of the RUC system and lack of capacity to implement the institutional changes required, such implementation has generally not taken place.

1.1.2 The current study and its objectives

In view of the general lack of progress in implementing the SATCC/SACU RUC system, SADC has obtained funding from the EU to update this study and to facilitate implementation across the SADC region. For this purpose, AFRICON was appointed

to conduct the study on Implementation of a Harmonised Road User Charging System in the SADC Region. The overall objectives of the study are to:

- (a) Develop a strategy for the sustainable recovery of costs related to the use of roads in SADC member states;
- (b) Develop documentation for the implementation of harmonized cross order road user charges.

2. Overall Scope of Work

The overall scope of work undertaken during the course of the study has included the following:

- Collection of data on all charges payable by road users in the SADC Member States;
- Data collection and developing modalities for future data updating;
- Identification of alternative technical solutions to collecting the road user charges;
- Analysis of alternative technical solutions;
- Consultation meetings with decision makers/stakeholders to identify the preferred technical solutions;
- Preparation of implementation manual and MoU; and
- Preparation of a regional implementation plan.

3. General Approach and Methodology

Based on the objectives of the study and the tasks given in the ToR, the study was executed in the following four phases.

- Phase 1 – Mobilisation, Data Collection and Analysis
- Phase 2 – Updating of Road User Charges
- Phase 3 – Identification and analysis of technical solutions for collection of Charges
- Phase 4 – Regional Implementation Plan.

The principles and methodology elaborated in the April 1987 SATCC/SACU study and subsequently endorsed at the SADC Committee of Ministers Meeting that was held in Lilongwe in January 1995 established the ground rules for the current study.

4. Main Findings

4.1.1 Current charges levied from road users

The types of charges that are payable by vehicle operators when entering a country and making use of the road network of the country vary considerably. These fees are as follows:

- **Compulsory access fees** refer to all charges that are payable at the border posts upon entering a specific country.
- **Other Fees** include fees payable on toll roads, fuel levies and fuel taxes. Tolls are currently only payable in South Africa and Mozambique. Fuel levies were included in the cases where there is a dedicated fuel levy. Fuel taxes are used as a proxy for countries who do not have a dedicated fuel levy in order to arrive at comparable results. Regarding fuel levies and fuel taxes, it should be noted that cost recovery levels were calculated by including and excluding fuel levies and taxes, as these are not necessarily payable if there is no need to refuel in a specific country.
- **Domestic Fees** include annual vehicle licence fees that are only paid by domestic vehicles. Although fee levels were recorded where available, these fees were excluded from the calculation of cost responsibility and cost recovery as they do not apply to transit traffic.

Table 1 shows the list of charges payable by road users in the various SADC countries:

Table 1 – Charges payable by road users in various SADC countries

RUC Category	Charge Type	Country											
		Ang	Bot	DRC	Les	Mal	Moz	Nam	SA	Swazi	Tan	Zam	Zim
Compulsory Access Fee	Transit Charges/Fees/Tolls	X				X	X			X	X	X	X
	Foreign Vehicle Permit Fees										X		
	Cross-Border Charges							X					
	Road Transport Permit Fees		X										
	Entry Card Fees			X									
	Insurance Fees			X									
	Container Fees			X									
	Fumigation Fees			X									
	Toll Fees**			X									
	Road Tollgate Fees**				X								
	Carbon Taxes											X	X
Surveillance Fees			X										
Domestic Fee	Annual Vehicle Licence Fees	Reviewed but not considered as only applicable to domestic vehicles											
Other Fees	Fuel Levies		X		X	X	X	X			X	X	X

RUC Category	Charge Type	Country											
		Ang	Bot	DRC	Les	Mal	Moz	Nam	SA	Swazi	Tan	Zam	Zim
	Fuel Taxes*			X					X	X			
	Tolls						X		X				

Note: * Considered as a proxy for the fuel levy. Angola does not have a dedicated fuel levy, and as the fuel price is subsidised, fuel taxes are also not applicable in Angola.

** Toll fees and road toll gate fees are levied at the border post when entering the respective country and are therefore separate from fees charged on toll roads.

The following is evident from the table:

- Some form of transit or entry fee is payable when entering most countries
- A series of different fees are payable when entering the DRC
- Carbon taxes has been introduced recently as a new type of road user charge in Zimbabwe and Zambia.

4.1.2 Extent of the RTRN

The extent of the RTRN was confirmed during visits to all of the SADC countries and is summarised in Table 2, which shows a comparison with the RTRN as defined by SADC in 1998.

Table 2 – Extent of the SADC RTRN

Country	Extent of the RTRN (km)			
	Country Visits	SADC 1998	Difference	% Difference
Angola	7,096.00	8,215.00	(1,119.00)	-13.6%
Botswana	2,831.70	2,847.00	(15.30)	-0.5%
DR Congo*	8,370.00	8,370.00	-	0.0%
Lesotho	1,075.09	942.00	133.09	14.1%
Malawi	1,400.00	1,800.00	(400.00)	-22.2%
Mozambique	5,692.00	5,407.00	285.00	5.3%
Namibia	3,748.54	4,580.00	(831.46)	-18.2%
South Africa	10,458.22	7,470.00	2,988.22	40.0%
Swaziland	440.97	326.00	114.97	35.3%
Tanzania	6,866.33	7,384.00	(517.67)	-7.0%
Zambia	2,968.00	5,355.00	(2,387.00)	-44.6%
Zimbabwe	2,848.00	3,232.00	(384.00)	-11.9%
TOTAL	53,794.86	55,928.00	(2,133.15)	-3.8%

Note: The RTRN for the DR Congo was redefined in 2001, and the RTRN as per the country visit corresponds to that defined in 2001.

The most significant difference between the SADC RTRN and the RTRN defined during the country visits pertains to Zambia where the difference is 44.6% (lower than the RTRN originally defined by SADC). The second highest difference is for South

Africa where the RTRN is about 40% higher than the RTRN originally defined by SADC.

A map of the entire RTRN as defined during the country visits is shown in Figure 1.

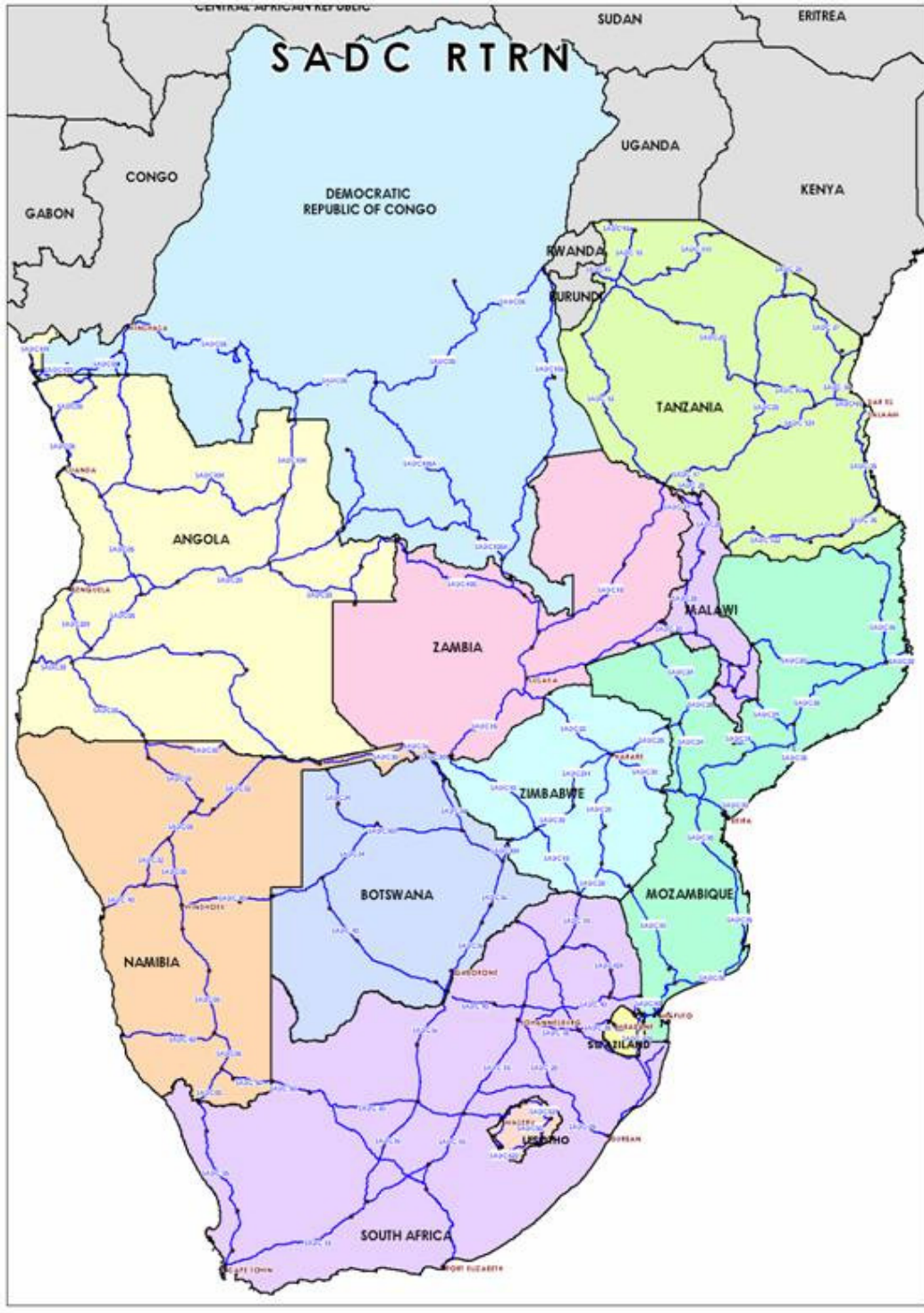


Figure 1 – The SADC RTRN

4.1.3 Cost Responsibility and Recovery

The weighted average cost recovery levels compared to the cost responsibility levels are shown in the Figure 2 from which it will be noted that the cost recovery levels exceed the cost responsibility levels in all cases except Angola, Botswana and DR Congo in the case where fuel levies are included. If fuel levies are excluded, cost under recovery does not only occur in Angola, Botswana and DR Congo but also in Lesotho, Mozambique and Namibia.

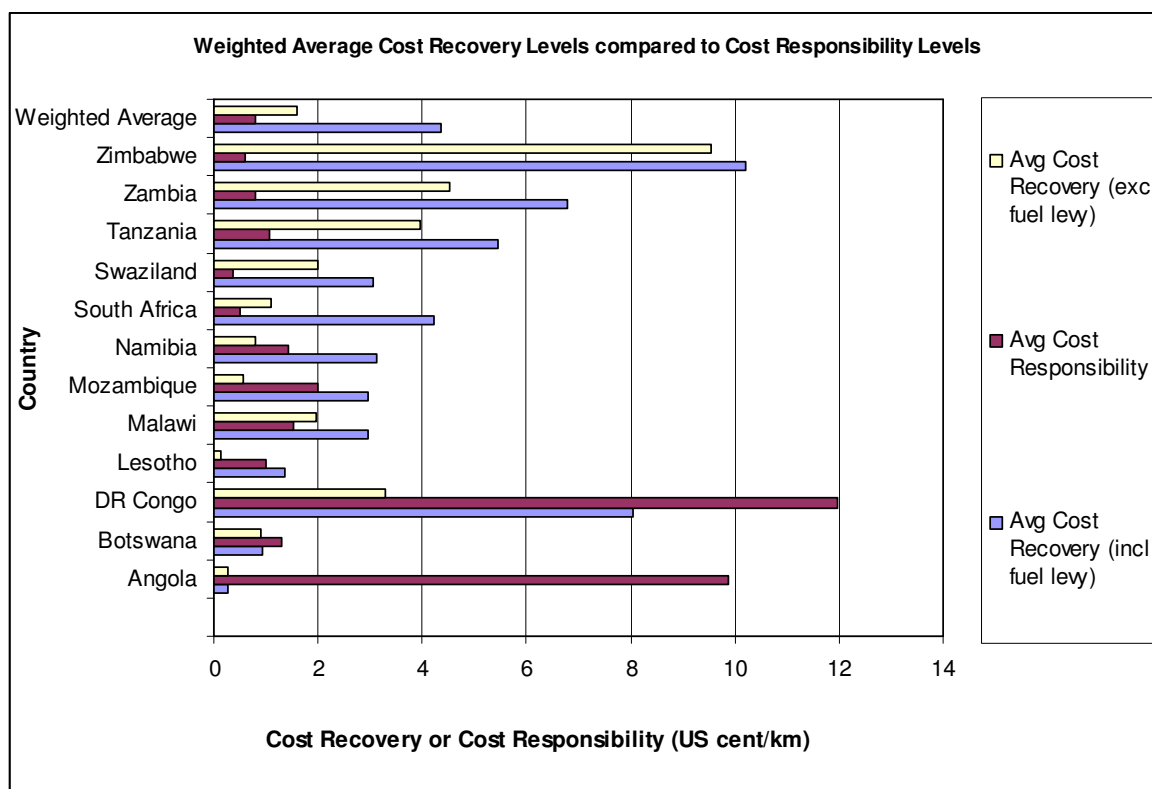


Figure 2 – Weighted Cost Recovery Levels compared with Cost Responsibility Levels

4.1.3 Proposed transit charges – current versus previous

The transit charges proposed for implementation in the SADC region are shown in Table 3, together with those recommended in the 1997 SATCC/SACU study.

Table 3: Proposed Charges (2007 Study) versus 1997 Charges

Country	2007 versus 1997 Study Proposed Road Transit charges (US\$/100km)									
	LV		BUS		2-3 HV		4-5 HV		6 & 6+ HV	
	2007	1997	2007	1997	2007	1997	2007	1997	2007	1997
Angola	1.57	-	9.61	-	15.06	-	22.91	-	29.88	-
Botswana	0.21	0.60	1.78	3.40	2.34	4.20	4.02	8.80	5.62	12.20
DR Congo	6.21	-	30.13	-	55.28	-	75.80	-	91.96	-
Lesotho	0.32	1.35	1.90	5.00	3.11	8.40	4.59	13.45	5.86	20.80
Malawi	0.47	1.00	3.57	5.40	4.75	7.90	8.11	15.55	11.32	20.50
Mozambique	0.44	1.50	3.10	7.10	4.52	10.50	7.21	21.10	9.67	27.90
Namibia	0.38	1.60	2.76	9.25	3.80	12.00	6.34	23.00	8.73	31.90
South Africa	0.16	0.35	0.94	1.55	1.50	2.15	2.26	4.25	2.92	7.55
Swaziland	0.13	0.55	0.89	2.65	1.29	3.65	2.08	7.55	2.80	8.80
Tanzania	0.30	0.90	1.81	3.90	2.82	5.70	4.32	11.40	5.67	15.05
Zambia	0.12	0.90	0.93	4.00	1.28	5.90	2.13	11.90	2.93	15.70
Zimbabwe	0.13	0.75	0.83	2.90	1.26	4.20	1.97	8.25	2.61	10.90
Average	0.24	0.95	1.56	4.50	2.61	6.45	3.27	12.50	4.27	17.00

The reasons for the higher charge levels in 1997 can be attributed to the following:

- The 1997 Study included rehabilitation costs to be recovered from road users. In this current study it was however assumed that *the entire road network is in a maintainable condition*. If rehabilitation costs were to be included, the results per country would not have been comparable especially due to the fact of the vast differences in terms of rehabilitation requirements or backlog maintenance to be carried out on especially the networks of Angola and DR Congo which were during the 1997 Study excluded from the analysis.
- Traffic levels have increased significantly since 1997 which in turn resulted in a drastic increase in VKT and E80km on the respective networks. Since the allocation of costs and the resultant cost responsibility is made on the basis of VKT and E80km, it can be expected that the charge levels will decrease.

4. Main Recommendations

4.1 Revision of the RTRN

Based on the significant differences in the extent of the RTRN as defined previously, especially in South Africa and Zambia, it is proposed to review the RTRN. It is understood that ASANRA will commission such a study shortly. The parameters for the definition of the RTRN apparently need to be revisited.

4.2 Consolidation of types of charge payable at the border posts

It is evident from the results of this study that road user charging systems still vary widely from country to country, although progress has been made in the implementation of roads agencies and in some cases road funds.

It was also clear from the study that there is little harmonisation in the SADC region regarding the types of road user charges levied at border posts, as well as the approach to determine their levels. It is recommended that they types of charges need to be harmonised, as well as the approach for their determination, using the levels presented in Table 3 but keeping in mind the other charges that are also levied in some countries. As a first step there should be consolidation of charges levied from transit vehicles.

4.3 Proposed Transit Charges

It is proposed that the transit charges are being levied based on vehicle weight and distance travelled instead of a fixed entry fee.

Vehicle type is used as a proxy for vehicle weight. The proposed charges in US\$ per 100km which are based on the cost responsibility levels are shown in Table 4 below.

Table 4: Proposed Road Transit Charges

Country	Proposed Road Transit charges (US\$/100km)				
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV
Angola	1.57	9.61	15.06	22.91	29.88
Botswana	0.21	1.78	2.34	4.02	5.62
DR Congo	6.21	30.13	55.28	75.80	91.96
Lesotho	0.32	1.90	3.11	4.59	5.86
Malawi	0.47	3.57	4.75	8.11	11.32
Mozambique	0.44	3.10	4.52	7.21	9.67
Namibia	0.38	2.76	3.80	6.34	8.73
South Africa	0.16	0.94	1.50	2.26	2.92
Swaziland	0.13	0.89	1.29	2.08	2.80
Tanzania	0.30	1.81	2.82	4.32	5.67
Zambia	0.12	0.93	1.28	2.13	2.93
Zimbabwe	0.13	0.83	1.26	1.97	2.61
Average	0.24	1.56	2.61	3.27	4.27

4.4 Solutions for collection of Charges

4.4.1 Measurement Methods

Due to the complexity of a technological system and the need for strict enforcement it is not clear if a technological system can be implemented for all continental SADC member states in the foreseeable future.

Therefore it is recommended that initially a simple system be implemented whereby distances are based on the destinations stated on the waybills for heavy goods vehicles. For light vehicles and passenger vehicles, the distance should be based on the stated destination of the vehicle operator. A schedule with origins and destinations for each possible route with corresponding fee or charge levels should then be used to calculate the appropriate charges.

4.4.2 Payment Methods

The use of coupons would appear to offer the most viable system. However, because of differing circumstances in the various SADC countries, it would be inappropriate to prescribe such a system in a blanket manner. Consequently, it is recommended that various forms of payment should be initially adopted, referring to cash, credit cards and coupons.

4.4.3 Collection methods

It is recommended that governments should give consideration to contracting the management and administration of collecting revenues for transit charges to the private sector. This has been done with success in Namibia. National Associations of Transporters or other private sector agents could be allowed to charge a commission for services rendered. In order for this system to function efficiently without default, it is advisable that each government enters into a contract with the institution/organisation.

4.5 Regional Implementation Plan

The draft regional implementation plan for implementing the harmonised road user charges is shown in Figure 3.

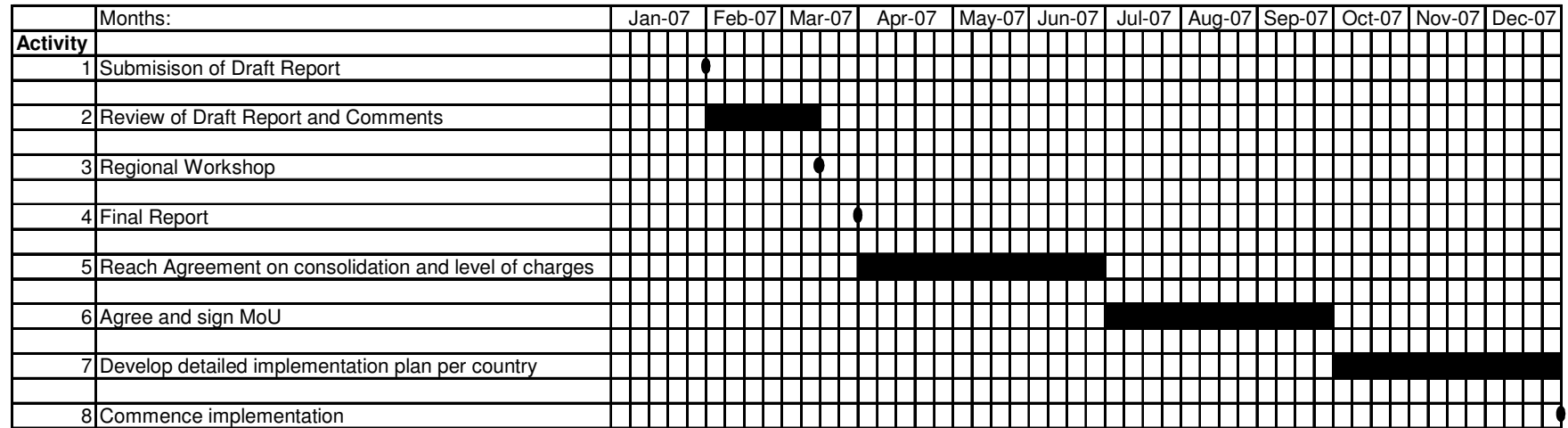


Figure 3: Regional Implementation Plan

1 Introduction

1.1 Background to the Study

Considerable effort has been expended in the past two decades in attempting to develop a harmonised road user charging (RUC) system for the SADC region. The main reason for this is the assertion that heavy vehicles that travel through the region damage the road network of host countries on the one hand, and that host countries use transiting heavy vehicles from other countries as a source of income by imposing various fess, taxes and charges upon entry and transit.

Previous studies on RUC date back to the early 1980s and were hampered by lack of adequate data regarding the structure of road costs in the SADC region as well as by poor information on road traffic. As a result, the analyses were considered to be too unreliable for use as policy recommendations in respect of the level and structure of road user charges.

Article 4.5 of the SADC Protocol on Transport, Communications and Meteorology stipulates that *“Member States agree to develop and implement cohesive and definitive road funding policies with a view to ... ensuring that road users, including foreign road users, contribute to the full costs of maintaining roads and progressively contribute to the full costs of providing roads while ... ensuring that the revenues obtained from foreign road users are devoted to the maintenance of the **RTRN** within their respective territories”*. Furthermore, Article 4.5.2 stipulates that: *“In order to promote **harmonized** national **RUC** systems, Members States shall develop a common understanding in respect of the types of road user charging and the levels of such charges and introduce in their respective territories on basis of regular exchange of information”*

During the early 1990s, initially the Preferential Trade Area (PTA – now COMESA), subsequently the Southern African Transport and Communications Commission (SATCC) and, more recently, the Southern African Customs Union (SACU) have all embarked on developing systems of harmonised road user charges for transit traffic in their respective regions. Unfortunately, these various studies differed with regard to some of the principles followed, and approach and methodology adopted, for

calculating transit charges. As a result, the outcome of these studies was not consistent in that the charges had not been derived on a common basis and, hence, were considered inappropriate for harmonised application.

The SATCC/PTA and SACU studies were discussed by the SATCC Committee of Ministers at an extra-ordinary meeting that was held in Malawi in January, 1995. The meeting decided that a Joint Task Team consisting of the SATCC/TU and SACU consultants should jointly undertake an in-depth review of their respective studies with a view to reconciling them as soon as possible. This review was undertaken and culminated in the production of a report that was prepared by a SATCC/SACU Joint Task Team entitled "Proposed System of Harmonised Road Transit Charges for the SADC Region". (April 1997). This report provides a major step forward in engendering regional agreement on the principles for road user charging, the method for calculating the charges, methods for collecting the charges, and how the funds collected should be managed and used.

Unfortunately, the SADC region has experienced considerable delays in implementing the harmonised road user charging regimes across the region. The delays have arisen from several factors including the on-going road sector reforms which are intended to provide the institutional regimes for sustainable road delivery, lack of country-specific guidelines on what needs to be done to implement the agreed charges and lack of national capacity to implement the changes that are required. This is despite the fact that the SADC Ministers of Transport agreed that the harmonized system should have been implemented starting in 1999.

The aim of this study is therefore to facilitate the implementation of a harmonised RUC system in the SADC region. AFRICON was appointed by the Southern African Development Community (SADC) Secretariat to conduct the study for the IMPLEMENTATION OF HARMONISED ROAD USER CHARGES SYSTEM IN THE SADC REGION.

This document, termed the DRAFT REPORT aims to present the study methodology, initial findings and recommendations.

1.2 Study Objectives

The overall objective of the proposed assignment is to contribute to the creation of a sustainable basis of funding for road infrastructure maintenance. The study includes the following study objectives:

- Collection of data on all charges payable by road users in the SADC Member States;
- Data collection and developing modalities for future data updating;
- Identification of alternative technical solutions to collecting the road user charges;
- Analysis of alternative technical solutions;
- Consultation meetings with decision makers/stakeholders to identify the preferred technical solutions;
- Preparation of implementation manual and MoU; and
- Preparation of a regional implementation plan.

1.3 Broad Methodology Adopted

Based on the objectives of the study and the tasks given in the ToR, the study was executed in the following four phases.

- Phase 1 – Mobilisation, Data Collection and Analysis
- Phase 2 – Updating of Road User Charges
- Phase 3 – Identification and analysis of technical solutions for collection of Charges
- Phase 4 – Regional Implementation Plan.

These are briefly discussed below.

1.3.1 Phase 1 – Mobilisation, Data Collection and Analysis

The aim of this phase was to convene a kick-off meeting with representatives of each of the twelve States, ASANRA HQ, FESARTA, SADC Secretariat and COMESA Secretariat. Data needs were communicated to the relevant representatives of each target country during the kick-off meeting. Target countries were also visited for purposes of data collection.

1.3.2 Phase 2 – Updating of Road User Charges

This phase was aimed at updating road user charges as calculated during the previous study titled “Proposed System of Harmonised Road Transit Charges for the SADC Region” (April 1997). This phase consists of three activities which are briefly discussed below.

1.3.2.1 Review RTRN Financing Needs

The main thrust of this activity was to determine the extent of the RTRN and to establish the maintenance requirements.

The extent of the RTRN was confirmed by means of country visits, and it should be noted that based on discussions held with officials there are some significant differences to the SADC RTRN defined in 1998.

1.3.2.2 Vehicle Classes and Road Use

The aim of this activity was to determine the usage of the network to arrive at vehicle kilometres travelled (VKT) on the RTRN. Parameters relating to each vehicle class were also determined such as average fuel consumption and equivalent standard axle loads (ESALs or E80s) which are shown in Table 1.3.1.

Table 1.3.1: Vehicle Characteristics

Vehicle Class	Type of Fuel	E80	Fuel Consumption (l/100km)
LV	Petrol	0.00	11
BUS	Diesel	1.39	40
2-3 HV	Diesel	1.40	37
4-5 HV	Diesel	2.79	52
6 & 6+ HV	Diesel	4.19	63

1.3.2.3 Cost Allocation Methodology and Model

This activity entailed establishing the principles to relate use of the RTRN to the cost of maintaining the RTRN, so that each vehicle class is apportioned its equitable share of costs.

Note should be taken of the following aspects regarding assumptions made and the approach followed:

- The World Bank/SADC **Cost Allocation Methodology** was followed. According to this methodology, the total annual maintenance cost on paved roads is divided into three categories, namely, E80 related costs (or pavement damage related costs), vehicle related cost, and fixed costs. The methodology used to divide the total cost into the three categories takes into consideration the total traffic volume and the percentage of heavy goods vehicles in the traffic stream, and is based on the principles of the HDM III and HDM 4 model.
- It was assumed that all **roads** are in a **maintainable condition** which is in line with the methodology followed at the “SADC Road Network Management and Financing Workshop Report on Road User Charges, January 1997”. Therefore no rehabilitation or backlog road maintenance was included.
- Based on the cost allocation methodology followed, the **cost responsibility** of each vehicle class in each country was determined in US cent per km based on the usage of the RTRN and the cost of maintaining the RTRN.
- Based on the current charges payable by road users in each country, the **cost recovery** in US cents per km of each vehicle class in each country was determined. The cost recovery levels were determined for all charge categories except domestic fees, as it was assumed for purposes of this study that all traffic is transit traffic or foreign traffic.
- The cost responsibility and cost recovery was compared to determine the **cost over- or under recovery** per vehicle class.

A Microsoft Excel model was developed to enable easy calculation and future updates.

1.3.3 Phase 3 – Technical solutions for collection of Charges

This phase entailed the identification and analysis of various solutions for the collection of road user charges. This was performed by investigating measurement methods for payment of charges (flat fee, distance based fee etc), payment methods (cash, credit cards, coupons etc) and collection methods (through government departments, outsourcing etc).

1.3.4 Phase 4 – Regional Implementation Plan

This phase entailed the development of recommendations on how to proceed from the status quo to the RUC system specified in the Study as well as the implementation of appropriate technical solutions for collection. Major considerations for implementation are the management of collection mechanisms, the monitoring and audit of revenues and assigning of accountability, and the continuous management of the RUC system (e.g. adjustments of RUC levels).

Based on the results of this Draft Report, a regional workshop will be organised by the Contracting Authority and funded separately from RICB resources, as required in the Terms of Reference. At this workshop, the Consultant is required to present the following:

- Draft Implementation Manual/Plan; and
- Draft Memorandum of Understanding (MoU);

The main aim of the workshop is to secure stakeholders' endorsement of the draft Implementation Manual/Plan and the draft MoU. Since these key outputs of the project would have been discussed and guided by the national public/private sector Working Groups, we do not anticipate that there would need to be major amendments to these outputs. However, the workshop will provide a good opportunity to not only bring all stakeholders together but, importantly, to solicit their support for the implementation and sustainability of the RUC system.

1.4 Outline of this Report

This Report is structured as follows:

- Chapter 1 (this Chapter) presents the introduction.
- Chapter 2 presents basic principles and the background to the analysis.
- Chapter 3 gives a review of each of the target countries in terms of the current status of road reform, the current charges levied from road users, the road financing needs of the RTRN, the usage of the RTRN and cost responsibility and cost recovery levels.
- Chapter 4 presents technical solutions for the collection of the proposed charges.

- Chapter 5 provides a summary and discussion of results.
- Chapter 6 concludes this Report and presents recommendations.

2 Principles and Background to the Analysis

The purpose of this section is to present the principles from a previous study on harmonised road transit charges that was prepared by a SATCC/SACU Joint Task Team and to present the assumptions used in this study.

2.1 Principles from Previous Study

The Report “Proposed System of Harmonised Road Transit Charges for the SADC Region (April 1997)” established a common set of principles pertaining to the following:

- Methodology for determining road transit charges;
- Determination of harmonised levels of transit charges;
- Formulation of common systems for charging and collection of revenue;
- Examination of issues associated with implementation of proposals; and
- Proposals for management of funds arising from revenues collected.

The principles on which the proposed road user charging system is based, are those agreed at the Committee of Ministers Meeting that was held in Lilongwe in January 1995, namely:

a) Non-discrimination: i.e. transit vehicles with similar characteristics and loads undertaking trips between the same origins and destinations should be treated equally in respect of the payment of road transit charges, irrespective of the country in which such vehicles are registered.

b) Equity: i.e. in the context of the proposed charging system the charges need to be fair. Fairness implies that charges should relate to the damage inflicted on roads by different classes of vehicles without cross-subsidisation, as far as is practically possible.

c) Transparency: i.e. the method of calculating the proposed charges for transit traffic, the elements thereof, and the practical levying thereof should be transparent to all participating countries.

d) Foreign operators to pay in the host country: i.e. foreign operators should pay for the use of road infrastructure in a host country.

e) Operators to pay for use: i.e. the charge to be paid by foreign vehicles in a host country should be broadly based on the cost which such vehicles impose on the road network they use in that country.

2.2 Assumptions used in this Study

The assumptions used in this study are discussed below.

2.2.1 Data

Data that was used in the study for the calculation of harmonised road user charges on the RTRN was obtained during the country visits, and should be regarded as the most accurate data that could be obtained.

The level of sophistication of the data varied extensively where some data such as traffic data, condition data and maintenance unit costs was extracted from Road Management Systems (RMS's) whereas other data is based on best estimates from officials during the country visits.

2.2.2 Charges considered

A review was done of all charges paid by road users in each member state, within the context of the conventional definition of road user charges.

The focus was then placed on charges that are payable by vehicle operators when entering a country and making use of the road network of the country. It was assumed that all traffic on a particular RTRN of a specific country is transit traffic or foreign traffic, and therefore charges that are levied from domestic vehicle operators such as annual vehicle licence fees were excluded.

All charges were categorised for a specific charge category as follows:

- **Compulsory access fees** refer to all charges that are payable at the border posts upon entering a specific country.
- **Other Fees** include fees payable on toll roads, fuel levies and fuel taxes. Tolls are currently only payable in South Africa and Mozambique. Fuel levies were included in the cases where there is a dedicated fuel levy. Fuel taxes are used as a proxy for countries who do not have a dedicated fuel levy in

order to arrive at comparable results. Regarding fuel levies and fuel taxes, it should be noted that cost recovery levels were calculated by including and excluding fuel levies and taxes, as these are not necessarily payable if there is no need to refuel in a specific country.

- **Domestic Fees** include annual vehicle licence fees that are only paid by domestic vehicles. Although fee levels were recorded where available, these fees were excluded from the calculation of cost responsibility and cost recovery as they do not apply to transit traffic.

Table 2.2.1 presents a list of the charges payable by road users in the various countries.

Table 2.2.1: List of charges payable by road users

RUC Category	Charge Type	Country											
		Ang	Bot	DRC	Les	Mal	Moz	Nam	SA	Swazi	Tan	Zam	Zim
Compulsory Access Fee	Transit Charges/Fees/Tolls	X				X	X			X	X	X	X
	Foreign Vehicle Permit Fees										X		
	Cross-Border Charges							X					
	Road Transport Permit Fees		X										
	Entry Card Fees			X									
	Insurance Fees			X									
	Container Fees			X									
	Fumigation Fees			X									
	Toll Fees**			X									
	Road Tollgate Fees**				X								
	Carbon Taxes											X	X
Surveillance Fees			X										
Domestic Fee	Annual Vehicle Licence Fees	Reviewed but not considered as only applicable to domestic vehicles											
Other Fees	Fuel Levies		X		X	X	X	X			X	X	X
	Fuel Taxes*			X					X	X			
	Tolls						X		X				

Note: * Considered as a proxy for the fuel levy. Angola does not have a dedicated fuel levy, and as the fuel price is subsidised, fuel taxes are also not applicable in Angola.

** Toll fees and road toll gate fees are levied at the border post when entering the respective country and are therefore separate from fees charged on toll roads.

3 Road Reform, Current Charges, Road Financing Needs, Network Usage, Cost Allocation and Cost Recovery

3.1 Introduction

The purpose of this section is to provide an overview of the road sector in each of the 12 continental member states of SADC. An overview was provided in terms of the institutional reform status and the current charges levied from road users.

This was followed by presenting the links forming the RTRN in each country in terms of length, surface type, traffic levels and traffic composition. The funding requirements for routine and periodic road maintenance on the identified links of the RTRN are also shown for each country.

Based on the length of the RTRN and the traffic levels, the network usage per vehicle type is shown in terms of vehicle kilometres travelled (VKT) and equivalent axle load kilometres (E80km). VKT and E80km are parameters that are used to allocate the costs to the various vehicle classes in order to arrive at the cost responsibility levels which are shown for each country per vehicle class.

The current charges that are levied from road users in each country were used to arrive at the cost recovery levels for each country.

Finally, cost responsibility levels were compared to the cost recovery levels and were subsequently presented in the form of total cost over- or under-recovery levels per vehicle class.

3.2 Angola

The roadway network covers about 75,000 km of which 7,955km are paved. The main axis links the capital with the interior (East to West). At the same time there are a number of branches that connect the main roadways with neighbouring countries, specifically with Namibia, the Democratic Republic of Congo and Zambia.

The general state of the network 6 years ago was poor, but significant improvements are being made.

3.2.1 Institutional Reform Status

The Angolan road agency (INEA) is in fact only a roads department.

Legislation for implementation of a Road Fund has already been established but not implemented yet. This is expected to happen in due course, once the major rehabilitation of the network has been completed.

3.2.2 Current Charges levied from Road Users

INEA only receives allocations from central government and donors.

3.2.2.1 Fuel levy

The fuel price is below the resource cost, which implies that there is currently no fuel levy. The table below shows the composition of the fuel price in Angola, and it will be noted that government currently subsidises the price of petrol and diesel by Kwanza 78.75 and Kwanza 36.76, respectively.

Table 3.2.1: Composition of the fuel price in Angola (Kwanza)

Product	Resource Price	Taxes	Operational /Industry Levy	Commercial /Wholesale Levy	Retail Margin	Actual Price	Pump Price	Sub-vention
Petrol	47.03	47.03	14.11	4.70	5.88	118.75	40.00	78.75
Diesel	32.08	16.04	9.62	3.21	4.81	65.76	29.00	36.76

Note: Exchange Rate of US\$ 1: Kwanza 83.90.

It should also be noted that the pump price of petrol and diesel in Angola is significantly lower than that of the other SADC countries.

3.2.2.2 Transit fees

Transit fees payable by foreign vehicles on entering Angola through the various border posts are as follows:

- Vehicles up to 2ton - 1300 AKZ (US\$ 14.53) per vehicle
- Vehicles more than 2 tons - 2400 AKZ (US\$ 26.83) per vehicle.

3.2.3 RTRN and Financing Needs

3.2.3.1 Extent of the RTRN

A map showing the RTRN in Angola is presented in Figure 3.2.1 and Table 3.2.2 shows the characteristics of the RTRN.



Figure 3.2.1: Angola RTRN Map

Table 3.2.2: Extent of the Regional Trunk Route Network in Angola

RTRN Section Number	Origin	Destination	Surface Type (Paved/Unpaved)	Length	AADT	% Vehicle Split				
				(km)		% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6 + HV
SADC 05	Namibia Border (Namacunde)	Ondjiva-Lubango	Paved	503	200	40%	5%	18%	18%	19%
SADC 05	Lubango	Huambo-Alto Hama	Paved	385	100	40%	5%	18%	18%	19%
SADC 05	Alto Hama	Uaco Cungo-Quibala-Dondo-Catete-Luanda	Paved	533	500	90%	2%	2%	3%	3%
SADC 05	Luanda	Nzeto	Paved	303	100	40%	5%	18%	18%	19%
SADC 102	Nzeto	Soyo-Cabinda Enclave	Unpaved	205	100	40%	5%	18%	18%	19%
SADC 05	Nzeto	Mepala	Paved	82	50	40%	5%	18%	18%	19%
			Unpaved	110	50	40%	5%	18%	18%	19%
SADC 103	Mepala	DRC Border (Matadi)	Unpaved	60	50	40%	5%	18%	18%	19%

RTRN Section Number	Origin	Destination	Surface Type (Paved/Unpaved)	Length	AADT	% Vehicle Split				
				(km)		% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6 + HV
SADC 05	Mepala	DRC Border (Luvo)	Unpaved	88	50	40%	5%	18%	18%	19%
SADC 30	Namibe	Lubango	Paved	177	300	40%	5%	18%	18%	19%
SADC 30	Lubango	Menongue-Cuito Cuanavale-Nankova- Luengue-Muine- Namibia Border (Mucusso)	Paved	350	200	40%	5%	18%	18%	19%
			Unpaved	1000	100	40%	5%	18%	18%	19%
SADC 20	Lobito	Benguela	Paved	27	8000	70%	3%	8%	9%	10%
SADC 20	Benguela	Alto Hama	Paved	150	100	40%	5%	18%	18%	19%
SADC 20	Alto Hama	Bailundo-Luena	Unpaved	540	100	50%	3%	15%	15%	17%
None	Luena	Saurimo	Unpaved	254	100	50%	3%	15%	15%	17%
SADC 104	Saurimo	Lucapa-DRC (Chitato)	Unpaved	264	50	50%	3%	15%	15%	17%
None	Luena	Luau-DRC Border (Dilolo)	Unpaved	334	50	50%	3%	15%	15%	17%

RTRN Section Number	Origin	Destination	Surface Type (Paved/Unpaved)	Length	AADT	% Vehicle Split				
				(km)		% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6 + HV
SADC 20	Luena	Zambia Border (Caripande/Chavuma)	Unpaved	393	20	75%	0%	25%	0%	0%
SADC 104	Dondo	Ndalandando-Lucala- Malange-Cacolo- Saurimo	Unpaved	883	150	50%	3%	15%	15%	17%
None	Lucala	Camabatela-Negage- Damba-DRC Border (Banza Sosso)	Unpaved	455	100	50%	3%	15%	15%	17%
Total				7096	172	58.77%	3.49%	12.09%	12.32%	13.33%

3.2.3.2 Financing needs

In order to estimate the financing needs of the RTRN in Angola, unit costs per kilometre for routine and periodic maintenance for paved and unpaved roads were applied¹, and were based on unit costs in Namibia and adjusted for Angola by comparing recent construction costs of the two countries. Based on the unit costs, the total annual funding requirements are shown in Table 3.2.3.

Table 3.2.3: Angola Total Annual Funding Requirements (US\$)

Activity	Type		Total
	Paved	Gravel	
Routine	16,252,212	2,633,983	18,886,195
Periodic	9,317,360	15,913,244	25,230,604
TOTAL	25,569,572	18,547,228	44,116,799

3.2.4 Road Network Usage

No comprehensive traffic information on the network exists. Based on estimates the road network usage in terms of vehicle kilometres travelled (VKT) is shown in Table 3.2.4 and in terms of E80 kilometres (E80km) in Table 3.2.5.

Table 3.2.4: Angola Road Network Usage Per Vehicle Type (VKT Million)

Road Type	Annual vehicle kilometres traveled (VKT) by Vehicle Class (VKT million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	TOTAL
Paved	188.23	10.00	28.72	30.49	32.41	289.85
Unpaved	74.05	5.58	25.21	24.49	27.08	156.41
TOTAL	262.28	15.58	53.93	54.98	59.49	446.25

Table 3.2.5: Angola Road Network Usage Per Vehicle Type (E80km Million)

Road Type	Annual E80 kilometres traveled (E80km) by Vehicle Class (E80km million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	TOTAL
Paved	0.00	13.90	40.21	85.06	135.80	274.97
Unpaved	0.00	7.76	35.29	68.33	113.44	224.82
TOTAL	0.00	21.65	75.51	153.39	249.25	499.80

¹ It should be noted that virtually no maintenance is carried out on Angolan roads at present, as most roads need to be reconstructed first.

3.2.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network, Table 3.2.6 shows the cost responsibility in US cent per km. Based on the current charges payable by vehicles, the third column shows the cost recovery from vehicles, and cost responsibility and cost recovery levels are compared by presenting the total over or under recovery in US cents per km in the fourth column.

It will be noted that for all other vehicle classes, the cost responsibility exceeds the cost recovery.

Table 3.2.6: Angola Total Cost Responsibility, Cost Recovery and Cost Over- (Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)	Cost Over (Under) Recovery (US cent/km)
LV	1.57	0.20	(1.37)
BUS	9.61	0.38	(9.24)
2-3 HV	15.06	0.38	(14.68)
4-5 HV	22.91	0.37	(22.54)
6 & 6+ HV	29.88	0.38	(29.51)
Weighted Average	9.89	0.28	(9.61)

3.2.6 Summary

The upgrading of the main network is currently ongoing, and therefore little data is currently available in terms of condition and traffic data pertaining to the RTRN in Angola. Assumptions had therefore to be made and the calculations are based on the data which is available.

The total RTRN of Angola comprises almost 8 000km of which only about 35% is paved. The average traffic levels on the RTRN are low at 172 vehicles per day. The total annual funding requirement for routine and periodic maintenance on the RTRN amounts to about US\$ 44 million per annum.

3.3 Botswana

The Public Highway Network (PHN) of Botswana currently consists of some 18,327 km of roads which have been classified on a functional basis into four categories, namely Primary, Secondary, Tertiary and Access roads. Responsibility for management of the PHN is shared between Central Government (administered by the Roads Department) and Local Government (administered by the Town and District Councils). In addition to the 18,327 km of roads which constitute the PHN, there are some 3,173 km of primary and secondary roads and streets in urbanised areas (city, towns and villages) which are the responsibility of the City, Town or District Councils. There are also some 15,000 km of access tracks, quasi-private roads, minor tracks, driveways, car parks, etc. Thus, the total length of the road network in Botswana is approximately 36,500 km.

3.3.1 Institutional Reform Status

Central Government operations in the transport sector fall under the Ministry of Works and Transport, which is the parent ministry for a number of departments including Roads Department, and the Ministry of Local Government, which is the parent ministry for the Local Authorities (see Figure 3.3.1).

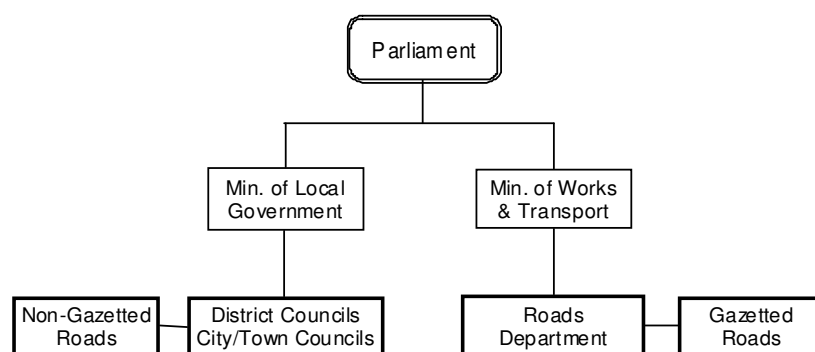


Figure 3.3.1: Botswana Public Roads Organisation

Responsibility for administering roads is shared between the Roads Department, which maintains gazetted roads, the District Councils which maintain non-gazetted rural roads and the City or Town Councils which are responsible for urban roads within their administrative boundaries.

An Institutional Study of Botswana Road Agencies was carried out in 1998 with the main objectives of identifying a range of potential options available to the various road agencies in Botswana and recommending the most suitable format for the overall management of the Public Highway Network.

The main Study recommendations were that:

- The then Ministry of Works, Transport and Communications (now the Ministry of Works and Transport) should be the lead ministry responsible for roads that represent the public interests, be the regulatory authority and oversee long-term planning and policy development.
- The then Ministry of Local Government, Lands and Housing (now the Ministry of Local Government) to participate in planning of new roads and upgrading at local level;
- Establishment of a Roads Board as an autonomous, representative, stakeholder-based body with overview responsibility for the entire road sector;
- Establishment of an autonomous, parastatal Roads Authority to be responsible for managing all roads sector activities related to primary and secondary roads;
- Establishment of Regional Offices of the Road Authority for carrying out their assigned activities.
- Establishment of a Road Fund that would receive funds from road user charges and government budget, and distribute funds to the road sector agencies
- Local Councils, through the Local Road Units, to be responsible for management of tertiary, access, urban and other local roads and participate in the development planning for local roads.

The recommendations of the Institutional Study have however not been implemented yet.

3.3.2 Current Charges Levied from Road Users

The existing tax structure provides for several fees and charges that are levied from road users, although only one of them is specifically and clearly defined as a road user charge. The purpose of these fees is to generate revenue for use by the collecting agency. The application of the revenue from these fees is not directly traceable as the proceeds of all of these fees and charges are not at present dedicated to specific uses, but are paid into general revenue funds, which are then used for general expenditure.

3.3.2.1 Motor vehicle registration fees

Motor vehicle registration fees are charged in terms of the Road Traffic Act, 1975 as amended by the Road Traffic (Amendment) Regulations, 2004. In terms of the Act, motor vehicle registration fees are charged whenever a motor vehicle is registered, or re-registered on change of ownership. The fees are designed principally to cover the costs of maintaining and administering the motor vehicle register. The present fee levels are dependent on the unladen or tare weight of the vehicle and are shown below.

Table 3.3.1: Motor Vehicle Registration fees

Item	Unladen weight (kg)	Fees in Pula
Original registration	0-680	50.00
	618-1133	80.00
	1134-1815	90.00
	1816-2711	120.00
	2723-3629	145.00
	3630-4536	185.00
	4537-5443	210.00
	5444-6340	250.00
	6351-7527	290.00
	7528 and above	340.00
On transfer of ownership	All motor vehicles	130.00
Duplicate registration book	All motor vehicles	65.00

3.3.2.2 Annual motor vehicle license fees

Motor vehicle license fees are charged in terms of the Road Traffic Act 1975 as amended by the Road Traffic (Amendment) Regulations, 2004. The fees are charged annually and must be paid to obtain the right to operate a vehicle on the public road system. This is enforced by means of a license disc that must be displayed on the vehicle. Operating a vehicle on a public road without this disc is an offence that is punishable by a fine or imprisonment.

The motor vehicle license fees are intended as a mechanism for recovering administrative costs and road infrastructure costs from road users. However, there is no formal relationship between the amounts paid and collected, and the costs incurred in road use.

The license fees vary according to the type of vehicle and according to the unladen mass of the motor vehicle. The fees for self-propelled motor vehicles (motor cycles and motor vehicles), trailers and license charges are shown below.

Table 3.3.2: Annual Motor Vehicle License fees for Motor Cycles and Self-propelled Vehicles

Item	Unladen Weight (kg)	Fee in Pula
(i) Motor cycle (without side car)	All	65.00
(ii) Motor cycle (with side car)	All	80.00
(iii) Motor vehicle other than motor cycle	0-680	80.00
	681-1133	105.00
	1134-1815	155.00
	1816-2722	195.00
	2723-3629	325.00
	3630-4082	480.00
	4083-4536	600.00
	4537-5443	935.00
	5444-6350	1120.00
	6351-7257	1315.00
	7258-8165	1495.00
	8166-9070	1690.00
	9071-9979	1875.00
9980-10886	2055.00	
10887 and over	2250.00	

Table 3.3.3: Annual Motor Vehicle License fees for Trailers

Item	Unladen Weight (kg)	Fee in Pula
Trailers	0-680	40.00
	681-1133	50.00
	1134-1815	90.00
	1816-2722	155.00
	2723-3629	445.00
	3630-4082	675.00
	4083-4536	795.00
	4537-5443	935.00
	5444-6350	1120.00
	6351-7257	1315.00
	7258 and over	1495.00
(iv) Tractors (incl. farm tractors)	All	100.00

3.3.2.3 Permit Fees

Road transport permits are issued in terms of the Road Transport (Permits) Act, as amended by the Road Transport Regulations, 2004 published on 13th February, 2004. The Permit fees are determined according to the gross vehicle mass or weight of the vehicle concerned, and at present differ for Botswana operators and "Transit" operators. Further to Road Transport

(Permits) Act, Botswana is a signatory to the Southern African Customs Union (SACU) Memorandum of Understanding on Road Transport (MoU), which provides for permits for cross border transport among SACU member states. Both the Act and the MoU provide for the charging of fees. The MoU provides specifically for administrative fees, and for fees to recover road infrastructure costs. In practice, road transport permit fees are set at a level to recover administrative costs and to contribute to infrastructure costs.

The permit fees for Botswana operators as well as for foreign or “transit” operators are shown below.

Table 3.3.4: Permit Fees for Road Transport Permits for Botswana Operators (Pula)

Gross weight of vehicle & load in kg	Single	3 Months	Annual
Less than 3500 (including cars, vans, mini buses up to 15 seats)	40.00	400.00	1200.00
3500-4500	60.00	600.00	1800.00
4501 – 6500	80.00	800.00	2400.00
6501- 8500 (including midi-buses 16-30 seats)	100.00	1000.00	3000.00
8501-10500	120.00	1200.00	3600.00
10501-12500	140.00	1400.00	4200.00
12501-14500	150.00	1500.00	4500.00
14501-16500 (including midi-buses 31-65 seats)	160.00	1600.00	4800.00
16501-18500	170.00	1700.00	5100.00
18501-20500	180.00	1800.00	5400.00
20501-22500	190.00	1900.00	5700.00
22501-24500	200.00	2000.00	6000.00
24501-26500 (including buses above 65 seats)	220.00	2200.00	6600.00
26501-28500	240.00	2400.00	7200.00
28501-30500	280.00	2800.00	8400.00
30501-32500	300.00	3000.00	9000.00
32501-34500	340.00	3400.00	10200.00
34501-36500	360.00	3600.00	10800.00
36501-38500	390.00	3900.00	11700.00
38501-40500	420.00	4200.00	12600.00
40501-42500	440.00	4400.00	13200.00
42501-44500	460.00	4600.00	13800.00
44501-46500	480.00	4800.00	14400.00
46501-48500	500.00	5000.00	15000.00
48501-50500	530.00	5300.00	16500.00

Table 3.3.5: Permit Fees for Road Transport Permits for Transit Operators (Pula)

Gross weight of vehicle & load in kg	Single	Return	3 Months	Annual
Less than 3500 (including cars, vans, mini buses up to 15 seats)	50.00	90.00	500.00	1500.00
3501-4500	70.00	130.00	700.00	2100.00
4501-6500	90.00	160.00	900.00	2700.00
6501-8500	110.00	200.00	1100.00	3300.00
8501-10500	130.00	230.00	1300.00	3900.00
10501-12500	150.00	270.00	1500.00	4500.00
12501-14500	160.00	290.00	1600.00	4800.00
14501-16500	180.00	320.00	1800.00	5400.00
16501-18500	190.00	340.00	1900.00	5700.00
18501-20500	200.00	360.00	2000.00	6000.00
20501-22500	220.00	400.00	2200.00	6600.00
22501-24500	240.00	430.00	2400.00	7200.00
24501-26500	260.00	470.00	2600.00	7800.00
26501-28500	280.00	500.00	2800.00	8400.00
28501-30500	300.00	540.00	3000.00	9000.00
30501-32500	330.00	600.00	3300.00	9900.00
32501-34500	360.00	630.00	3600.00	10800.00
34501-36500	390.00	700.00	3900.00	11700.00
36501-38500	420.00	760.00	4200.00	12600.00
38501-40500	450.00	810.00	4500.00	13500.00
40501-42500	480.00	860.00	4800.00	14400.00
42501-44500	520.00	940.00	5200.00	15600.00
44501-46500	580.00	1050.00	5800.00	17400.00
46501-48500	620.00	1120.00	6200.00	18600.00
48501-50500	660.00	1200.00	6600.00	19800.00

Figure 3.3.2 shows the difference in permit fees payable by Botswana and Foreign Operators for a single permit.

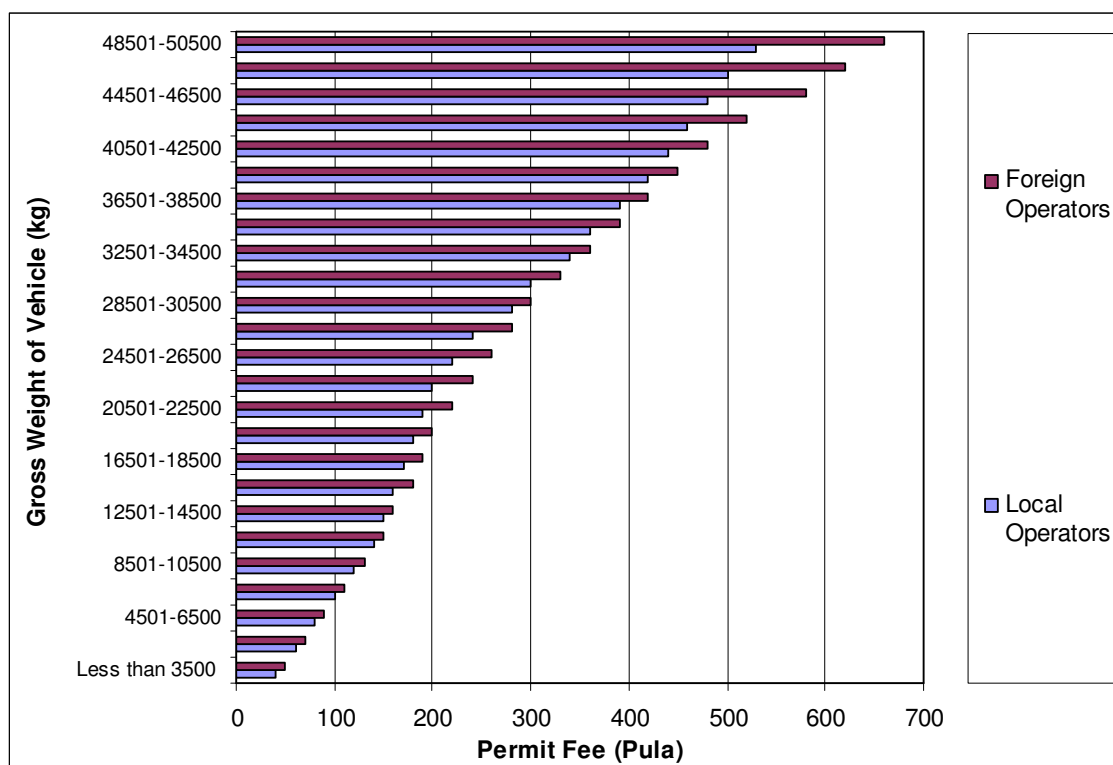


Figure 3.3.2: Difference in Permit Fees payable by Botswana and Foreign Operators

It is evident that there is a discrepancy, as foreign operators pay more than domestic operators.

3.3.2.4 Fuel levies

Fuel levies are charged in terms of the Control of Goods, Prices and Other Charges Act, which is amended from time to time to reflect changes in the fuel prices (due to both crude oil price changes and exchange rate fluctuations). The full breakdown of the fuel price in April 2006 is shown below.

Table 3.3.6: Botswana Fuel Price Breakdown in Thebe per litre (April 2006)

Item	Petrol	Diesel
Pump Prices	402.000	400.000
Less: Dealers Margin	31.300	31.300
Wholesale selling price	370.700	368.700
Less: SALES TAX	0.000	0.000
DUTY (at customs rate)	3.552	3.552
- Fuel Levy	21.000	12.000

Item	Petrol	Diesel
- Road Fund	0.500	0.500
- MVA Levy	9.500	9.500
- National Petrol Fund Levy	6.000	6.000
- Depot Storage & Handling	4.600	4.600
- Road Delivery	6.000	6.000
- Grid Differential	4.600	4.600
- IMPORT PARITY GABORONE	330.802	343.018
- Industry Margins	28.300	28.300
Unit Over/(Under) Recovery c/litre (BFP Basis)	(44.154)	(49.370)

The MVA levy is charged to fund the Motor Vehicle Accidents Fund, which provides third party insurance cover for all vehicles travelling on the road. The National Petrol Fund levy is charged to stabilise prices charged by the Oil Industry, meet insurance premiums in respect of Government's strategic oil installations and stocks, and meet engineering, construction and operating costs of strategic storage facilities for Government. The Road Fund Levy was established to provide funds for maintenance of roads. The funds collected are deposited into a special fund account, and administered by the Ministry of Commerce and Industry, pending the establishment of a Road Fund by the Ministry of Works Transport and Communications. The establishment of the Road Fund is under consideration by Ministry of Works Transport and Communication and the Ministry of Finance and Development Planning at this time.

There is a rebate system, administered by the Department of Customs and Excise on behalf of other Ministries and agents, whereby users who do not use the fuel for road purposes can avoid paying certain of the levies. This system requires applicants wishing to obtain rebates to register as a particular category of user, and to keep certain records and invoices, so as to be able to claim rebates on a rational basis. The rebates are granted in terms of Section 81 of the Customs and Excise Duty Act, 1950, which authorises rebates according to a Tariff Schedule. Rebates of certain amounts are granted to persons using fuel for the following purposes:

- agricultural or forestry production (Tariff Code 609)
- road or rail transport of agricultural or forestry products (Tariff Code 609)
- ships and trawlers used in ocean fishing (Tariff Code 86/7)
- vehicles and drilling machines underground (mining) (Tariff Code 87.02)
- vehicles, lift trucks and other industrial equipment used on private property (Tariff Code 84/85)

- machinery such as compressors and earth moving equipment not used on the road (Tariff Code 84/85)
- locomotives (Tariff Code 86.02)
- boilers, furnaces, stationary turbines and other stationary power plants (Tariff Code 73/74/76/84/84.06)
- diplomatic reasons

The pump price of fuel is adjusted regularly to accommodate changes in the import parity price, which result from fluctuations in the price of crude oil, as well as the US\$/Pula exchange rate. At less regular intervals the levies and taxes are adjusted.

3.3.2.5 Abnormal Load Fees and Overload Charges

Abnormal load permit fees are charged when a load that cannot be broken down into smaller sections is either too large or too heavy to carry legally on a normal combination of motor vehicles. In this case an application is made for a permit to operate a vehicle on the public road, contrary to the relevant provision of the Road Traffic Act.

If a heavy vehicle is weighed at a weighbridge and is found to be overloaded, then in addition to any criminal prosecution and fine that may need to be paid, an infrastructure charge based upon the abnormal permit fee multiplied by the distance the overloaded vehicle has travelled, is levied on the operator of that vehicle.

3.3.2.6 Other Charges

Other charges imposed on certain categories of road users can also be considered. These are miscellaneous fees, taxes on vehicle sales, sale of spare parts and tyres, local authority taxes and abnormal load fees.

Miscellaneous fees include motor dealer's licence fees, driving licence testing fees and vehicle testing fees.

Motor dealers are charged licence fees in terms of the Road Traffic Act, and once licensed, they are granted certain concessions in regard to vehicle registration and licensing, to allow their businesses to operate smoothly. The motor dealer's licence is renewed annually. The levels of these fees are shown below.

Table 3.3.7: Motor Dealers Vehicle License fees charges

Item	Amount in Pula
Duplicate license	10% of Annual fees
Motor dealer's licence (new and used)	2600.00
Motor dealer's licence (used only)	1300.00
Renewal of motor dealer's licence (new and used)	2600.00
Renewal of motor dealer's licence (used only)	1300.00
Transfer of motor dealer's licence (new and used)	2600.00
Transfer of motor dealer's licence (used only)	1300.00
Number Plate Manufacture (1st year)	1950.00
Renewal	650.00
Motor Vehicle Registration: Cancellation Certificate	50.00
Temporary Motor Vehicle licence (Export)	80.00
Authorisation (Local Temporary Motor vehicle licence)	50.00

Fees relating to the testing of drivers and vehicle and other miscellaneous fees are also charged in terms of the Road Traffic Act. These fees are charged to specific sub groups of the road users, usually for specific purposes. The current fees are shown below.

Table 3.3.8: Driver Testing and Vehicle Testing Fees

Item	Amount in Pula
(a) Driving test	
(i) Theory	40.00
(ii) Practical	40.00
(b) Certificate of road worthiness	
(i) Mini-bus (11 up to 15 seats without driver)	130.00
(ii) Midi-bus (15 up to 30 seats without driver)	130.00
(iii) Bus (30 up to 100 seats without driver)	260.00
(iv) Train-bus and double deck bus (above 100 seats)	260.00

3.3.3 RTRN and Financing Needs

3.3.3.1 The RTRN

Botswana's component of the SADC RTRN consists of seven main routes totalling some 2832 km of primary roads which provide connectivity to the surrounding countries of South Africa, Namibia, Zambia and Zimbabwe. A map showing the RTRN in Botswana is presented in Figure 3.3.3. The characteristics of the RTRN are presented in Table 3.3.9.



Figure 3.3.3: Botswana RTRN Map

Table 3.3.9: Botswana's RTRN

Road Section Number	RTRN Section Number	Origin	Destination	Road Surface Type (Paved/Unpaved)	Condition (Excellent, Good, Fair, Poor, Bad)	Length (km)	AADT	% Vehicle Split				
								% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
A1	SADC36	RamatlabamaBp	Lobatse	Paved	Good	50	438	67	9.5	16	0.7	6.8
A1	SADC36	Lobatse	Boatle	Paved	Good	53	1925	65.6	4.5	26.1	0.7	3.1
A1	SADC36	Boatle	Gaborone	Paved	Good	25	3830	71.7	5.1	19.6	0.8	2.8
A1	SADC36	Gaborone	Rasesa	Paved	Good	34	3830	71.7	5.1	19.6	0.8	2.8
A1	SADC36	Rasesa	Dibete	Paved	Good	81	2224	68	6.4	20.6	1.1	3.9
A1	SADC36	Dibete	Mahalapye	Paved	Fair	77	2224	68	6.4	20.6	1.1	3.9
A1	SADC36	Mahalapye	Palapye	Paved	Good	75	2482	64.5	7.9	21.7	1.2	4.7
A1	SADC36	Palapye	Dikabeya	Paved	Good	74	1981	64.6	7	22.6	1.1	4.7
A1	SADC36	Dikabeya	Serule (selebi/ phikwe T.off)	Paved	Good	55	1715	65.1	7.4	20.7	1.1	5.7
A1	SADC36	Serule (selebi/ phikwe T.off)	Tonata Jn.	Paved	Good	58	1995	65.6	6.7	18.5	1.1	8.1
A1	SADC36	Tonata Jn.	Francistown	Paved	Good	30	1995	65.6	6.7	18.5	1.1	8.1
A1	SADC36	Francistown	Vikaranga Bp.	Paved	Fair	80	871	60.4	14.1	22.3	1	2.2
A2	SADC40	Pioneer gate Bp	Lobatse	Paved	Good	8	786	67.6	1.5	21.5	1	8.4
A2	SADC40	Lobatse	Kanye	Paved	Good	50	1742	69.9	5.9	22.2	0.8	1.2
A2	SADC40	Kanye	Jwaneng	Paved	Good	74	850	58.3	6.9	28.6	1.5	4.7
A2	SADC40	Jwaneng	Kang	Paved	Good	240	683	49.2	5	37.3	1.8	6.7
A2	SADC40	Kang	Mamuno T.off	Paved	Good	221	213	34.3	5.2	40	3.3	18.2

Road Section Number	RTRN Section Number	Origin	Destination	Road Surface Type (Paved/Unpaved)	Condition (Excellent, Good, Fair, Poor, Bad)	Length (km)	AADT	% Vehicle Split				
								% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
A2	SADC40	Mamuno T.off	Mamuno Bp	Paved	Good	164	256	36	4.7	45.7	1.5	12.1
A3	SADC303	Francistown	Sebina T.off	Paved	Good	52	1454	53.3	14.5	27.6	1.4	3.2
A3	SADC303	Sebina T.off	Sowa Jn.	Paved	Fair	91	744	51.2	8.5	33.6	1.3	5.4
A3	SADC303	Sowa Jn.	Nata	Paved	Fair	47	424	42	6.8	37.7	1.9	11.6
A3	SADC303	Nata	Motopi Jn.	Paved	Good	220	550	46.9	7.6	37.3	1.6	6.6
A3	SADC303	Motopi Jn.	Maun	Paved	Good	82	846	43.7	5.6	44.1	1.9	4.7
A3	SADC303	Maun	Sehitwa	Paved	Good	98	332	38.7	7.5	48.1	2.4	3.3
A3	SADC303	Sehitwa	Ghanzi	Paved	Good	188	205	38.7	3.9	52.1	2.4	2.9
A3	SADC303	Ghanzi	Mamuno T.off	Paved	Good	44	363	33.9	4.1	57	1.7	3.3
A33	SADC301	Nata	Pandamatenga	Paved	Fair	199	323	33.7	5.6	43.9	2.2	14.6
A33	SADC301	Pandamatenga	Kazungula Jn.	Paved	Good	99	297	31.3	6.1	45.1	2.4	15.1
A33	SADC301	Kazungula Jn.	Ngoma bridge BP	Paved	Good	65	181	30.4	7.2	53	2.2	7.2
A331	None	Kasane	Zimbabwe	Paved	Good	2	347	39.2	16.1	40.6	0.6	3.5
A332	None	Kasane	Zambia	Paved	Good	1.7	424	35.9	16.3	36.3	1.4	10.1
A35	SADC34	Sehitwa	Tasu	Paved	Fair	43	338	29.9	8.9	56.5	2.9	1.8
A35	SADC34	Tasu	Mohembo Bp	Paved	Good	254	338	29.9	8.9	56.5	2.9	1.8
TOTAL						2934.7	828	46.23	6.72	38.10	1.87	7.07

As a landlocked country, all of the RTRN routes terminate at the border posts of the surrounding countries.

3.3.3.2 Financing Needs

Based on typical levels of routine and periodic maintenance costs for the corridors on the RTRN, the total annual funding requirements are indicated in Table 3.3.10.

Table 3.3.10: Botswana Total Annual Funding Requirements (US\$)

Activity	Type
	Paved
Routine	3,998,766
Periodic	6,845,713
TOTAL	10,844,479

3.3.4 Road Network Usage

It is apparent from Table 3.3.9 that, apart from the A1 route on which traffic levels range between about 2000 and 4600 vehicles per day, traffic levels on the other routes are all less than 1000 vehicles per day, most of which (70- 75%) is comprised of light vehicles.

Table 3.3.11 and Table 3.3.12 present the use of the road network made in terms of vehicle kilometres travelled (VKT) and E80 km travelled by the five vehicle classes used in the RUC system.

Table 3.3.11: Botswana Road Network Usage Per Vehicle Type (VKT Million)

Road Type	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	480.46	58.73	245.37	12.00	45.58	842.14
Unpaved	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	480.46	58.73	245.37	12.00	45.58	842.14

Table 3.3.12: Road Network Usage per Vehicle Type (E80 km Million)

Road Type	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	81.63	343.52	33.48	191.00	649.62
Unpaved	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	81.63	343.52	33.48	191.00	649.62

3.3.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network, the current charges payable by vehicles, Table 3.3.13 shows the cost responsibility and cost recovery from vehicles in US cents per km. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery for fuel levies included and excluded, respectively.

It will be noted that there is only a marginal difference between the cost over or under recovery levels if the fuel levy is included or excluded. This can be attributed to the fact that the fuel levy in Botswana is very small.

It will also be noted that the cost recovery exceeds the cost responsibility in the case of light vehicles (LV). For all other vehicle classes, the cost responsibility exceeds the cost recovery.

Table 3.3.13: Botswana Total Cost Responsibility, Cost Recovery and Cost Over-(Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.21	0.33	0.32	0.12	0.11
BUS	1.78	1.21	1.17	(0.57)	(0.61)
2-3HV	2.34	1.33	1.30	(1.01)	(1.04)
4-5HV	4.02	2.66	2.62	(1.35)	(1.40)
6&6+HV	5.62	4.33	4.27	(1.29)	(1.34)
Weighted Average	1.29	0.94	0.91	(0.35)	(0.37)

3.3.6 Summary

The RTRN in Botswana consists of about 2800 km of which 100% is paved. The average traffic levels on the RTRN are relatively high at about 830 vehicles per day. The annual requirement for the financing of routine and periodic maintenance on the RTRN amounts to about US\$ 10.85 million per annum.

3.4 DR Congo

The Public Highway Network consists of approximately 152,400 km of roads of which 58,385 km are national and provincial roads, 86,615 km are local (tertiary and access) roads and 7,400 km are urban roads.

Due largely to the previous political unrest in the country, the state of the national road network has been described as being “catastrophic” with almost 66% of the network being bad condition. The situation is even worse with local roads of which approximately 85% are reported to be in poor condition or impassable, especially in the rainy season.

3.4.1 Institutional Reform Status

Government operations in the roads sector fall under two different Ministries: the Ministry of Public Works and Infrastructure which is responsible for transport infrastructure, and the Ministry of Transport which is responsible for transport services. These ministries have delegated responsibility for the public highway network to a number of separate entities as indicated in Figure 3.4.1.

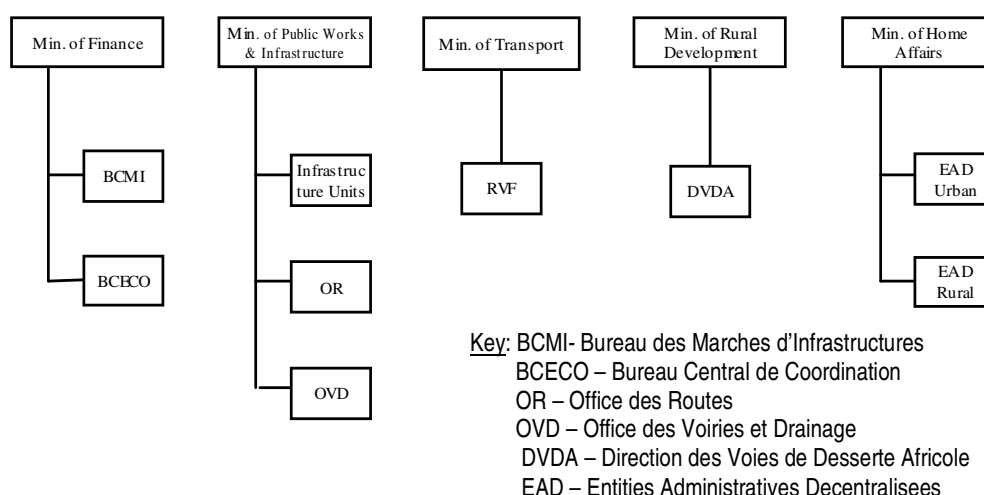


Figure 3.4.1: DRC Organisation of Road Sector Responsibilities

The reform process in the DRC is guided by the so-called Reform Pillars which, in principle, are similar to the four building blocks of the Road Management Initiative: DRCs four reform pillars are as follows:

- Pillar No. 1: Specific organisational arrangements in the roads sector(as illustrated in Figure 2.3.1);
- Pillar No. 2: Clear definition of responsibilities for the various tiers of the road network;
- Commercial management of the roads sector
- Securing regular and sufficient funding for the road network.

3.4.2 Current Charges Levied from Road Users

A dedicated Road Fund was established in 1989 which provided for the levying of a charge on the consumption of fuel products (fuel and gasoline). The revenue collected was allocated to the maintenance of road infrastructure. However, this system was abolished in 1992 when the fuel charge incomes were no longer dedicated for road maintenance. It is noteworthy, however, that the government of DRC is again considering the creation of a new Road Fund for which a study was completed in December 2005. The study has recommended the establishment of a Road Fund and oversight executive board and has identified the following sources of road user revenue for road maintenance:

- Charges on fuel products
- Commercial vehicle charges (axle load related)
- Road and bridge tolls
- Fines
- International transit charges

The study also stipulates that only roads in maintainable condition will be the beneficiary of support from the Road Fund. This will require that a substantial backlog of road rehabilitation will first have to be undertaken on the main road network before its component links become eligible for maintenance funding from the Road Fund.

Although there is no Road Fund currently in operation in DRC, a number of road user charges are levied.

3.4.2.1 Taxes on fuel products

The various taxes levied on fuel products are governed by Law No. 010/03 of 18 March 2003 and are shown with details of the breakdown of the fuel price structure given in Table 3.4.1.

Table 3.4.1: Fuel price structure (US \$) (applicable at 25th April, 2006)

Item	Petrol			Diesel		
	West	East	South	West	East	South
1. Commercial PMF	545	861.9	905	563.69	861.9	905
2. Fees and services SOCIR	30.9	0	0	30.9	0	0
3. Running cost SEP	122.36	80	58.33	122.36	80	58.33
4. Running cost Commercial firms	66.04	25	39.74	51.24	25	36.69
5. Margins commercial companies	54.5	86.19	90.5	56.37	86.19	90.5
6. Total distribution cost	273.79	191.19	188.57	260.86	191.19	185.51
7. PMF taxes	148.17	279.89	609.08	89.22	235.47	532.47
8. Consumer right	37.04	69.97	152.27	22.3	58.87	133.12
9. Entrance right(10% commercial PMF)	54.5	86.19	90.5	56.37	86.19	90.5
10. Tax on turnover(13%(PMFC+DE)	77.94	123.25	129.42	80.61	123.25	129.42
11. Total taxes(8+9+10)	169.48	279.41	372.18	159.28	268.31	353.03
12. Real reference price(US\$/M3)	988.27	1 332.50	1 465.75	983.83	1 321.40	1 443.55
13. Price to be applied (US\$/Liter)	0.99	1.33	1.47	0.98	1.32	1.44

By applying an average to the level of the PMF taxes applicable in the three regions (west, east and south), it can be derived from Table 3.4.1 that the fuel tax on petrol and diesel amounts to 34.6 US cents per litre and 28.5 US cents per litre, respectively.

3.4.2.2 Annual Vehicle Licence Fees

Vehicle license fees for goods vehicles vary in relation to the carrying capacity of the vehicle and for passenger vehicles vary in relation to the passenger carrying capacity as follows:

(i) Goods Vehicles

Carrying Capacity	Amount
0-2.5 tons	12 US\$
2.5-10 tons	25 US\$
More than 10 tons	35 US\$

(ii) Passenger Vehicles

Carrying Capacity	Tourism Vehicles	Other
1-10 passengers	12 US\$	6 US\$
11-15 passengers	25 US\$	11 US\$
More than 15 passengers	35US\$	12 US\$

3.4.2.3 International transit and toll fees

Commercial vehicles entering DRC are subject to various entry fees as follows:

Type of Levy	From 2 – 3 axle truck (US \$)	Small vehicle (US \$)
Entry card	65.00	25.00
Insurance* (2 days)	60.00	37.00
Insurance* (7 days)	90.00	70.00
Container fee	40.00	-
Fumigation	50.00	50.00
Toll fee	300.00	100.00

Note: *If the vehicle has a COMESA yellow card insurance, then additional insurance is not required.

3.4.2.4 Surveillance Fees:

Foreign vehicles (light and heavy vehicles) entering the DRC are also subject to surveillance fees with the following levels:

Weight	Amount Payable (US\$)
0-10 tonnes	10.00
10 tonnes and above	20.00

3.4.3 RTRN and Financing Needs

3.4.3.1 The RTRN

DRC's component of the SADC RTRN was recently agreed upon between with the objective of providing the most direct links with Zambia and Angola. The RTRN is some 8,370 km in length and comprises the following main corridors:

- Route RN1: Yema-Matidi-Kinshasa-Kikwit-Kananga-Mbuji-Mayi-Kamima-Likasi-Lubumbashi-Kasumbalesa: Total = 3.875 km.
- Route RN2: Mbuji-Mayi-Kabinda-Kasongo-Kalole-Kamituga-Bukavu: Total = 956 km.
- Route RN5: Bukavu-Uvira-Fizi-Kalemie-Pweto-Petro-Lubumbashi-Kipushi: Total = 2,586 km.
- Various link roads: 953 km.

The location of the RTRN links in the DR Congo is shown in Figure 3.4.2.

The various links that comprise the RTRN are shown in Table 3.4.2 from which it is apparent that:

- Almost 60% of the network is in poor condition. In fact, the DRC government has compiled a list of projects for donor funding which include almost the entire RTRN. Thus, this backlog rehabilitation will need to be completed before the roads can be brought to maintainable condition for funding via the road fund.
- Less than 20% of the network is currently paved.
- No recent traffic counts are available, with the last comprehensive count being carried out in 1986. Some limited counts were carried out on the RN1 in 2002. None of the counts provide a breakdown of the ADT by vehicle type.

Even given increases in traffic flow since the last counts were carried out, many of the links in the network probably carry less than 100 vehicles per day, with very few probably carrying in excess of 500 vehicles per day.



Figure 3.4.2: DR Congo RTRN Map

Table 3.4.2: DR Congo RTRN

DRC Route No.	SADC Route No.	Origin	Destination	Length (km)	Paved (km)	Unpaved (km)	Road Surface Type (Paved/Unpaved)	Road Condition				AADT		
								Very Good	Good	Fair	Poor	1986	2002	2004
RN1		Banana	Moanda	9	9	0	Paved		9			127	68	
RN1		Moanda	Boma	106	0	106	Unpaved		37		69	127	68	
RN1		Boma	Matadi	135	135	0	Paved		66	63	6	401	458	
RN1		Matadi	Kinshasa	368	368	0	Paved	197	171			825	584	735
RN1		Kinshasa	Kikwit	516	516	0	Paved	217		152	147	160	430	42
RN1		Kikwit	Batshamba	93	93	0	Paved		68	20	5	110	242	
RN1		Batshamba	Riviere Loange	125	0	125	Unpaved			125		15		
RN1		Riviere Loange	Tshikapa	164	0	164	Unpaved				164	37		
RN1		Tshikapa	Kananga	254	0	254	Unpaved		23		231	60	25	
RN1		Kananga	Mbuji Mayi	183	0	183	Unpaved				183	70	53	
RN1		Mbuji Mayi	Mwene Ditu	135	135	0	Paved		75	30	30	286	515	
RN1		Mwene Ditu	Nguba	767	0	767	Unpaved		217	104	446	75	20	
RN1		Nguba	Likasi	62	0	62	Unpaved		12	20	30	180		
RN1		Likasi	Lubumbashi	125	0	125	Unpaved		60	25	40	578	478	
RN1		Lubumbashi	Kasumbalesa	90	0	90	Unpaved		65	25		186	165	
RN1		Kasumbalesa	Sakania BP (Zambia)	127	0	127	Unpaved		90	10	27	150		
RN11		Moanda	Yema BP (Angola)	22	0	22	Unpaved		15	7	0	20		
RN12		Kimbangu	Tshela	98	98	0	Paved		75	23		353		
RN14		Matadi	Ango Ango BP (Angola)	6	6	0	Paved		6			52		
RN15		Songolo	Lovo BP (Angola)	22	0	22	Unpaved			15	7	18		
RN115		BIF.RN1	Kimpangu BP (Angola)	108	0	108	Unpaved		58	47	3	18		
RN16		Inkisi	Kindopolo BP (Angola)	295	0	295	Unpaved		30	95	170	52		
RP230		BIF.RN1(Batshamba)	Kahemba	318	0	318	Unpaved		17	102	199	8		
RP231		Kahemba	BP (Angola)	89	0	89	Unpaved			32	57	50		
RP706		Tshikapa	Shashindo BP (Angola)	174	0	174	Unpaved				174	7		

DRC Route No.	SADC Route No.	Origin	Destination	Length (km)	Paved (km)	Unpaved (km)	Road Surface Type (Paved/Unpaved)	Road Condition				AADT		
								Very Good	Good	Fair	Poor	1986	2002	2004
RN39		Nguba	Kolwezi	122	0	122	Unpaved			80	42	185	44	
RN39		Kolwesi	Dilolo BP (Angola)	426	0	426	Unpaved			100	326	15		
RN5		Kapanga	Dilolo Gare	350	0	350	Unpaved			50	300	14		
RN5		Lubumbashi	Kipushi BP (Zambia)	30	30	0	Paved	30				360		
RN5		Bukavu	Kamanyola	55	0	55	Unpaved			50	5	30		
RN5		Kamanyola	Uvira	83	83	0	Paved		60	23		250		
RN5		Uvira	Bendera	306	0	306	Unpaved			100	206	18		
RN5		Bendera	Kalemie	369	0	369	Unpaved			100	269	12		
RN5		Kalemie	Pweto	413	0	413	Unpaved			76	337	50		
RN5		Pweto	Kasomeno	336	0	336	Unpaved			40	296	20		
RN5		Kasomeno	Lubumbashi	137	0	137	Unpaved			30	107	25		
RN35		Kasomeno	Kasenga BP (Zambia)	66	0	66	Unpaved		15	16	35	20		
RN2		Bukavu	Mwenga	137	0	137	Unpaved			55	82	60		
RN2		Mwenga	Kalole	234	0	234	Unpaved			59	175	35		
RN2		Kalole	Kasongo	152	0	152	Unpaved			50	102	41		
RN2		Kasongo	Lubao	165	0	165	Unpaved			65	100	50		
RN2		Lubao	Kabinda	200	0	200	Unpaved			10	190	21		
RN2		Kabinda	Mbuji Mayi	168	0	168	Unpaved			27	141	25		
RN31		Kindu	Kasongo	230	0	230	Unpaved			30	200	24		
				8370	1473	6897								

3.4.3.2 Financing Needs

Based on the typical levels of routine and periodic maintenance costs on the RTRN, the total annual funding requirements are shown in Table 3.4.3.

Table 3.4.3: DRC Total Annual Funding Requirements (US\$)

Activity	Road Type		Total
	Paved	Unpaved	
Routine	2,798,700	10,131,150	12,929,850
Periodic	4,695,188	23,057,100	27,752,288
TOTAL	7,493,888	33,188,250	40,682,138

3.4.4 Road Network Usage

Tables 2.3.5 and 2.3.6 present the use of the road network made by the five vehicle classes used in the RUC system. The 1986 traffic figures were used, as more recent figures are not complete, and no reasonable growth rates could be arrived at. It should also be noted that the country was for a long period in domestic unrest which could explain the decrease in traffic on some roads since 1986.

Table 3.4.4: DRC Road Network Usage Per Vehicle Type (VKT Million)

Road Type	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	182.89	4.06	6.10	6.10	4.06	203.21
Unpaved	123.15	2.74	4.10	4.10	2.74	136.83
TOTAL	306.04	6.80	10.20	10.20	6.80	340.04

Table 3.4.5: DRC Road Network Usage per Vehicle Type (E80 Million)

Road Type	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	5.65	8.53	17.01	17.03	48.22
Unpaved	0.00	3.80	5.75	11.45	11.47	32.47
TOTAL	0.00	9.45	14.28	28.46	28.50	80.69

2.3.3 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network and the current charges, Table 3.4.6 shows the cost responsibility and cost recovery in US cent per

km. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery in US cents per km for fuel levies included and excluded, respectively.

It will be noted that for all vehicle classes (except for light vehicles when the fuel levy is included), the cost responsibility levels are significantly higher than the cost recovery levels. This can be attributed to the extensive road network and the low traffic levels resulting in high cost responsibility levels.

Table 3.4.6: DRC Total Cost Responsibility, Cost Recovery and Cost Over-(Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	6.21	6.85	3.04	0.64	(3.17)
BUS	30.13	14.24	2.84	(15.89)	(27.29)
2-3 HV	55.28	16.61	6.06	(38.67)	(49.21)
4-5 HV	75.80	20.88	6.06	(54.91)	(69.73)
6 & 6+ HV	91.96	24.02	6.06	(67.94)	(85.90)
Weighted Average	11.96	8.05	3.28	(3.91)	(8.68)

3.4.5 Summary

Years of civil unrest, impacted on the condition of the road network and the traffic levels. There is also a lack of recent traffic counts.

About 82% of the RTRN of the DR Congo is unpaved, and the annual requirement for the financing of routine and periodic maintenance on the RTRN amounts to about US\$ 40.7 million.

The DR Congo has the highest number of charges levied from road users at the border posts.

3.5 Lesotho

There are currently four organisations in Lesotho responsible for the road network, namely the Roads Branch (RB) and the Department of Rural Roads (DoRR) in the Ministry of Public Works and Transport (MoPWT), Maseru City Council (MCC) and the Ministry of Local Government (MoLG). The total road network is estimated at about 7 900km, of which 1 230km is paved.

3.5.1 Institutional Reform Status

Institutional reform in Lesotho commenced in 1996, when the Government of Lesotho created and established a Road Fund in terms of Legal Notice No 16 of 1996. The Road Fund however only became operational in January 1998.

The purpose of the Road Fund is to finance both routine and periodic road maintenance of all roads in Lesotho. These include roads under the jurisdiction of the Roads Branch (RB), the Department of Rural Roads (DoRR), the Maseru City Council (MCC) and the Ministry of Local Government (MoLG).

The Road Fund reports to the Ministry of Finance and is managed by the Road Fund Board which is a policy-making body with representation from both the Government and the private sector.

3.5.2 Current Charges levied from Road Users

The following road user charges are currently levied by the Road Fund:

- Road tollgate fees;
- Cross-border fees;
- Vehicle license fees;
- Vehicle registration fees;
- Short-term permits and special permits;
- Road maintenance levy on fuel;
- Overloading fines;
- Other traffic offences;
- Any other sums to the Road Fund (including donor funds).

The respective road user charges are discussed below in more detail:

3.5.2.1 Road Tollgate Fees

Road tollgate fees are currently being charged for both local and foreign vehicles. No differentiation is made between fees for local and foreign vehicles. The following table indicate the road tollgate fees for both local and foreign vehicles, for the period 2006/2007.

Table 3.5.1: Lesotho Road Tollgate Fees for the Period 2006/2007

VEHICLE TYPE	ROAD TOLLGATE FEES (LOCAL & FOREIGN VEHICLES) (M)
Light Vehicles	5.00
Bus	15.00
Medium Vehicle	15.00
Heavy Vehicle	25.00

Source: Lesotho Road Fund, April 2006.

3.5.2.2 Cross-Border Fees

Although the legal basis for charging cross-border fees has been established, this collection mechanism is not currently in use.

3.5.2.3 Vehicle Registration Fees

Vehicle registration fees for new vehicles are collected by the Department of Traffic and Transport. In terms of the Lesotho Government Gazette dated 9 February 2006, the following vehicle registration fees are currently charged and collected by the Department of Traffic and Transport.

Table 3.5.2: Lesotho Vehicle Registration Fees* for the Period 2006/2007

Motor Vehicle Registration Category	Fees (Maloti)
1(a). Motorcycle solo with engine of cylinder capacity not exceeding 350 cc	30.00
1(b). Motor cycle solo with engine of cylinder capacity not exceeding 350 cc	50.00
2. Motorcycle with side car or similar attachment	60.00
3. Any other motor vehicle	
(a) If the tare weight does not exceed 1,500 kg	80.00
(b) If the tare weight exceeds 1,500 kg but does not exceed 3,500 kg	130.00
(c) If the tare weight exceeds 3,500 kg but does not exceed 6,500 kg	190.00

Motor Vehicle Registration Category	Fees (Maloti)
(d) If the tare weight exceeds 6,500 kg but does not exceed 9,500 kg	210.00
(e) If the tare weight exceeds 9,500 kg but does not exceed 11,000 kg	260.00
(f) If the tare weight exceeds 11,000 kg	300.00
4. Trailer other than trailer referred to in Part II Item 3(a)**	20.00

Source: Lesotho Road Fund, April 2006.

Note: * Vehicle registration fees are charged by the Road Fund but collected by the Department of Traffic and Transport.

**Trailer used exclusively for farming (i) if tare weight does not exceed 500 kg, or (ii) if tare weight exceeds 500 kg.

3.5.2.4 Vehicle License Fees

In terms of the Lesotho Government Gazette dated 9 February 2006, the following vehicle license fees are currently charged and collected by the Road Fund:

Table 3.5.3: Lesotho Vehicle License Fees for the Period 2006/2007

Motor vehicle license category	Fees (Maloti)
1(a). Motorcycle solo with engine capacity not exceeding 350 cc	30.00
1(b). Motor cycle solo with engine capacity not exceeding 350 cc	40.00
2. Motorcycle with side car or similar attachment	50.00
3(a). Trailer used exclusively for farming:	
(i) If tare weight does not exceed 500 kg	25.00
(ii) If tare weight exceeds 500 kg	35.00
3(b). Tractor or truck used exclusively for farming	25.00
4. Motor dealer's licenses	
(a) Motorcycle for the first cycle	90.00
(b) For every additional motorcycle	40.00
(c) Other motor vehicles for the first vehicle	300.00
(d) For every additional vehicle other than a motor cycle	100.00

Source: Lesotho Road Fund, April 2006.

3.5.2.5 Permits and Special Permits

Permits in general are issued for the following categories:

- A Permit, issued to Light Delivery Vehicles (LDVs) and trucks for business purposes;
- B Permit, issued to Light Delivery Vehicles (LDVs) and trucks for private purposes;
- C Permit, issued to taxis and busses for local passenger and public transport;

- D Permit, issued to metered taxis for local passenger and public transport;
- E and F Permits, issued for vehicles of varying load carrying capacity as well as for vehicles of varying passenger carrying capacity;
- Short-term permits;
- Special permits.

Permit categories currently used to charge and collect revenue by the Road Fund are the following:

- Short-term permits,
- Special permits.

3.5.2.6 Short-Term Permits

Category A Permits can be issued as an annual or short-term permit. The Road Fund charges and collects revenue only pertaining to short-term category A Permits. The fee for the application of an initial grant of an A permit is M25.00.

The following table indicate the fees of issue and renewal for the short-term category A Permit of vehicle carrying capacity of up to and including the following tare weights:

Table 3.5.4: Issue & Renewal Fees for Short Term Category A Permit

TAREWEIGHT (KG)	SHORT TERM PERIOD (DAYS) & Fees (Maloti)		
	1	30	90
1,700-4,000	25.00	60.00	90.00
4,001-7,200	30.00	70.00	120.00
7,201-9,300	40.00	90.00	150.00
9,301-9,500	60.00	120.00	180.00
9,501-10,000	100.00	170.00	220.00
More than 10,000	130.00	240.00	280.00

Source: Lesotho Department of Traffic and Transport, April 2006

3.5.2.7 Special Permits

Special permits are issued for vehicles that are in line for vehicle registration. The following table indicate the fees of the respective special permits that are issued:

Table 3.5.5: Special Permit Fees

PERIOD (DAYS)	FEES (Maloti)
7 Days	20.00
21 Days	60.00

Source: Lesotho Department of Traffic and Transport, April 2006

3.5.2.8 Road Maintenance Levy on Fuel

The largest source of revenue for the Lesotho Road Fund is the road maintenance levy. This levy is included in the price of fuel, in particular petrol and diesel. During the month of June 2006, 3.50 per cent and 5.02 per cent increases in the prices of petrol and diesel were announced. The main reason for the increases was the review of the road maintenance levy, which was doubled from 15 lisente per litre to 30 lisente per litre for petrol, and from 20 lisente per litre to 40 lisente per litre for diesel. This is the first adjustment since 1998, when the levy was introduced in Lesotho.

3.5.2.9 Overloading Fines

The fee currently charged and collected per overloaded vehicle is M180.00. No distinction is made between different overloading weights and therefore all overloaded vehicles pay the same fine, no matter the weight with which the vehicle is overloaded.

3.5.2.10 Other Traffic Offences

The fees for any other traffic offences are M180.00, regardless the type of offence.

3.5.2.11 Any Other Sums to the Road Fund

This includes funds such as donor contributions.

3.5.3 RTRN and Financing Needs

3.5.3.1 Extent of the RTRN

A map showing the RTRN in Lesotho is presented in Figure 3.5.1, and the Lesotho RTRN consists of the road sections as indicated in Table 3.5.6.

Table 3.5.6: Lesotho RTRN

Road Section Number	RTRN Section Number	Origin	Destination	Surface Type	Length (km)	AADT	% LV	% BUS	%2-3 HV	% 4-5 HV	% 6 & 6+ HV
A1	SADC 521	Maseru	Mokhotlong	Paved	294.34	1824	68.0	28.0	3.0	0.5	0.5
A2	SADC 522	Maseru	Quthing	Paved	175.83	2096	66.0	27.0	5.0	1.0	1.0
A4	SADC 522	Quthing	Near Mpiti	Paved	155.92	452	62.0	19.0	7.0	6.0	6.0
				Unpaved	15	197	62.0	19.0	7.0	6.0	6.0
A41	SADC 522	Mpiti	Qacha's Nek BP	Paved	13	394	65.0	22.0	6.0	3.5	3.5
B45	SADC 522	Near Mpiti	Sehlabathebe	Unpaved	73	139	81.0	1.0	1.0	8.5	8.5
B46	SADC 423	Sehlabathebe	D 4601	Unpaved	33	49	58.0	5.0	1.0	18.0	18.0
A3	SADC 50/521	Mazenod	Near Mokhotlong	Paved	72	722	55.0	36.0	6.0	1.5	1.5
A3				Unpaved	194	117	55.0	36.0	6.0	1.5	1.5
A31	None	Near Mokhotlong	Sani pass	Unpaved	44	88	52.0	20.0	4.0	12.0	12.0
A10	SADC 50	Maseru	Maseru BP	Paved	5	11500	71.0	27.0	1.0	0.5	0.5
Total					1075.09	1053	63.4	25.4	4.6	3.3	3.3

3.5.3.2 Financing Needs

Based on typical routine and periodic maintenance costs, the total annual funding requirements are shown in Table 3.5.7.

Table 3.5.7: Lesotho Total Annual Funding Requirements (US\$)

Activity	Road Type		Total
	Paved	Unpaved	
Routine	613,791	384,643	998,434
Periodic	2,192,112	879,184	3,071,296
TOTAL	2,805,904	1,263,827	4,069,730

3.5.4 Road Network Usage

The usage of the road network in terms of vehicle kilometres travelled (VKT) and equivalent axle kilometres (E80-km) are shown in Table 3.5.8 and Table 3.5.9, respectively.

Table 3.5.8: Lesotho Annual vehicle kms travelled by Vehicle Class (VKT million)

Road Type	Annual vehicle kilometres travelled (VKT) by Vehicle Class (VKT Million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	264.20	109.00	15.87	4.32	4.32	397.71
Unpaved	9.12	3.53	0.67	0.78	0.78	14.88
TOTAL	273.32	112.52	16.54	5.10	5.10	412.59

Table 3.5.9: Lesotho Annual E80kms travelled by Vehicle Class (E80-km million)

Road Type	Annual E80kms travelled by Vehicle Class (E80-km million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	151.50	22.21	12.06	18.12	203.90
Unpaved	0.00	4.90	0.94	2.17	3.27	11.28
TOTAL	0.00	156.41	23.15	14.24	21.38	215.18

3.5.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network as well as the current charges payable by vehicles, Table 3.5.10 shows the cost responsibility and cost recovery levels in US cent per km. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery in US cents per km for fuel levies included and excluded, respectively.

It will be noted that there is a considerable difference between the cost over or under recovery levels when the fuel levy is included and excluded. When the fuel levy is included, over-recovery occurs in the case of light vehicles and buses as well as in total. However, when the fuel levy is excluded, under-recovery occurs for all vehicle classes. This can be attributed to the fact that revenue from the fuel levy is by far the most significant source of revenue for the Road Fund in Lesotho.

Table 3.5.10: Lesotho Total Cost Responsibility, Cost Recovery and Cost Over-(Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.32	0.61	0.08	0.29	(0.25)
BUS	1.90	2.81	0.23	0.90	(1.68)
2-3 HV	3.11	2.61	0.22	(0.50)	(2.89)
4-5 HV	4.59	3.73	0.37	(0.86)	(4.21)
6 & 6+ HV	5.86	4.44	0.37	(1.42)	(5.49)
Weighted Average	0.99	1.37	0.13	0.39	(0.86)

3.5.6 Summary

The RTRN in Lesotho consists of about 1075 km of which slightly more than 30% is unpaved. The traffic levels on the RTRN are fairly high at about 1050 vehicles per day. The annual funding requirement for routine and periodic maintenance on the RTRN amounts to about US\$ 4 million.

3.6 Malawi

The length of the total road network of Malawi currently covers a distance of approximately 15 500km of which 3 774km are paved. The National Roads Authority (NRA) is responsible for about 70% of the network whilst the remainder is the responsibility of District and Urban Authorities.

3.6.1 Institutional Reform Status

To improve management and financing of the road sector, an Act of Parliament has been passed in 1997 creating the National Roads Authority (NRA), which is mandated to manage the road sector on behalf of Government with resources generated from a Roads Fund, for which the NRA Board has full responsibility.

The legislation establishing the NRA, managed by a private sector dominated Board, and a RF was passed in April 1997. The Act confers on NRA the status of a road authority (with direct jurisdiction over central government roads) concurrently with the local authorities (who have direct jurisdiction over district and local government roads in their areas) and responsibility for the management of the RF to meet the maintenance needs of the entire road network including paths and trails.

The NRA Board created under the Act was appointed in July 1997 with the direct responsibility to recommend raising road user charges for the RF and to determine allocation mechanisms for priority maintenance needs on the road network. The NRA only though became operational on July 1, 1998 in that this was the start of the first (fiscal) year for which it had responsibility for managing a maintenance program. Management responsibility for the RF was vested in February 1998. The specific functions of the Board are to:

- (a) manage and direct the utilization of the Roads Fund;
- (b) monitor the maintenance and development of the public road network of Malawi.
- (c) raise the required funds for adequate maintenance and rehabilitation of public roads;
- (d) prioritize annual road program submitted to the authority by the various central and local road agencies;
- (e) advise the Minister (i.e. at the time the Act was passed – of Works and Supplies) and, where appropriate, the Minister responsible for Local

Government and the Minister responsible for Transport on: (i) preparation of efficient and effective implementation of the annual roads program as specified; and (ii) control of overloading of vehicles on public roads.

Section 18 of the NRA Act, 1997 refers to the establishment of a Roads Fund which shall consist of:

- a. such road user charges as the Minister may, from time to time, on the recommendation of the Board and in consultation with the Minister responsible for finance, determine by order published in the Gazette;
- b. such sums as shall be appropriated by Parliament for the purposes of the Fund;
- c. such sums or assets as may accrue to or vest in the Fund, whether in the course of the exercise by the Board of its functions or powers or otherwise;
- d. such sums or assets as may accrue to or vest in the Fund by way of grants, subsidies, bequests, donations, gifts and subscriptions, from the Government or any other person;
- e. such sums as are derived from the sale of any property, real or personal, by or on behalf of the Authority;
- f. such sums as are received by the Fund by way of voluntary contributions,
- g. penalties payable under this Act; and
- h. such sums or assets as may be donated to the Fund by any foreign government, international agency or other external body of persons, corporate or unincorporated.

As per Section 19 of the NRA Act, 1997 the purpose of the Roads Fund shall be to finance:

- a. the administrative expenses associated with the execution of the duties and responsibilities of the Authority and the management of the Fund;
- b. routine and periodic maintenance of public roads;
- c. on a cost sharing basis, routine and periodic maintenance of , roads, tracks and trails under the responsibility of such roads committees as may

- be established by a city, town, municipal or district council, as the case may be, for the purposes of this Act;
- d. any monetary (Contribution required to be made by the Government for the implementation and execution of a donor-funded project for the maintenance, rehabilitation or development of any public road;
 - e. such road safety programmes as the Board, in consultation with the National Road Safety Council of Malawi, may determine;
 - f. the human and technological resources required for enforcing limits on weights and dimensions of vehicles; and
 - g. research related to the maintenance, rehabilitation and development of roads.

Furthermore, Section 19(2) specifies that “any surplus from the Fund, not exceeding ten percent of the total revenue collected or estimated to be collected in any financial year, may be utilized to finance such minor road works, including upgrading of existing public roads, tracks and trails, as the Board may, on the recommendation of road agencies, approve.”

The Roads Fund is currently under the Treasury Division in the Finance Department of the NRA. This division carries out most of the responsibilities of a conventional Roads Fund except that it does not have the powers to scrutinise the plans or programmes and executed works of the implementing authorities. It also has a set of bank accounts for managing the revenue collected from road user charges.

The NRA Act, 1997 (Act No 13 of 1997) is currently in the process of being reviewed, with the purpose of drafting legislation to separate the Roads Fund functions from the NRA functions. This led to the drafting of two separate bills, the Road Fund Administration Bill of 2005 and the Roads Authority Bill of 2005.

These two bills have not yet been passed by parliament.

3.6.2 Current Charges levied from Road Users

The present sources of revenue of the Roads Fund are as follows:

- Fuel (road) levy;
- Transit Charges; and

- Overloading Fines.

Other charges levied from road users which do not accrue to the Road Fund are License Fees.

These charges are discussed below.

3.6.2.1 Fuel (road) levy

The levels of the fuel (road) levy are MK 8.70 (US cent 6.47) and MK 6.70 (US cent 4.98) for petrol and diesel, respectively.

3.6.2.2 Transit Charges

Transit charges are charged from foreign heavy vehicles (i.e. light foreign vehicles do not pay any international transit charges).

The levels of international transit charges are indicated in Table 3.6.1.

Table 3.6.1: Level of International Transit Charges in Malawi

Vehicle class	International transit charge level* (US\$/100km)
Multiple Axles	15.00
Up to Three Axles	8.00
Buses	6.00

Note: * In terms of COMESA (Common Market for Eastern and Southern Africa), of which Malawi is a member country.

3.6.2.3 Overloading Fines

Vehicle overloading fines are to be paid for vehicles which exceed the maximum total weight limit in terms of GVM (varying between 18 tons and 56 tons which are the maximum permissible weights of a two-axle truck and a truck with a drawbar trailer with a total of 6 axles, respectively), where the steering axle exceeds 8 tons or where one of the other axles exceeds 10 tons. The purpose of the fine is to limit the damage caused to the roads by overloaded vehicles.

Overloading fines as well as international transit fees are calculated on the basis of axle configuration.

3.6.2.4 License Fees

As mentioned earlier, revenue from license fees on motor vehicles does currently not accrue to the Road Fund.

The current formula for calculation of the levels of the licence fees is as follows:

- The annual license fee payable by all vehicles except passenger vehicles (i.e. including saloons and goods vehicles but excluding passenger vehicles) is calculated by multiplying the Gross Vehicle Mass (GVM)¹ in kilograms of each vehicle with a factor of 2 to obtain the annual MK amount payable;
- The annual license fee payable by all passenger vehicles (i.e. for minibuses and buses) is calculated by multiplying the GVM in kilograms of each vehicle with a factor of 80, and dividing the product by a factor of 50 to obtain the annual MK amount payable.

Farm tractors pay a fixed license fee (i.e. regardless of the GVM) of MK100 per year. Construction vehicles are mostly exempted from paying license fees, as they are only allowed to make restrictive use of the road network.

Typical license fee levels are indicated in Table 3.6.2.

Table 3.6.2: Typical License fee levels in Malawi

VEHICLE CLASS	Average GVM (tons)*	Factor for Licence Fee Calculation**	Licence Fee (MK)	Licence Fee (US\$)
Light Vehicles	1.5	2.0	3,000.00	27.27
Light Goods Vehicles	2.4	2.0	4,800.00	43.64
Buses	8.5	1.6	13,600.00	123.64
Heavy Vehicle	25	2.0	50,000.00	454.55

¹ Malawi is one of the few SADC countries where license fee levels are based on GVM and not on tare or unladen weight of the vehicle. License fee levels based on GVM are more equitable than those based on tare.

3.6.3 RTRN and Financing Needs

3.6.3.1 Extent of the RTRN

A map showing the RTRN in Malawi is presented in Figure 3.6.1. The RTRN characteristics are shown in Table 3.6.3.

Table 3.6.3: Malawi RTRN

RTRN Number	Road Number	Origin	Destination	Surface	Length (km)	AADT	% Vehicle Split				
							LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV
SADC 25	M001	Songwe (Border Tanzania)	Mwanza (Border Mozambique)	Paved	918	1568	75.47	4.06	19.39	0.54	0.54
SADC 29	M003	Balaka	Mulanje (Border Mozambique)	Paved	255	1040	75.47	4.06	19.39	0.54	0.54
SADC 20	M012	Lilongwe	Chipata (Border Zambia)	Paved	123	1223	75.47	4.06	19.39	0.54	0.54
SADC 19	M026	Karonga	Chitipa (Border Zambia)	Unpaved	104	89	75.47	4.06	19.39	0.54	0.54
TOTAL					1400	1332	75.47	4.06	19.39	0.54	0.54

Note: This table presents weighted average figures for every SADC RTRN route in Malawi. The source information consisted of 1 km sections and were summarised.

3.6.3.2 Financing Needs

Based on typical unit costs for routine and periodic maintenance, the total annual funding requirements in US\$ are indicated in Table 3.6.4.

Table 3.6.4: Total Annual Funding Requirements (US\$) per Surface Type

Activity	Type		Total
	Paved	Unpaved	
Routine	2,174,752	101,419	2,276,171
Periodic	7,776,000	329,333	8,105,333
TOTAL	9,950,752	430,752	10,381,504

3.6.4 Road Network Usage

The usage of the road network in terms of vehicle kilometers traveled and equivalent standard axle kilometres is shown in Table 3.6.5 and Table 3.6.6, respectively.

Table 3.6.5: Malawi Road Network Usage Per Vehicle Type (VKT Million)

Road Type	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	510.88	27.44	131.03	3.78	3.78	676.92
Unpaved	2.54	0.15	0.65	0.04	0.04	3.42
TOTAL	513.43	27.59	131.68	3.82	3.82	680.34

Table 3.6.6: Road Network Usage per Vehicle Type (E80 Million)

Road Type	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	38.14	183.44	10.56	15.86	248.00
Unpaved	0.00	0.21	0.90	0.11	0.16	1.38
TOTAL	0.00	38.35	184.35	10.66	16.02	249.38

3.6.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network as well on the current charges payable by vehicles, Table 3.6.7 shows the cost responsibility and cost recovery from vehicles in US cents per km. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery in US cents per km for fuel levies included and excluded, respectively. It will be noted that the cost recovery exceeds the cost responsibility for each vehicle class in case where the fuel levy is included. In the case where the fuel levy is excluded, under-recovery only occurs for light vehicles.

Table 3.6.7: Malawi Total Cost Responsibility, Cost Recovery and Cost Over- (Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.47	0.71	-	0.24	(0.47)
BUS	3.57	7.99	6.00	4.43	2.43
2-3 HV	4.75	9.84	8.00	5.10	3.25
4-5 HV	8.11	17.59	15.00	9.48	6.89
6 & 6+ HV	11.32	18.14	15.00	6.82	3.68
Weighted Average	1.53	2.97	1.96	1.44	0.43

3.6.6 Summary

The RTRN in Malawi consists of 1400km of which more than 90% is paved. Traffic levels are fairly high at about 1300 vehicles per day. The annual requirement for the financing of routine and periodic maintenance amounts to about US\$ 10.4 million.

3.7 Mozambique

According to the most recent road classification, the national and regional road network in Mozambique consists of a total of 29,348 km. In addition, the thirty four municipalities have responsibility for approximately 1,800 km of road in the urban road networks.

The national and regional network of roads consists of four classes of road - primary and secondary roads, making up the national road network, and tertiary and vicinal making up the regional road network. The urban road networks are not classified at present.

3.7.1 Institutional Reform Status

Significant changes to the organisation of Mozambique's Roads Sector have taken place as a result of Decrees 2003/20 to 23 which were introduced in 1999. The main changes have included the separation of the financial and implementation functions of the Road Fund and the National Roads Agency that were previously combined.

Currently, the Minister of Public Works and Housing (MOPH) directs the road administration system which is made of the following government institutions:

- Ministry of Public Works and Housing (MOPH);
- Inter-Ministerial Roads Committee;
- National Roads Administration (ANE);
- The Road Fund (FE);
- Provincial Governments, including Provincial Directorate of Public Works & Housing (DPOPHs);
- Provincial Road Commissions;
- Local Authorities;
- Road Associations.

Institutional reform in the roads sector has been under constant review since Mozambique's independence in 1975. ANE was created in 1999, from its predecessor DNEP. In 2003 the organisation was reorganised to run along more commercial lines. Up to November 2005, the management of the Regional Road Network and the routine maintenance of National Roads were the responsibility of the DPOPHs within each Provincial Government. In these arrangements, the DPOPH's reported both to the provincial Governor and the Minister of Public Works and Housing, whilst ANE is managed by a Road Board that also reports to the

Minister. Moreover, ANE had responsibility for the entire road network, but its involvement in those activities that are the direct responsibility of the province was limited to national coordination, definition of procedures, advising the DPOPH's and monitoring their performance.

The latest revision of the institutional arrangements (ref. Presidential Decree No. 8/95 of 26 December, 2005) has resulted in the closing down of the Departments of Roads and Bridges in all the Provincial Directorates of Public Works and Housing and the responsibility for the management of all classified roads being passed to ANE, thereby joining together the Departments of Roads and Bridges and ANE's provincial delegations. The organisation of the National Road Administration System as defined by the current decrees is shown in Figure 3.7.1.

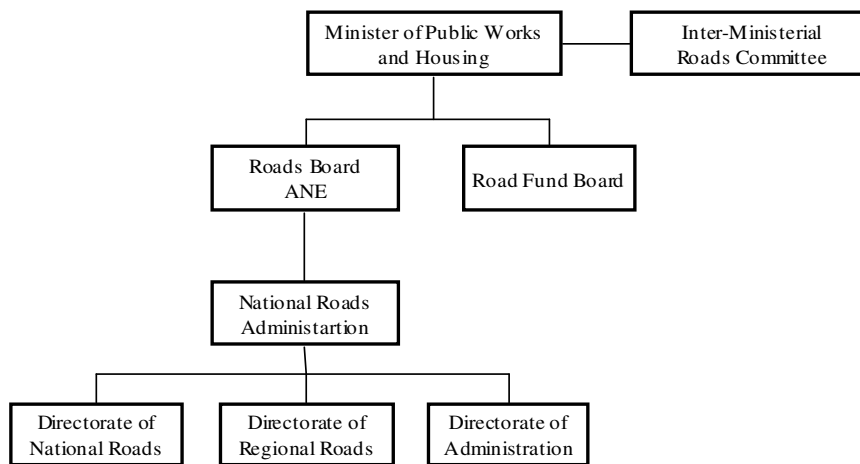


Figure 3.7.1: Mozambique Public Roads Organisation

Further institutional reforms are underway to transform ANE into a results-oriented entity with a proposed structure of four directorates reporting to the Director General, namely the Directorate of Planning, the Directorate of Projects, the Directorate of maintenance and the Directorate of Finance and Administration. The proposed structure will incorporate the provincial road administration divisions to report to the Director General.

3.7.2 Current Charges Levied from Road Users

Decree 14/99 adopts the general principle that road maintenance must be financed by road users through specific taxes collected by ANE in proportion to the use and “consumption” of roads. In practice, the following road user charges are currently levied by the Road Fund

- Fuel (petrol and diesel) charges
- Transit charges
- Bridge tolls

The above charges account for about 84%, 15% and 1% of the total Road Fund revenue.

3.7.2.1 Fuel Levy

Road fund revenue is derived mainly from the fuel levy. The levy is assessed by a special department in the Ministry of Finance (MoF) . The levy is assessed when fuel is withdrawn from bonded stores and, the surcharge, together with all other taxes and duties, is paid by the oil companies into the MoF account. MoF then transfers the surcharge into the Road Fund account. Under this arrangement, 75% of the diesel levy and 50% of the petrol levy are dedicated to the Road Fund.

The level of the fuel levy paid over to the Road Fund is 12.6 US cent per litre for petrol (11.5% of the pump price) and 10.4 US cent per litre for diesel (10% of the pump price).

3.7.2.2 Transit charges

These charges are the second most important source of income to the Road Fund and are levied on commercial vehicles using the main international corridors from the adjacent land-locked countries to the seaports of Mozambique. The levels of transit charges on foreign commercial vehicles are shown in Table 3.7.1.

Table 3.7.1: Mozambique Level of International Transit Charges

Vehicle class	Cross border charge (US \$ per entry)
LV	-
Bus	-
2-3 HV	100.00
4-5 HV	100.00
6 & 6+ HV	100.00

3.7.2.3 Road and bridge tolls

These were introduced in 1997 on a few of the major bridges and most heavily trafficked road, such as the Maputo corridor between South Africa and Maputo. However, the revenue to date is very small.

Tolls are levied on the N4 from Ressano Garcia to Maputo. The toll plazas and the respective level of tolls are as indicated in Table 3.7.2.

Table 3.7.2: Mozambique Toll Charges

Vehicle Class	Moamba			Maputo		
	MT	MTn*	US\$	MT	MTn*	US\$
Class 1 (light vehicles)	95,000.00	95.00	3.48	17500	17.50	0.64
Class 2 (medium heavy vehicles)	236,000.00	236.00	8.65	58000	58.00	2.13
Class 3 (large heavy vehicles)	471,000.00	471.00	17.26	116000	116.00	4.25
Class 4 (extra large heavy vehicles)	707,000.00	707.00	25.91	174000	174.00	6.38

Note: * The new MTn which will be in effect to replace the current MT.

3.7.2.4 Other charges

Other supplementary sources of road user charges which are not yet tapped include vehicle license fees, weighbridge fees on overloaded vehicles, permit fees for buses and commercial vehicles and weight-distance charges on heavy vehicles.

A Comprehensive Road User Charges Study is to be commissioned early in the second phase of ROADS-3 to explore alternative sources of revenue to reduce the deficit on maintenance funding requirements to acceptable levels.

3.7.3 RTRN and Financing Needs

3.7.3.1 Extent of the RTRN

Mozambique's component of the SADC RTRN consists of nine main routes totalling some 5,693 km of mostly both primary and secondary roads which provide connectivity from Mozambique's east coast ports to the five bordering countries of Swaziland, South Africa, Zambia, Zimbabwe and Malawi.

The location of the RTRN links in Mozambique is shown in Figure 3.7.2. As indicated therein, all of the RTRN routes terminate at the border posts of the five surrounding countries.

According to the most recent data available from ANE, just under 50% the paved component of the RTRN is in very good or good condition whilst for unpaved roads is just over 6%. Table 3.7.3 presents the characteristics of the RTRN including traffic flows and composition.

Table 3.7.3: Mozambique RTRN

SADC Route No.	Moz. Road No.	Road Name	Paved (km)	Unpaved (km)	Total Length (km)	AADT	% Vehicle Split				
							LV	Bus	2-3 HV	4 - 5 HV	6 & 6+ HV
40	N4 (toll)	Maputo - Ressano Garcia (B)	92	-	92	4,500	80.3	3.5	9.1	3.6	3.6
35	N2	Namaacha (B) - Matola	61	-	61	1,768	71.4	8.7	14.6	2.7	2.7
None	N3	Goba (B) - N2	31	-	31	860	71.4	8.7	14.6	2.7	2.7
35	N1	Maputo - Sunate	2,484	-	2,484	1,536	71.4	8.7	14.6	2.7	2.7
35	N10	Nicoadala (N1) - Quelimane	34	-	34	1,952	71.4	8.7	14.6	2.7	2.7
35	N380	Sunate (N1) - Miudumbe (N381)	192	28	220	128	71.4	8.7	14.6	2.7	2.7
35	N381	Miudumbe (N380) - Mueda	-	42	42	50	71.4	8.7	14.6	2.7	2.7
35	N381	Mueda – Ruvuma ferry (B)	-	82	82	45	71.4	8.7	14.6	2.7	2.7
35	R1251	N381 - Negomane (Unity Bridge)-(B)	-	125	125	15	71.4	8.7	14.6	2.7	2.7
33	N221	Chicualacuala (B) - Chokwe (Gujia)	60	-	60	185	79.4	3.4	15.0	1.1	1.1
33	N101	Chokwe – Macia (N1)	111	-	111	637	79.4	3.4	15.0	1.1	1.1
31	N300	Vila Fronteira (B) - Mutarara - Sena	49	45	94	45	82.1	-	17.8	0.1	0.1
31	N283	Sena – Caia	-	198	198	35	82.1	-	17.8	0.1	0.1
30	N6	Manica (B) - Inchope - Beira	284	-	284	2,283	70.9	5.2	6.5	8.8	8.8
29	N11	Milange (B) - Mocuba	-	423	423	80	59.4	3.2	29.0	4.2	4.2
25	N8	Cuchamano (B) - Changara (N7)	49	-	49	783	49.9	3.0	9.8	18.6	18.6
25	N7	Changara – Tete - Zoboue	211	-	211	2,547	49.9	3.0	9.8	18.6	18.6
24	N9	Cassacatiza (B) - Tete	269	-	269	144	53.6	7.2	13.2	13.0	13.0
24	N7	Changara – Nova Vanduzi	270	-	270	468	53.6	7.2	13.2	13.0	13.0
20	N13	Mandimba (B) - Cuamba	-	145	145	145	48.8	7.9	28.1	7.6	7.6
20	N13	Cuamba - Nampula	-	305	305	145	48.8	7.9	28.1	7.6	7.6
20	N12	Namialo (N1)- Nacala	105	-	105	145	48.8	7.9	28.1	7.6	7.6
TOTAL			4,299	1,393	5,693	1,065	68.1	6.5	13.4	6.0	6.0

Source: Based on Road Sector Strategy Study databases of paved and Unpaved Roads (2005) – Stewart Scott International and Seed

3.7.3.2 Financing Needs

Based on typical levels of routine and periodic maintenance costs for paved and unpaved roads of the RTRN, the total annual funding requirements for routine and periodic maintenance are indicated in Table 3.7.4.

Table 3.7.4: Mozambique Total Annual Funding Requirements (US\$)

Activity	Type		Total
	Paved	Unpaved	
Routine	4,613,760	1,822,250	6,436,010
Periodic	29,642,250	8,385,500	38,027,750
TOTALS	34,256,010	10,207,750	44,463,760

3.7.4 Road Network Usage

Table 3.7.5 and Table 3.7.6 present the use of the road network made by the five vehicle classes used in the RUC system.

Table 3.7.5: Mozambique Road Network Usage Per Vehicle Type (VKT Million)

Road Type	LV	BUS	2-3 HV	4+ HV	6 & 6+ HV	Total
Paved	1506.47	158.01	279.21	113.76	113.76	2171.22
Unpaved	24.57	2.63	11.46	2.44	2.44	43.55
TOTAL	1531.05	160.64	290.66	116.21	116.21	2214.77

Table 3.7.6: Mozambique Road Network Usage per Vehicle Type (E80 Million)

Road Type	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	219.63	390.89	317.40	476.67	1404.59
Unpaved	0.00	3.66	16.04	6.82	10.24	36.75
TOTAL	0.00	223.30	406.93	324.22	486.91	1441.35

3.7.5 Cost Responsibility and Recovery Levels

Table 3.7.7 shows the cost responsibility based on the funding requirements and the use of the network as well as the cost recovery from vehicles based on the current charges payable by vehicles. Cost responsibility and cost recovery levels are also compared by presenting the total over - or under-recovery for fuel levies included and excluded, respectively. It will be noted that there is a significant difference between

the cost over- or under-recovery levels if fuel levies are included or excluded. This can be attributed to the fact that the fuel levy in Mozambique forms a substantial part of revenue to the Road Fund.

It will also be noted that in the case where the fuel levy is included, the cost recovery exceeds the cost responsibility for all vehicles except for the 6 and 6+ axle heavy vehicles. Where the fuel levy is excluded, there is cost under-recovery for all vehicle classes.

Table 3.7.7: Mozambique Total Cost Responsibility, Cost Recovery and Cost Over- (Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.44	1.45	0.07	1.01	(0.37)
BUS	3.10	4.33	0.17	1.23	(2.93)
2-3 HV	4.52	5.86	2.01	1.34	(2.51)
4-5 HV	7.21	7.59	2.18	0.38	(5.02)
6 & 6+ HV	9.67	8.82	2.27	(0.85)	(7.40)
Weighted Average	2.01	2.95	0.56	0.94	(1.45)

3.7.6 Summary

The floods in Mozambique had a devastating impact on the road network.

The RTRN in Mozambique consists of about 5700 km of which 25% is unpaved. Average traffic levels on the RTRN are in the region of about 1065 km, and the annual requirements for routine and periodic maintenance on the RTRN amount to about US\$44.5.

3.8 Namibia

The length of the national road network in Namibia, consisting of every proclaimed trunk, main and district road is about 43 000 km of which only 13% is paved. Namibia has possibly one of the most extensive road networks per capita (i.e. length of road network divided by population) in the SADC region.

3.8.1 Institutional Reform Status

After Independence from South Africa in 1990, Namibia opted for reforming its transport and communications sectors. A process was initiated with the purpose of liberalising policies in the transport and communications sectors and restructuring the Ministry of Works, Transport and Communication which is vested in the MWTC2000 project. The MWTC2000 aims at transferring all non-core activities from the Ministry to operational entities, as well as increasing private sector provision through competitive procedures.

The largest of these efforts to date has been the Road Sector Reform. Work on this reform was initiated already in late 1990 in response to recommendations made in a study. The initial work focused on road taxation and road funding in order to secure adequate future funding levels, required to be able to preserve the existing road network.

The responsibility for the management of the national road network in Namibia was transferred on 1 April 2000 to the Roads Authority (RA), enabled legally in terms of the Roads Authority Act 1999 (Act 17 of 1999) with the overall objective of managing the national road network with a view to achieving a safe and efficient road sector. At the same time the Road Fund Administration (RFA) was established by the Road Fund Administration Act 1999 (Act 18 of 1999), with the mandate of managing the road user charging system and the Road Fund and the objective to regulate funding with a view to the achievement of a safe and economically efficient road sector.

As part of the Road Sector Reform, the Roads Contractor Company (RCC) was also established. The RCC was established in terms of the Companies Act, and is fully owned by the Government of Namibia. The Roads Contractor Act (No. 14 of 1999) was promulgated in the Government Gazette of 18 October 1999. The Company was established on 10 March 2000 and commenced operations on 1 April 2000.

The RCC was formed from the road maintenance and construction “arm” of the Department of Transport. Relevant assets, liabilities, rights and obligations were transferred to the RCC in order that the company may be able to carry out its objectives.

3.8.2 Current Charges levied from Road Users

Current charges levied from road users are discussed below.

3.8.2.1 Fuel Levies

In terms of Section 18(1)(d), and subject to sub-section (4)(f) of the RFA Act, 1999 (Act No 18 of 1999), the RFA may impose “... a levy on every litre of petrol and every litre of diesel sold by any undertaking at any point in Namibia and which is to be included in any determination of the selling price of petrol or diesel, as the case may be, under any law relating to petroleum products”.

The purpose of fuel levies is to recover variable costs from road users.

The current level of the fuel levy (indicated in **bold**) as well as the other levies, taxes and margins on fuel is indicated in Table 3.8.1.

Table 3.8.1: Fuel Price Composition – May 2006 (Namibia cents per litre)

	UL Petrol	Leaded Petrol	Diesel
Fixed Pump Price	527.000	525.000	509.000
Basic Fuel Price at Walvis Bay	283.189	279.687	310.094
- Industry/Wholesaler Margin	36.000	36.000	36.000
- Service differential - operational cost	11.540	11.540	11.540
- MVA Levy (MVA & NRSC)	11.000	11.000	11.000
- Fuel Tax destined for State Revenue Fund	12.000	12.000	10.000
- RFA - Road User Charge/Fuel levy	77.000	77.000	77.000
- National Energy Fund (NEF) levy	21.000	21.000	21.000
- Customs & Excise Duty	4.000	4.000	4.000
- Dealers/Retail Margin	39.000	39.000	39.000
Over/under recovery	32.271	33.773	-10.634
<i>Source: Ministry of Mines and Energy</i>			

3.8.2.2 License Fees

The license fee collection system was implemented with the Gazetting of Government Notice Nr 94 dated 1 April 2000. In terms of the system, registering authorities, appointed by the Ministry of Works, Transport and Communication, collect licence fees and pay these into the RFA's bank account.

Revenue from vehicle licence fees are raised in accordance with the principle that fixed fees should preferably be used for the recovery of fixed costs.

The fee levels (as on May 2006) are indicated in Table 3.8.2.

Table 3.8.2: Levels of Vehicle License Fees

Type of vehicle	Tare of vehicle (kg)			Annual Licence Fee (N\$)
		All		
Motorcycles, tricycles and quadrucycles		All		144
Light passenger motor vehicles (less than 12 persons), Light load vehicles (GVM<3500kg) and Special Vehicles	0	-	750	216
	751	-	1000	312
	1001	-	1250	336
	1251	-	1500	360
Heavy Passenger Motor Vehicles (12 or more persons), Heavy Load Vehicles (GVM>3500kg, not equipped to draw) and Heavy Load Vehicles (GVM>3500kg, equipped to draw)	1501	-	2000	456
	2001	-	3000	732
	3001	-	4000	1404
	4001	-	5000	2136
	5001	-	6000	5160
	6001	-	7000	7212
	7001	-	8000	9204
	8001	-	9000	11760
	9001	-	10000	14496
	10001	-	11000	17640
	11001	-	12000	21276
	12001	-	12500	24780
12501	-	13000	26280	
13001	-	13500	27756	
13501	-	14000	29244	
14001	-	14500	30774	
14501	-	15000	32172	
15001	-	15500	33672	
15501	-	16000	35136	

Type of vehicle	Tare of vehicle (kg)			Annual Licence Fee (N\$)
	16001	-	16500	36636
	16501	-	17000	38100
	17001	-	17500	39564
	17501	-	18000	41040
	18001	-	18500	42528
	18501	-	19000	44040
	19001	-	19500	45504
	19501	-	20000	46980
	20001	-	20500	48456
	20501	-	21000	49932
	21001	-	21500	51408
	21501	-	22000	52884
	22001	-	22500	54360
	22501	-	23000	55836
	23001	-	23500	57312
	23501	-	24000	58788
	24001	-	24500	60264
	24501	-	25000	61740
	25001	-	25500	63216
	25501	-	26000	64692
	26000	and	Above	N\$1476 for every 500kg
Trailers and semi-trailers (excl caravans)	0	-	1000	144
	1001	-	2000	360
	2001	-	3000	648
	3001	-	4000	2880
	4001	-	5000	4032
	5001	-	6000	5796
	6001	-	7000	7176
	7001	-	8000	8244
	8001	-	9000	11760
	9001	-	10000	13236
	10001	-	11000	15252
	11001	-	12000	17316
	12001	-	12500	18516
	12501	-	13000	19716
	13001	-	13500	20952

Type of vehicle	Tare of vehicle (kg)			Annual Licence Fee (N\$)
	13501	-	14000	22152
	14001	-	14500	23364
	14501	-	15000	24576
	15001	-	15500	25776
	15501	-	16000	26988
	16001	-	16500	28224
	16501		17000	29412
	17001		17500	30636
	17501		18000	31812
	18001		18500	33036
	18501		19000	34260
	19001		19500	35436
	19501		20000	36672
	20000	and	Above	N\$1176 for every 500kg
Caravans (other than self-propelled caravans)		All		192

3.8.2.3 Mass-Distance Charges System (MDCs)

MDCs were to be implemented on 1 April 2006¹. Section 18(1)(a) of the RFA Act empowers the RFA to levy a charge on any motor vehicle in respect of the travelling distance in the course of on-road use, which may be based on the mass and dimensions of the vehicle. This charge is commonly referred to as mass-distance charges, which are aimed at recovering the excess variable cost responsibility for heavy vehicles that cannot be recovered using fuel levies only.

Mass-distance charges are expressed in terms of a rate/charge per distance and rates increase with the weight of a vehicle. The levying of such charges require the measurement of distances travelled by individual vehicles as well as additional administrative arrangements for their collection.

¹ The implementation of the MDC proved to be a contentious issue, strongly resisted by the organised trucking industry mainly on grounds of alleged inefficiency and inequity, and a court ruling disallowed the implementation of MDCs as they are to be temporarily based on assumed distances instead of actual distances.

3.8.2.4 Cross-Border Charges System (CBCs)

The current Cross-Border Charges (CBC) system was developed during October and November 2000 and implemented at four border posts on 1 December 2000. The CBC System has now been in operation for over 2 years. A further 6 border collection points have in the meantime been set up for collecting cross-border charges.

The current cross-border charge is the road user charge referred to in terms of Section 18(1)(c) of the RFA Act, namely an “entry fee” in respect of a motor vehicle not registered in Namibia that temporarily enters Namibia. The total charge on any foreign vehicle should be such as to have the same net effect as road charges paid by Namibian road users in Namibia, in order to comply with the principle of non-discrimination in terms of Section 18(3)(d) of the RFA Act.

The cross-border charges are collected by an agent on behalf of the RFA and deposited onto the RFA account on a weekly basis.

Currently a flat fee per vehicle type is charged. The ultimate aim is to eventually charge cross-border traffic on the basis of distance travelled and vehicle weight through the implementation of a mass-distance charging system. The aim is that a cross-border charge will eventually consist of both an “entry fee” as well as a “mass-distance charge” or a “distance-related fee”.

The levels (as during May 2006) are indicated in Table 3.8.3.

Table 3.8.3: Cross Border Charges payable by Foreign Motor Vehicles

Type	Description	Entry fee (N\$)
Type 1	Motor cycles, motor tricycle and motor quadrucycle Caravans and light trailers drawn by type 2 vehicles	90.00
Type 2	All passenger cars, station wagons, S/C and D/C	140.00

Type	Description	Entry fee (N\$)
	bakkies, 2x4 and 4x4 bakkies, Kombis, Microbus and Minibus (less than 25 passengers)	
Type 3	Light goods vehicle/delivery vehicles (GVM <3500 kg)	290.00
Type 4	Bus with 2 axles. (carrying capacity of 25 or more Passengers)	350.00
Type 5	Bus : with 3 axles (carrying capacity of 25 or more Passengers)	440.00
Type 6	Single unit Truck with 2 axles	350.00
Type 7	Single unit Truck with 3 axles	440.00
Type 8	Truck tractor : with 2 axles	350.00
Type 9	Truck tractor : with 3 axles	440.00
Type 10	Truck tractor : with 4 or more axles	830.00
Type 11	Trailer : with 1 axle	230.00
Type 12	Trailer : with 2 axles	350.00
Type 13	Trailer : with 3 axles	440.00
Type 14	Trailer : with 4 axles	580.00
Type 15	Trailer : with 5 or more axles	710.00
Type 16	Tyre dozer, grader motor, front-end loaders, excavators, self-propelled vibratory rollers	1200.00
Type 17	Any other vehicle not listed	230.00
	Regular user permit	200.00

Note: the entry fee for a combination of vehicles is calculated by adding the sum of the entry fees for each vehicle in the combination that is subject to the payment of entry fees. The entry fee also includes an amount of N\$45.00 as an administrative fee, as well as 15% VAT.

3.8.3 RTRN and Financing Needs

3.8.3.1 Extent of the RTRN

Namibia's RTRN is shown graphically in Figure 3.8.1, and the characteristics of the RTRN are indicated in Table 3.8.4.



Figure 3.8.1: Namibia RTRN Map

Table 3.8.4: Namibia RTRN

SADC Route No	Road No	Origin	Destination	RTRN Paved Km	RTRN Unpaved Km	RTRN Total km	AVG AADT	% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
SADC 12	M0110	Junction T0111	Rundu	79.98	329.33	409.31	227	89.52%	0.40%	1.85%	5.96%	2.27%
SADC 05	T0101	Noordoewer (RSA)	Grunau	142.05	0.00	142.05	276	73.54%	1.01%	4.68%	15.04%	5.72%
SADC 05/SADC 50	T0102	Grunau	Keetmanshoop	157.62	0.00	157.62	575	64.40%	1.36%	6.30%	20.24%	7.70%
SADC 05	T0103	Keetmanshoop	Mariental	228.71	0.00	228.71	770	76.86%	0.88%	4.10%	13.16%	5.00%
SADC 05	T0104	Mariental	Rehoboth	174.86	0.00	174.86	972	76.96%	0.88%	4.08%	13.10%	4.98%
SADC 05	T0105	Rehoboth	Windhoek	83.67	0.00	83.67	2428	88.19%	0.45%	2.09%	6.72%	2.55%
SADC 05/SADC 40	T0106	Windhoek	Okahandja	73.70	0.00	73.70	4212	89.33%	0.41%	1.89%	6.07%	2.31%
SADC 05	T0107	Okahandja	Otjiwarongo	175.30	0.00	175.30	1424	81.51%	0.71%	3.27%	10.52%	4.00%
SADC 05	T0108	Otjiwarongo	Otavi	117.73	0.00	117.73	1250	80.60%	0.74%	3.43%	11.03%	4.19%
SADC 05	T0109	Otavi	Tsumeb	61.90	0.00	61.90	952	78.78%	0.81%	3.76%	12.06%	4.59%
SADC 05	T0110	Tsumeb	Oshivelo	94.75	0.00	94.75	899	74.07%	0.99%	4.59%	14.75%	5.61%
SADC 05	T0111	Oshivelo	Oshikango (Angola)	214.98	0.00	214.98	1434	82.33%	0.68%	3.13%	10.05%	3.82%
SADC 40	T0201	Walvis Bay	Swakopmund	32.40	0.00	32.40	4038	91.94%	0.31%	1.43%	4.58%	1.74%
SADC 40	T0202	Swakopmund	Karibib	145.32	0.00	145.32	1298	84.66%	0.59%	2.72%	8.72%	3.32%
SADC 32	T0203	Karibib	Omaruru	62.86	0.00	62.86	342	86.72%	0.51%	2.35%	7.55%	2.87%
SADC 32	T0204	Omaruru	Otjiwarongo	132.24	0.00	132.24	341	85.78%	0.54%	2.52%	8.08%	3.07%
SADC 50	T0301	Nakop (RSA)	Grunau	178.08	0.00	178.08	243	64.01%	1.38%	6.37%	20.46%	7.78%
SADC 50	T0401	Keetmanshoop	Aus	211.47	0.00	211.47	214	77.63%	0.86%	3.96%	12.72%	4.84%
SADC 50	T0402	Aus	Luderitz	123.20	0.00	123.20	220	75.00%	0.96%	4.42%	14.22%	5.40%
SADC 302	T0801	Otavi	Grootfontein	90.36	0.00	90.36	563	85.44%	0.56%	2.58%	8.28%	3.15%
SADC 302	T0802	Grootfontein	Mururane	127.41	0.00	127.41	421	78.84%	0.81%	3.75%	12.03%	4.58%
SADC 302	T0803	Mururane	Rundu	130.87	0.00	130.87	452	78.73%	0.81%	3.76%	12.09%	4.60%
SADC 12	T0804	Rundu	Divundu	198.27	0.00	198.27	292	77.38%	0.86%	4.00%	12.86%	4.89%
SADC 12	T0805	Divundu	Kongola	195.81	0.00	195.81	146	76.64%	0.89%	4.13%	13.28%	5.05%
SADC 12	T0806	Kongola	Katima Mulilo	118.38	0.00	118.38	190	82.07%	0.69%	3.17%	10.19%	3.88%
SADC 12	T0807	Katima Mulilo	Ngoma (Botswana)	67.29	0.00	67.29	247	89.76%	0.39%	1.81%	5.82%	2.21%

SADC Route No	Road No	Origin	Destination	RTRN Paved Km	RTRN Unpaved Km	RTRN Total km	AVG AADT	% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
SADC 40	T0701	Karibib	Okahandja	146.04	0.00	146.04	1245	85.40%	0.56%	2.58%	8.30%	3.16%
SADC 40	T0601	Windhoek	Gobabis	199.02	0.00	199.02	1105	87.14%	0.49%	2.28%	7.31%	2.78%
SADC 40	T0602	Gobabis	Buitepos (Botswana)	111.33	0.00	111.33	240	72.81%	1.04%	4.81%	15.46%	5.88%
TOTAL				3,419.21	329.33	3748.54	746	80.89%	0.73%	3.38%	10.87%	4.13%

3.8.3.2 Financing Needs

Based on typical routine and periodic road maintenance costs in Namibia, the total annual financing requirements are shown in Table 3.8.5.

Table 3.8.5: Total Annual Funding Requirements (US\$) per Surface Type

Activity	Type		Total
	Paved	Gravel	
Routine	8,897,419	76,017	8,973,436
Periodic	5,100,872	459,257	5,560,129
TOTAL	13,998,291	535,274	14,533,565

3.8.4 Road Network Usage

The usage of the road network in terms of vehicle kilometres travelled and equivalent axle kilometres is shown in Table 3.8.6 and Table 3.8.7, respectively.

Table 3.8.6: Namibia Road Network Usage per Vehicle Type (VKT Million)

Road Type	Annual vehicle kilometres travelled (VKT) by Vehicle Class (VKT million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	816.07	6.80	31.46	101.08	38.43	993.84
Unpaved	21.16	0.09	0.44	1.41	0.54	23.65
TOTAL	837.23	6.89	31.90	102.50	38.97	1,017.49

Table 3.8.7: Namibia Road Network Usage per Vehicle Type (E80km Million)

Road Type	Annual E80kms travelled by Vehicle Class (E80km million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	9.45	44.05	282.02	161.03	496.55
Unpaved	0.00	0.13	0.62	3.94	2.25	6.94
TOTAL	0.00	9.58	44.67	285.97	163.28	503.49

3.8.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network as well as the the current charges payable by vehicles, Table 3.8.8 shows the cost responsibility and

cost recovery from vehicles in US cents per km. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery in US cents per km for fuel levies included and excluded, respectively. It will be noted that there is a significant difference between the cost over or under recovery levels if the fuel levies are included or excluded. This can be attributed to the fact that the fuel levy in Namibia provides a significant source of revenue.

It will also be noted that if the fuel levy is excluded, the cost recovery exceeds the cost responsibility in the case of light vehicles (LV). For all other vehicle classes, the cost responsibility exceeds the cost recovery.

Table 3.8.8: Namibia Total Cost Responsibility, Cost Recovery and Cost Over-(Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.38	1.81	0.40	1.42	0.01
BUS	2.76	6.26	1.13	3.50	(1.63)
2-3 HV	3.80	5.89	1.14	2.08	(2.66)
4-5 HV	6.34	9.51	2.84	3.16	(3.50)
6 & 6+ HV	8.73	11.65	3.58	2.92	(5.16)
Weighted Average	1.43	3.12	0.80	1.69	(0.63)

Note: The administrative costs of operating the cross-border charge system and value added tax were excluded from the cost recovery levels.

3.8.6 Summary

The RTRN in Namibia consist of about 3 700km of which less than 10% is unpaved. Traffic levels are very low at about 746 vehicles per day, and the annual requirements for financing of routine and periodic maintenance on the RTRN amount to US\$14.5 million.

3.9 South Africa

The South African National Roads Agency Limited (SANRAL) manages the National road network, which forms the core of the economic road network. SANRAL operates through their Head Office in Pretoria and four Regional offices. Quite a number of National road sections are operated on a toll basis, in many cases by a concessionaire for a period of up to 30 years.

Provincial roads are managed by the nine Provincial Roads Departments, at least one of whom has converted to a Roads Agency.

At Local level, roads are managed by various types of local authorities. The Metropolitan Councils are quite large organizations, with the ability to manage extensive, highly developed urban networks. In other cases, Local Municipalities are responsible for roads under their jurisdiction, and lastly District Councils are operational mostly in rural areas.

3.9.1 Institutional Reform Status

South Africa does not have a dedicated Roads Fund but has a National Roads Agency, named South African National Roads Agency Limited (SANRAL).

Prior to the formation of the South African Roads Agency (SANRAL), its responsibilities were in the hands of the South African Roads Board which was an organ of the Department of Transport. The Department of Transport restructured and rationalised its operations, establishing four different agencies, of which the National Roads Agency was set up to be responsible for roads.

Established in 1998 in accordance with the South African National Roads Agency Limited and National Roads Act 1998, SANRAL is an independent, statutory company registered in terms of the Companies Act. The South African government, represented by the Minister of Transport, is the reporting department of the Agency. SANRAL's mandate is to develop, maintain and manage South Africa's national road network.

SANRAL's main functions are as follows:

- To strategically plan, design, construct, operate, rehabilitate and maintain South Africa's national roads.
- To deliver and maintain a primary road network of world-class standards.
- To generate revenues from the development and management of these assets.
- To undertake research and development to enhance the quality of South Africa's roads.
- To advise the Minister of Transport on matters relating to South Africa's roads.
- To plan, design, construct, operate, manage, control, rehabilitate and maintain roads in any foreign country in response to a request by South Africa's Minister of Transport, following appropriate agreements with that country.

SANRAL is directed by a Board of Directors, being experts in various spheres of business and infrastructure development. The Board reports directly to the Minister of Transport via its Chairman.

3.9.2 Current Charges levied from Road Users

Current charges levied from Road Users include toll charges on various routes and annual vehicle licence fees. There is not a dedicated fuel levy in South Africa, but fuel tax is paid into the State Revenue Fund. Funds for the development and maintenance are then disbursed from the SRF to SANRAL and other entities.

3.9.2.1 Toll Charges

The levels of the toll charges are indicated in Table 3.9.1.

Table 3.9.1: Toll Charges payable in South Africa

Road Number	Toll Plaza	Toll Charges per vehicle type in SA Rand			
		Light	2 Axle + Bus	3 and 4 Axle	5 Axles or more
N1	Huguenot	18.00	47.00	73.00	118.00
N1	Verkeerdevelei	27.00	53.00	80.00	107.00
N1	Vaal	31.00	58.00	70.00	93.00

Road Number	Toll Plaza	Toll Charges per vehicle type in SA Rand			
		Light	2 Axle + Bus	3 and 4 Axle	5 Axles or more
N1	Grasmere	9.50	25.00	29.00	38.00
N1	Pumulani	5.60	14.00	16.00	19.50
N1	Carousel	26.00	69.00	77.00	88.00
N1	Kranskop	21.00	53.00	64.00	84.00
N1	Nyl	27.00	51.00	61.00	82.00
N1	Capricorn	22.00	54.00	65.00	87.00
N1	Baobab	21.00	52.00	73.00	94.00
N2	Tongaat	5.50	11.00	14.00	21.00
N2	Mvoti	6.50	16.00	21.00	31.00
N2	Mtunzini	22.00	41.00	49.00	65.00
N3	Mariannahill	5.50	10.00	12.00	19.00
N3	Mooi	23.00	57.00	80.00	109.00
N3	Tugela	33.00	55.00	87.00	120.00
N3	Tugela	21.00	34.00	51.00	71.00
N3	Wilge	31.00	54.00	72.00	102.00
N3	De Hoek	23.00	35.00	54.00	77.00
N4	Pelindaba	3.00	5.00	7.00	9.00
N4	Quagga	2.50	4.00	5.00	7.00
N4	Swartruggens	48.00	120.00	146.00	172.00
N4	Marikana	10.50	24.50	28.00	33.00
N4	Brits	6.80	24.00	26.00	31.00
N4	Doornpoort	6.80	17.00	20.00	24.00
N4	Diamond Hill	18.00	24.00	46.00	75.00
N4	Middelburg	29.00	62.00	95.00	124.00
N4	Machado	43.00	119.00	174.00	248.00
N4	Nkomazi	33.00	66.00	96.00	138.00

3.9.2.2 Vehicle licence fees

Vehicle licence fees vary for the 9 provinces in South Africa. For illustrative purposes, the licence fee levels are shown for 3 provinces in Table 3.9.2.

Table 3.9.2: Vehicle licence fee levels in South Africa

Tare Weight in kg	Licence Fee Level per Province in SA Rand		
	Western Cape	KwaZulu Natal	Gauteng
0-250	243.00	114.00	90.00
251-500	252.00	147.00	108.00
501-750	258.00	177.00	138.00
751-1000	279.00	219.00	156.00
1001-1250	336.00	246.00	186.00
1251-1500	456.00	315.00	240.00
1501-1750	513.00	372.00	288.00
1751-2000	579.00	438.00	336.00
2001-2250	786.00	531.00	420.00
2251-2500	912.00	630.00	492.00
2501-2750	1,032.00	726.00	564.00
2751-3000	1,041.00	825.00	636.00
3001-3250	1,266.00	924.00	732.00
3251-3500	1,425.00	1,053.00	840.00
3501-3750	1,737.00	1,182.00	972.00
3751-4000	1,881.00	1,308.00	1,068.00
4001-4250	2,052.00	1,443.00	1,164.00
4251-4500	2,217.00	1,566.00	1,260.00
4501-4750	2,367.00	1,698.00	1,380.00
4751-5000	2,538.00	1,827.00	1,476.00
5001-5250	3,792.00	2,769.00	2,232.00
5251-5500	4,077.00	3,069.00	2,472.00
5501-5750	4,431.00	3,357.00	2,712.00
5751-6000	4,788.00	3,654.00	2,988.00
6001-6250	5,160.00	3,951.00	3,216.00
6251-6500	5,556.00	4,269.00	3,444.00
6501-6750	5,967.00	4,599.00	3,744.00
6751-7000	6,537.00	4,920.00	4,044.00
7001-7250	6,750.00	5,238.00	4,260.00
7251-7500	7,146.00	5,565.00	4,500.00
7501-8000	7,830.00	6,123.00	4,980.00
8001-8500	8,775.00	6,876.00	5,628.00
8501-9000	9,696.00	7,641.00	6,192.00
9001-9500	10,659.00	8,397.00	6,876.00
9501-10000	11,622.00	9,192.00	7,464.00
10001-10500	12,825.00	10,185.00	8,328.00
10501-11000	14,037.00	11,178.00	9,048.00
11001-11500	15,294.00	12,186.00	9,888.00
11501-12000	16,551.00	13,203.00	10,776.00
12001-12500	18,294.00	14,385.00	11,700.00
12501-13000	20,037.00	15,567.00	12,624.00
13001-13500	21,780.00	16,749.00	13,548.00
13501-14000	23,523.00	17,931.00	14,472.00
14001-14500	25,266.00	19,113.00	15,396.00
14501-15000	27,009.00	20,295.00	16,320.00
For each additional 500kg or part thereof	Plus R1743.00	Plus R1182.00	Plus R924.00

3.9.2.3 Fuel Levies

South Africa does not have a dedicated fuel levy. The fuel price breakdown in South Africa is shown in Table 3.9.3, and it will be noted that the fuel price includes a fuel levy of 116 SA cents on petrol (18.71 US cents) and 100 SA cents on diesel (16.13 US cents) which is paid into the State Revenue Fund.

Table 3.9.3: South Africa Fuel Price Breakdown as on 30 April 2006

ITEM	Petrol	Petrol	Petrol	Diesel	Diesel
	95	93	91	*	*
	ULP	ULP & LRP	ULP	0.05% S	0.005% S
	c/l	c/l	c/l	c/l	c/l
Contribution to the basic price	297.41	295.63	294.85	338.63	342.03
Wholesale margin	39.49	39.27	39.05	39.26	39.26
Service cost recoveries	7.00	7.00	7.00	7.00	7.00
Storage, handling & delivery costs	7.00	7.00	7.00	7.00	7.00
Distribution cost					
Dealers margin (*)	43.90	43.90	43.90		
Zone differential in Gauteng	13.70	13.70	13.70	13.70	13.70
IP Tracer levy				0.01	0.01
Fuel levy	116.00	116.00	116.00	100.00	100.00
Slate levy	5.00	5.00	5.00	5.00	5.00
Subsidy from EQF Levy	0.00	0.00	0.00	0.00	0.00
Customs & excise duty	4.00	4.00	4.00	4.00	4.00
DSML (Inland Revenue)	10.00				
EQF levy	0.00	0.00	0.00	0.00	0.00
RAF levy	36.50	36.50	36.50	36.50	36.50
Sub-total	275.59	265.37	265.15	205.47	205.47
Retail price	573.00	561.00	560.00		
Wholesale price	529.10	517.10	516.10	544.10	547.50

Note: (*) The wholesale price of diesel is regulated, but not the retail price.

3.9.3 RTRN and Financing Needs

3.9.3.1 Extent of the RTRN

The Regional Trunk Route Network of South Africa is shown in Figure 3.9.1. Table 3.9.4 shows the characteristics of the RTRN in South Africa.

Table 3.9.4: South Africa RTRN

SADC Road No	Road No	Origin	Destination	Length km	AVG AADT	% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
SADC 25/16/06	N001	Cape Town	Zimbabwe Border (Beit Bridge)	2,398.39	12,649	79.13%	2.24%	4.07%	8.19%	6.36%
SADC 35/None	N002	Durban	Ermelo	749.52	11,064	85.60%	2.40%	4.03%	4.80%	3.18%
SADC 36	N003	Durban	Johannesburg	719.00	46,648	87.60%	2.15%	3.64%	4.05%	2.56%
SADC 40	N004	Botswana Border (Skilpadshek)	Mozambique Border (Komatipoort)	925.52	18,497	96.08%	1.07%	1.63%	0.89%	0.33%
None	N005	Harrismith	Winburg	226.23	3,018	78.75%	2.70%	4.39%	7.93%	6.24%
SADC 05	N007	Cape Town	Namibia Border (Vioolsdrift)	663.82	2,796	82.22%	2.49%	4.09%	6.40%	4.80%
SADC 50	N008	Groblershoop	Lesotho Border (Maseru)	580.49	2,014	87.16%	2.93%	4.24%	3.49%	2.18%
SADC 25/SADC 50	N010	Port Elizabeth	Namibia Border (Nakop)	953.97	733	76.39%	2.69%	5.03%	9.12%	6.78%
SADC 421/None	N011	Ermelo	Botswana Border (Martins Drift)	754.74	3,158	82.80%	2.52%	5.05%	6.07%	3.54%
SADC 15/None	N012	Three Sisters	Witbank	1,172.66	4,892	78.41%	2.36%	4.22%	8.44%	6.58%
SADC 421/None	N017	Swaziland Border (Oshoek)	Johannesburg	357.14	4,618	91.06%	1.58%	2.69%	2.89%	1.78%
SADC 15	N018	Botswana Border (Ramatlabama)	Kimberley	314.03	2,670	89.89%	1.52%	3.03%	3.54%	2.02%

SADC Road No	Road No	Origin	Destination	Length km	AVG AADT	% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
None	R022	Hluhluwe	Mozambique Border (Ponta do Ouro)	169.55	1,308	91.08%	1.55%	3.01%	2.91%	1.45%
SADC 322	R040	Nelspruit	Phalaborwa	264.75	4,248	76.96%	3.46%	6.91%	8.06%	4.61%
SADC 322	R071	Polokwane	Phalaborwa	208.41	4,964	90.02%	1.65%	3.33%	3.35%	1.67%
Grand Total				10,458.22	10,201	82.41%	2.32%	4.12%	6.47%	4.67%

3.9.3.2 Financing Needs

Based on typical unit costs for routine and periodic maintenance, the total annual funding requirements are shown in Table 3.9.5.

Table 3.9.5: South Africa Total Annual Funding Requirements (US\$)

Activity	Road Type	Total
	Paved	
Routine	59,038,361	59,038,361
Periodic	134,944,826	134,944,826
TOTAL	193,983,187	193,983,187

3.9.4 Road Network Usage

The usage of the network in terms of vehicle kilometres travelled and equivalent standard axles is shown Table 3.9.6 and Table 3.9.7, respectively.

Table 3.9.6: South Africa Road Network Usage (VKT Million)

Road Type	Annual vehicle kilometres travelled (VKT) by Vehicle Class (VKT Million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
	Paved	32089.65	904.77	1606.03	2520.23	1818.97
Unpaved	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	32089.65	904.77	1606.03	2520.23	1818.97	38939.66

Table 3.9.7: South Africa Road Network Usage (E80km Million)

Road Type	Annual E80kms travelled by Vehicle Class					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	1257.63	2248.44	7031.45	7621.50	18159.02
Unpaved	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	1257.63	2248.44	7031.45	7621.50	18159.02

3.9.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network as well as the current charges payable by vehicles, Table 3.9.8 shows the cost responsibility and cost recovery in US cent per km. Cost responsibility and cost recovery levels are also

compared by presenting the total over or under recovery by including and excluding the fuel levy. It will be noted that there is a over recovery for all vehicle types, and in the case where the fuel levy is excluded it will be noted that the 6 and 6+ heavy vehicle class has the lowest over recovery of only 0.26 US cent per kilometre compared to the over recovery of light vehicles of 0.64 US cent per kilometre.

Table 3.9.8: South Africa Total Cost Responsibility, Cost Recovery and Cost Over- (Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.16	2.86	0.80	2.70	0.64
BUS	0.94	8.19	1.74	7.25	0.80
2-3 HV	1.50	8.01	2.04	6.51	0.54
4-5 HV	2.26	11.15	2.76	8.89	0.50
6 & 6+ HV	2.92	13.34	3.17	10.42	0.26
Weighted Average	0.50	4.22	1.11	3.73	0.62

Note: Provision was made for the operation and maintenance costs of toll plazas which amount to approximately 10% of revenue from tolls.

3.9.6 Summary

South Africa is the only country of the SADC continental member states which does not levy any charges at the border posts. A significant proportion of the RTRN is tolled.

The RTRN in South Africa consists of about 10 500 km, and the average traffic levels are the highest in the SADC region of 10 200 vehicles per day. Due to the extensive RTRN in South Africa and the high design standards on the network, the annual funding requirements for routine and periodic maintenance on the RTRN are the highest in the SADC region, and amount to almost US\$194 million per annum.

3.10 Swaziland

Swaziland has about 4 900km of roads. The road network in Swaziland is managed by local authorities and the Roads Department. Local Authorities consist of Town Councils, Town Road Boards and City Councils who are responsible for managing roads in their jurisdiction. Their responsibility however excludes through roads which are either main or district roads. The Roads Department is responsible for the main and district roads as well as the feeder roads.

3.10.1 Institutional Reform Status

There is currently no Road Fund in Swaziland. However, the Government of Swaziland has committed itself to promoting sustainable and long-term economic growth and development. The Ministry of Public Works and Transport (MPWT), in support of this Government policy, is currently in the process of examining the operations of its various technical departments and ministries to enhance their efficiency.

Concerning the management of the roads sector, the Roads Department (within MPWT) is responsible for approximately 90% of all expenditure on roads in Swaziland, and the focus on reform in the roads sector is therefore on the Roads Department. The MPWT initiated a study at the beginning of 2000 to investigate restructuring options for the Roads Department, in order for it to provide services in a more commercially orientated manner.

The study proposed wide-ranging reforms in road infrastructure management and financing in Swaziland. These changes were presented to Cabinet and were approved for implementation, and the implementation project commenced in April 2004.

Road sector reform targets two areas, namely the efficient delivery of roads and the sustainable financing of roads. With respect to road delivery, the following three aspects were distinguished:

- Policy making is a core government function and is to remain a function of MPWT in Swaziland;

- Road management is an agency function which will be most effectively executed at arms-length from government proper, through a semi-autonomous Roads Agency. While a decision to establish a Swaziland Roads Agency has already been taken, the implementation of this item still needs to take place;
- Road contracting is a function that is best provided on a commercial basis. In as far as such executing functions are being provided by government, these will most probably be externalised and commercialised.

3.10.2 Current Charges levied from Road Users

Charges currently levied from road users include the entry fees and annual vehicle licence fees.

3.10.2.1 Entry Fees

Entry fees or transit fees amount to E50.00 (about US\$ 8) for Light Motor Vehicles and E80.00 (about US\$13) for Heavy Motor Vehicles.

3.10.2.2 Vehicle License Fees

Annual vehicle license fees are also levied from road users, and the levels are shown in Table 3.10.1.

Table 3.10.1: Level of Annual Vehicle License Fees in Swaziland

Tare Weight (kg)	Annual License Fee (Emalangeni)
0-250	70
250-500	80
500-750	90
750-1000	100
1000-1250	110
1250-1500	120
1500-1750	130
1750-2000	145
2000-2250	170
2250-2500	185
2500-2750	205
2750-3000	220
3000-3250	235
3250-3500	250
3500-3750	265

Tare Weight (kg)	Annual License Fee (Emalangeni)
3750-4000	290
4000-4250	300
4250-4500	315
4500-4750	330
4750-5000	345
5000-5250	360
5250-5500	375
5500-5750	390
5750-6000	405
6000-6250	420
6250-6500	435
6500-6750	450
6750-7000	465
7000-7250	480
7250-7500	495
7500-8000	525
8000-8500	555
8500-9000	585
9000-9500	615
9500-10000	645
10000-10500	675
10500-11000	705
11000-11500	735
11500-12000	765
12000-12500	795
12500-13000	825
13001-and over	900

3.10.2.3 Fuel Levies

Currently, there is not a dedicated fuel levy but the fuel price includes a fuel tax of 40 cents (6.45 US cents) on both petrol and diesel.

3.10.3 RTRN and Financing Needs

3.10.3.1 Extent of the RTRN

The extent of the RTRN in Swaziland is shown in .Table 3.10.2 shows the characteristics of the RTRN in Swaziland.

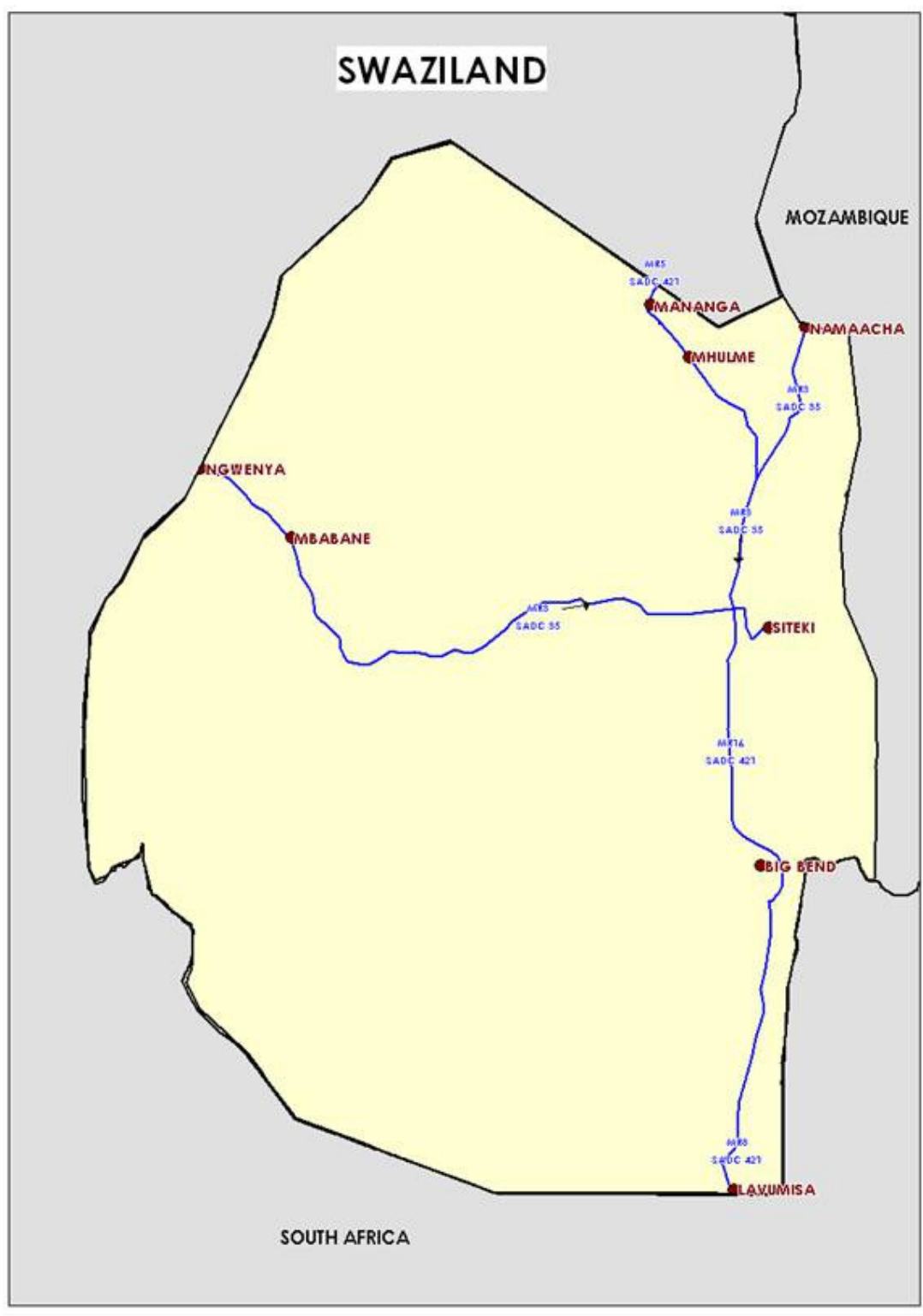


Figure 3.10.1: Swaziland RTRN Map

Table 3.10.2: Swaziland RTRN

SADC RTRN No.	Road No	Origin	Destination	Surface Type	Length	AVG AADT	% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
SADC 421	MR16	Big Bend	Junction MR7/MR3	Paved	37.93	1001	79.00%	5.00%	10.00%	3.00%	3.00%
SADC 421	MR24	Simunye/ Junction MR3	MR5 Junction	Paved	32.09	1941	80.20%	3.96%	8.91%	3.47%	3.47%
SADC 35	MR3	Ngwenya Border Post (South Africa)	Namaacha Border Post (Mozambique)	Paved	248.96	3461	86.00%	4.07%	5.86%	2.04%	2.04%
SADC 421	MR5	Junction MR24	Mananga Border South Africa	Paved	5.00	742	84.00%	6.00%	8.00%	1.00%	1.00%
SADC 35	MR7	Junction MR3/MR16	Siteki	Paved	40.18	871	81.01%	6.19%	8.74%	2.03%	2.03%
SADC 421	MR8	Lavumisa Border Post	Big Bend	Paved	76.81	1284	75.56%	2.28%	6.97%	7.59%	7.59%
TOTAL					440.97	2493	84.33%	4.01%	6.37%	2.65%	2.65%

3.10.3.2 Financing Needs

Based on typical routine and periodic maintenance costs, the total annual funding requirements are shown in Table 3.10.3.

Table 3.10.3: Swaziland Total Annual Funding Requirements (US\$)

Activity	Type	Total
	Paved	
Routine	439,844	439,844
Periodic	993,396	993,396
TOTALS	1,433,240	1,433,240

3.10.4 Road Network Usage

The usage of the road network in terms of vehicle kilometres travelled (VKT) and equivalent standard axle kilometres (E80km) is shown in Table 3.10.4 and Table 3.10.5.

Table 3.10.4: Swaziland Road Network Usage (VKT Million)

Road Type	Annual vehicle kilometres travelled (VKT) by Vehicle Class (VKT Million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
	Paved	338.35	16.07	25.58	10.61	10.61
Unpaved	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	338.35	16.07	25.58	10.61	10.61	401.23

Table 3.10.5: Swaziland Road Network Usage (E80km Million)

Road Type	Annual E80kms travelled by Vehicle Class					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	22.34	35.81	29.62	44.48	132.24
Unpaved	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	22.34	35.81	29.62	44.48	132.24

3.10.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network as well as the current charges payable by vehicles, Table 3.10.6 shows the cost responsibility and cost recovery per vehicle class in US cent per km. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery. It will be noted that there is an over-recovery for all vehicle classes, and that in the case where fuel levies are excluded the 6 and 6+ axle heavy vehicles have the lowest over-recovery.

Table 3.10.6: Swaziland Total Cost Responsibility, Cost Recovery and Cost Over- (Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.13	2.54	1.83	2.41	1.70
BUS	0.89	5.51	2.93	4.62	2.04
2-3 HV	1.29	5.31	2.93	4.03	1.64
4-5 HV	2.08	6.28	2.93	4.21	0.85
6 & 6+ HV	2.80	6.99	2.93	4.19	0.12
Weighted Average	0.36	3.05	2.00	2.69	1.64

3.10.6 Summary

The RTRN in Swaziland is the lowest in the SADC region, totalling only 440km of which is 100% paved. Traffic levels on the RTRN are on average almost 2500 vehicles per day. Due to the small extent of the RTRN, the annual funding requirements for routine and periodic maintenance are the lowest in the SADC region, and amount to about US\$ 1.4 million.

3.11 Tanzania

Tanzania has a total road network of approximately 85,000 km (including feeder, district and urban roads). The trunk and regional road network consists of 35,000 km, and the Tanzania National Roads Agency (TANROADS) is responsible for the trunk and regional road network. The Prime Minister's Office Regional Administration and Local Government (PMO-RALG) is responsible for the District Roads, Feeder Roads and Urban Roads.

3.11.1 Institutional Reform Status

In order to improve the governance of the roads sector and to secure more stable financing for road maintenance and management of the Road Fund, the United Republic of Tanzania enacted the Roads Tolls (Amendment) No. 2 Act of 1998 which established the current Road Fund and the Roads Fund Board. Furthermore, a national roads agency TANROADS was established under section 3(1) of the Executive Agencies Act, 1997.

3.11.1.1 Roads Fund Board

The Functions of the Roads Fund Board are as stipulated in Section 5(4) of the Roads Tolls(Amendment Act) No.2 of 1998. The functions of the Board with respect to the Fund are:

- a) to advise the Minister on new sources of roads tolls, adjustment of rates of existing tolls and on regulations for the collection of road tolls for the purpose of ensuring an adequate and stable flow of funds to road operations;
- b) to apply the money deposited into the Fund for the purposes approved by the Parliament;
- c) to set out procedures for agents with respect to the collection of roads tolls for the purpose of the Fund;
- d) to ensure full collection and transfer of collected roads toll to the Fund's account;
- e) to develop and review periodically the formula for Allocation and disbursement from the Fund to TANROADS, local authorities and other road agencies and advise the roads minister accordingly;

- f) to recommend to the roads Minister an allocation of funds for TANROADS, local authorities and other road agencies to undertake road management at a level that is sustainable and affordable;
- g) to disburse funds from the Fund to TANROADS, local authorities and other road agencies;
- h) to ensure that the operations of TANROADS, local authorities and other road agencies and the Fund are technically and financially sound;
- i) to monitor the use of the funds disbursed to TANROADS, local authorities and other road agencies for the purpose of the objects of the Fund;
- j) to appoint the Road Fund Manager and Road Fund Accountant;
- k) to appoint, subject to approval by the Controller and Auditor General an auditor or auditors to carry out the audit of the Fund;
- l) to make any other recommendations to the roads Minister as it considers necessary to enable the Board to achieve its objectives.
- m) In addition the Road Tolls (Amendment) No.2 Act 1998 requires the Roads Fund Board to:
 - i. enter into performance agreements with the Chief Executive of TANROADS or other agency to which money from the Fund is disbursed.
 - ii. submit an annual report to the roads Minister within three months, after the end of each financial year based upon its own activities and of those organisations to which money was disbursed.

In terms of section 4(3) of the Roads Tolls (Amendment) No. 2 Act of 1998 the Fund is mandated to use at least 90% of the money paid into the Fund for maintenance and emergency repair of classified roads¹ and related administrative costs in Mainland Tanzania. Furthermore the Fund shall use not more than 10% of the Fund's money for roads development and related administrative costs in Mainland Tanzania (section 4(4)). The monies of the Fund are ringfenced in terms of section 4(5) and shall not be used for any other purpose than those discussed above. Part III section 5(8) provides that all costs with regard to the Roads Fund Board shall be defrayed from the Road Fund.

¹ Classified roads are defined in the Amendment Act as any public road including trunk roads, regional roads, urban roads and feeder roads.

The Roads Fund Board is responsible to collect the monies listed in section 4(1) and pay it into the account of the Fund. The Roads Fund Board pays monies to the implementing agencies for the maintenance and repair of classified roads in accordance with section 4(3) and section 5(5) as well as the development of classified roads (section 4(4)).

3.11.1.2 TANROADS

The Tanzania national roads agency (TANROADS) was established on July 1, 2000 under section 3(1) of the Executive Agencies Act, 1997.

The Ministry of Infrastructure Development (previously Ministry of Works) is to provide strategic management for TANROADS by way of a policy framework under which all road maintenance and construction works are to be executed.

The Agency is headed by a Chief Executive, appointed by the Minister, with the responsibility for the day-to-day management of the Agency, proper management of the Agency's funds, property and business and for the personnel management, organization and control. The Chief Executive is accountable to the Ministry of Infrastructure Development and the Road Funds Board.

TANROADS has four functional divisions headed by four Directors with the following functions:

- maintenance;
- development;
- technical; and
- finance and administration.

In addition, TANROADS has been charged with the management and operation of the following:

- TANWEIGH—portable and fixed weighbridge operations
- TANLAB—formerly MoW Central and Regional Materials Laboratories
- EHU—Equipment Hire Units at Tanga, Morogoro, Mbeya and Kibaha

Each of these responsibilities is established within TANROADS as separate subsidiary businesses with a view to possible further rationalization or development into separate executive agencies or full privatisation.

TANROADS structure was previously based on 4 zones with 20 regions and is now based on 21 regions on Mainland Tanzania.

TANROADS deals with the development and maintenance of the trunk and regional road network.

The functions of TANROADS are as follows:

- To undertake procurement and management of contracts for design, maintenance, emergency repairs, spot improvements, rehabilitation, upgrading and construction of roads under its control.
- To improve road safety and reduce negative environmental impact in the road network under its control.
- Upon request of local authorities or road agencies, to perform any work in connection with any road under the control of such authorities or agencies, or to have it done under its supervision, for the account of that authority and charge a fee for such services.
- To establish and maintain appropriate road data banks.
- To cooperate with local authorities and road agencies with respect to long-term, annual and operational plans for roads.
- To establish and operate weigh bridge and enforce axle load control in the road network under its control.
- To oversee the establishment and operations of toll roads.
- To carry out or commission research as necessary in support of its aim and functions.
- To advise the Ministry on regulations and standards for road works.

3.11.2 Current Charges levied from Road Users

In terms of section 4(1) of the Roads Tolls (Amendment) No. 2 Act of 1998 the following monies should be paid into the Fund:

- Fuel levy (formerly known as roads toll, now corrected) on petrol and diesel;
- transit fees;

- heavy vehicle licences;
- vehicle overloading fees; and
- monies from any other source at the rate to be determined by Parliament from time to time.

3.11.2.1 Fuel levy

The price of fuel consists of several elements. These are the basic price of fuel as landed in Dar Es Salaam, distribution and transport costs, margins as well as duties, taxes and levies. The duties, taxes and levies on fuel are collected by the Tanzania Revenue Authority (TRA) and are amended from time to time. The current statutory instrument in force regarding the Excise Duty as well as the Value Added Tax (VAT) component is the Finance Act of 2001. Central Government is the beneficiary of the Excise Duty as well as the VAT component. The statutory instrument in force regarding the fuel levy accruable to the Roads Fund is the Roads Tolls Act of 1985.

The current level of the fuel levy is TShs 90 (7.5 US cents) per litre on petrol and diesel. VAT is levied at 20% of the CIF value, and the level of the Excise Duty per litre amounts to TShs 135, TShs 143 and TShs 201 for Petrol Regular, Petrol Premium and Diesel, respectively.

3.11.2.2 Transit fees

Transit fees are levied from foreign heavy vehicles (goods and passenger vehicles) and are based on the number of axles and are levied per 100km.

The levels of transit fees are as follows.

Table 3.11.1: Transit Fees Levels

Vehicle Type	Amount (US\$) per 100 km
Vehicles with up to 3 axles	6.00
Vehicles with more than 3 axles	16.00

Furthermore, foreign vehicle permit fees are collected from all foreign light vehicles (up to 2 tons), and are charged per month. Central Government is the beneficiary of revenue from foreign vehicle permit fees. The current level of foreign vehicle permit fees is US\$ 20 per month.

3.11.2.3 Heavy vehicle licence fees

Heavy vehicle licence fees were abolished around 2005.

3.11.2.4 Vehicle overloading fees

Vehicle overloading fees are to be paid for vehicles which exceed the maximum **total** weight limit in terms of Gross Vehicle Mass (GVM) (varying between 18 tons and 56 tons which are the maximum permissible weights of a two-axle truck and a truck with a drawbar trailer with a total of 6 axles, respectively), where the **steering axle** exceeds 8 tons or where one of the **other axles** exceeds 10 tons. The purpose of the fine is to limit the damage caused to roads by overloaded vehicles. The collection of overloading fees is the responsibility of TANWEIGH (the weighbridge unit of TANROADS).

The current levels of overloading fees vary for different overload limits and are based on a US\$ rate per kg overloaded.

3.11.3 RTRN and Financing Needs

3.11.3.1 Extent of the RTRN

The extent of the RTRN is shown in Figure 3.11.1 , and Table 3.11.2 shows the characteristics of the RTRN in Tanzania.



Figure 3.11.1: Tanzania RTRN Map

Table 3.11.2: Tanzania RTRN

RTRN Road Number	Road Number	Start	End	Paved (km)	Unpaved (km)	Total (km)	AADT	% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6+ HV
SADC 10/121/17	T001	Dar es Salaam	Tunduma (Zambia border)	923	0	923	2,815	75.3	11.5	8.9	2.4	1.9
SADC 35/27/25	T002	Chalinze	Namanga (Kenya border)	645	0	645	1,578	54.6	3.5	32.2	8.7	0.9
SADC 10	T003	Morogoro	Rusumo (Rwanda) border	679	491	1,170	747	79.1	2.0	14.1	3.2	1.6
SADC 111	T004	Mutukula	Sirari	449	338	787	537	93.5	0.0	6.4	0.0	0.1
SADC 25	T005	Iringa	Arusha	132	551	683	413	60.0	7.4	17.7	9.7	5.2
SADC 35	T006	Mtwara port	Makambako	532	441	974	330	62.0	9.9	21.6	1.7	4.8
SADC 35	T007	Dar es salaam	Mingoyo	201	275	476	1,210	72.8	18.8	7.1	1.0	0.3
SADC 15	T009	Tunduma	Kalebezo	18	782	800	140	48.8	0.0	29.3	14.6	7.3
SADC 25	T010	Uyole	Kasumulu(Malawi Border)	106	0	106	1,256	70.4	8.2	17.1	2.7	1.6
SADC 122	T012	Songea	Mbamba bay	24	141	164	332	76.4	6.2	17.0	0.2	0.2
SADC 27	T013	Segera	Horohoro (Kenya border)	81	58	138	1,074	58.6	10.1	20.8	6.7	3.8
TOTAL				3790	3077	6866	953	69.1	6.1	17.2	4.8	2.8

3.11.3.2 Financing Needs

Based on typical unit costs, the annual funding requirements in terms of routine and periodic maintenance is shown in Table 3.11.3.

Table 3.11.3: Total Annual Funding Requirements (US\$)

Activity	Road Type		Total
	Paved	Gravel	
Routine	6,996,138	3,023,847	10,019,985
Periodic	8,472,698	6,548,555	15,021,252
TOTALS	15,468,836	9,572,401	25,041,237

3.11.4 Road Network Usage

The usage of the road network in terms of vehicle kilometres travelled (VKT) and equivalent standard axle kilometres (E80km) is shown in Table 3.11.4 and Table 3.11.5.

Table 3.11.4: Tanzania Road Network Usage (VKT Million)

Road Type	Annual vehicle kilometres travelled (VKT) by Vehicle Class (VKT Million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	1317.53	157.69	275.26	68.46	30.86	1849.79
Unpaved	384.73	40.24	77.27	21.84	13.26	537.34
TOTAL	1702.26	197.93	352.53	90.30	44.13	2387.14

Table 3.11.5: Tanzania Road Network Usage (E80km Million)

Road Type	Annual E80kms travelled by Vehicle Class					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	219.19	385.36	191.00	129.32	924.87
Unpaved	0.00	55.94	108.17	60.92	55.58	280.61
TOTAL	0.00	275.12	493.54	251.92	184.90	1205.48

3.11.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network as well as the current charges payable by vehicles, Table 3.11.6 shows the cost responsibility and the cost

recovery in US cent per km. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery for fuel levies included and excluded, respectively. It will be noted that there is a significant difference between the cost over or under recovery levels if the fuel levies are included or excluded.

It will also be noted that in the case where the fuel levy is excluded, the cost recovery exceeds the cost responsibility in the case of light vehicles (LV). For all other vehicle classes, the cost responsibility exceeds the cost recovery.

Table 3.11.6: Tanzania Total Cost Responsibility, Cost Recovery and Cost Over- (Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.30	1.12	0.29	0.82	(0.01)
BUS	1.81	9.00	6.00	7.19	4.19
2-3 HV	2.82	18.78	16.00	15.96	13.18
4-5 HV	4.32	19.90	16.00	15.58	11.68
6 & 6+ HV	5.67	20.73	16.00	15.06	10.33
Weighted Average	1.05	5.45	3.97	4.40	2.92

3.11.6 Summary

The RTRN in Tanzania consist of 6800km of which slightly more than 50% is paved. Traffic levels on the RTRN are on average about 950 vehicles per day. The annual funding requirements for routine and periodic maintenance on the RTRN amount to about US\$25 million.

3.12 Zambia

Zambia has 37 000 km of gazetted roads and more than 30 000 km of ungazetted roads. Approximately 21 000 km of gazetted roads fall under the jurisdiction of the Ministry of Works and Supply, the rest being shared between City, Municipal and District Councils. Since independence, the emphasis in both Government and donor-funded road projects has been on opening new roads, with little attention being paid to sustainable maintenance. To address the backlog of maintenance, the Zambian Government joined the World Bank sponsored Road Maintenance Initiative in 1993, under the auspices of the Sub-Saharan African Transport Policy (SSATP) programme. This resulted in the creation of the National Roads Board in 1994, to manage and administer the Fuel Levy. Road users agreed to pay this extra amount for fuel, over and above other forms of Government tax, so that it could be dedicated to road maintenance.

The Road Fund was introduced in 1994 and its funding was to come mainly from the Fuel Levy, donors and other road user charges like vehicle licence fees, international transit tolls, weigh-bridge fines, etc. However, due to reduced economic activity in the country, the volume of fuel consumed decreased over time. Furthermore, the other road user charges (RUC) were not channelled to the Road Fund. Consequently, this arrangement did not bring about the perceived improvements in road financing and in 2002, the Zambian Government approved an updated Transport Policy, providing for further road sector reform.

3.12.1 Institutional Reform Status

Institutional reform in Zambia has progressed well over the past few years and the following new agencies have been established:

- Roads Development Agency;
- National Road Fund Agency;
- Road Transport and Safety Agency.

2.11.1.1 Roads Development Agency

This agency falls under the Ministry of Works and Supply and is responsible for managing and maintaining the entire core road network. This task will be formalised

with the reclassification of the Zambian road network, to ensure that the core network is properly defined.

RUC is currently intended to cover the cost of Routine and Periodic Maintenance, as well as Rehabilitation. Should the revenue from RUC be insufficient for this purpose, the National Road Fund Agency may continue to seek additional funding (as in the past) from Government or from donors.

3.12.1.1 National Road Fund Agency

At the end of 2004, the National Roads Board was dissolved and replaced by an autonomous National Road Fund Agency. The NRFA falls under the Ministry of Finance and is responsible for recommending RUC as well as RUC levels, and for disbursing revenue to the RDA and the Road Transport and Safety Agency.

3.12.1.2 Road Transport and Safety Agency

This agency falls under the Ministry of Communications and Transport and is responsible for vehicle and drivers' licensing functions, as well as managing all road traffic and safety programmes in Zambia. The RTSA has also been tasked with collecting RUC (except for the Fuel Levy which continues to be collected by the Zambia Revenue Authority and passed on to the Ministry of Finance). All RUC is still being paid directly to National Treasury, which implies that it becomes part of Government's General Revenue. The road sector therefore continues to compete with other Government functions for a share of the General Revenue.

3.12.2 Current Charges levied from Road Users

The Road Fund Act No. 13 of 2002 states that Road Fund revenue may consist of the following:

- Such monies as may be appropriated by Parliament;
- All Fuel Levies collected;
- A percentage of licence fees, registration fees and international transit tolls;
- Weigh bridge fines;
- Such percentage of road-user charges (including tariffs, taxes and tolls) as may be determined by the Minister;

- Such monies as may be paid to the Road Fund by way of loans, grants or donations.

As from the current financial year it has been agreed that 50% of RUC shall be paid into the Road Fund, and this percentage is meant to increase with time.

3.12.2.1 Fuel Levy

The Fuel Levy is by far the largest form of RUC in Zambia and makes up 15% of the price of fuel (before any taxes are added). Furthermore, it is currently the only source of revenue for the Road Fund.

Fuel companies are required to pay the Fuel Levy to the Ministry of Finance within 10 days of importing fuel into Zambia. (Fuel companies are therefore allowed a grace period of 10 days during which to sell the fuel.)

The level of the fuel levy during April/May 2006 was K 293 per litre or US\$ 0.09 per litre.

3.12.2.2 Vehicle Licence and Registration Fees

In Zambia, Vehicle Licence Fees are referred to as a “Road Tax”, and are levied on vehicles registered in the country. While there are only three centres where vehicles may be registered (in Lusaka, Ndola and Livingstone), there are 16 vehicle licensing centres. These fees are paid in cash.

Table 3.12.1: Zambia Vehicle Registration Fee and Driving Licence Levels

SCHEDULE OF FEES		
(All vehicles)		
ITEM		AMOUNT (Kwacha)
1.	Registration Book	100, 000.00
2.	New Vehicle Registration Mark	63, 000.00
3.	Duplicate Registration Book	100, 000.00
4.	Temporal Registration (point of entry)	50, 000.00
5.	Change of ownership	18, 000.00
6.	Duplicate Motor Vehicle License	10, 800.00
7.	Assignment of Registration Mark	900, 000.00

SCHEDULE OF FEES		
(All vehicles)		
ITEM		AMOUNT (Kwacha)
8.	Assignment of Registration Mark which is not in current use	450, 000.00
9.	Change of registration particular (for each change)	18, 000.00
10.	Examination of Motor Vehicle for change of Registration particulars	21, 600.00
11.	Examination of Motor Vehicle for change of Ownership	21, 600.00
12.	Motor Vehicle License (as per schedule of motor vehicle weights)	
13.	Appeal to the Commissioner	36, 000.00
DRIVING LICENSES		
1.	Driving License	60, 000.00
2.	Duplicate Driving License	60, 000.00
3.	International Driving Permit	27, 000.00
4.	Extension of License by endorsement (i.e. addition of class)	50, 000.00
5.	Renewal of Public Service License	50, 000.00
6.	Driving Test	36, 000.00
7.	Provisional Driving License	10, 800.00
8.	Appeal to the commissioner	36, 000.00
9.	Appeal to the Minister	45, 000.00

Table 3.12.2: Schedule of Motor vehicle licence fees (Kwacha)

	CATEGORIES OF VEHICLES	ONE QUARTER	TWO QUARTERS	THREE QUARTERS	FULL YEAR
1	Vehicle owned by government	Nil	Nil	Nil	Nil
2	For every hand-cart per wheel	600	1 100	1 700	2 000
3	For every Motor cycle	3 000	5 500	8 500	10 000
4	For every Motor Vehicle if the manufacturers permitted Gross Weight:				
(a)	Does not exceed 800kgs	18 000	33 000	51 000	60 000
(b)	Exceeds 800kgs but does not exceed 1000kgs	24 000	44 000	68 000	80 000
(c)	Exceeds 1000kgs but does not exceed 1200kgs	30 000	55 000	85 000	100 000
(d)	Exceeds 1200kgs but does not exceed 1400kgs	36 000	66 000	102 000	120 000

	CATEGORIES OF VEHICLES	ONE QUARTER	TWO QUARTERS	THREE QUARTERS	FULL YEAR
(e)	Exceeds 1400kgs but does not exceed 1600kgs	42 000	77 000	119 000	140 000
(f)	Exceeds 1600kgs but does not exceed 2000kgs	45 000	82 500	127 500	150 000
(g)	Exceeds 2000kgs but does not exceed 4000kgs	48 000	88 000	136 000	160 000
(h)	Exceeds 4000kgs but does not exceed 6000kgs	51 000	93 500	144 500	170 000
(i)	Exceeds 6000kgs but does not exceed 9000kgs	54 000	99 000	153 000	180 000
(j)	Exceeds 9000kgs but does not exceed 12000kgs	57 000	104 500	161 500	190 000
(k)	Exceeds 12000kgs but does not exceed 15000kgs	60 000	110 000	170 000	200 000
(l)	Exceeds 15000kgs but does not exceed 17000kgs	63 000	115 500	178 500	210 000
(m)	Exceeds 17000kgs but does not exceed 20000kgs	66 000	121 000	187 000	220 000
(n)	Exceeds 20000kgs	90 000	165 000	255 000	300 000
5	For each identification No. included in a Motor dealers vehicle license	6, 000	11, 000	17, 000	20, 000
6	For every farm vehicle license	12, 000	22, 000	34, 000	40, 000
7	For every farm tractor used on a road other than in accordance with farm vehicle License	18, 000	33, 000	51, 000	60, 000

Note:

- (1) For every vignette or pickup add 1000kgs to the Net weight to arrive at the required gross weight
- (2) The schedule is revised in accordance with the Roads and Road Traffic ACT 464 Section 95 sub section 2 and effective from the year 2000. Licenses as flows: "For every annual license for a motor vehicle or trailer the tax shall be as specified in the said schedule: for every half-yearly license there shall be paid fifty-five percentum of the said tax, and for every quarterly license thirty percentum to the said tax".

3.12.2.3 International Transit Tolls

International transit tolls (or cross-border charges) are collected from foreign buses and heavy goods vehicles (HV), at their point of entry into Zambia. Three separate rates are levied, as follows:

- US\$ 5/100km - Buses;
- US\$ 6/100km - HV up to 3 axles;
- US\$10/100km - HV with more than 3 axles.

These transit tolls are paid in cash and are levied according to the distance each vehicle is to travel while inside Zambia. In order to keep track of each vehicle, permits are issued which state the destination of each vehicle.

Table 3.12.3: Schedule of Transit Tolls

SCHEDULE OF TRANSIT TOLLS					
(Foreign Vehicles)					
	ROUTE	DISTANCE	BUSES	RIGID VEHICLE WITH UP TO 3 AXLES	VEHICLE WITH MULTIPLE AXLES
		(Km)	(US\$)	(US \$)	(US \$)
1.	CHIRUNDU-KAFUE	90	5.00	6.00	10.00
2.	CHIRUNDU-LUSAKA	136	7.00	8.00	14.00
3.	KAZUNGULA-SESHEKE	136	7.00	8.00	14.00
4.	KAZUNGULA-LIVINGSTONE	60	5.00	4.00	6.00
5.	SHESHEKE-LIVINGSTONE	190	10.00	11.00	19.00
6.	KAZUNGULA-MONGU	440	22.00	26.00	44.00
7.	LIVINGSTONE-KALOMO	126	6.00	8.00	13.00
8.	LIVINGSTONE-CHOMA	188	9.00	11.00	19.00
9.	LIVINGSTONE-MONZE	250	13.00	15.00	25.00
10.	LIVINGSTONE-MAZABUKA	350	18.00	21.00	35.00
11.	LIVINGSTONE-KAFUE	430	22.00	26.00	43.00
12.	LIVINGSTONE-LUSAKA	470	24.00	28.00	47.00
13.	CHIRUNDU-KABWE	270	14.00	16.00	27.00
14.	LUSAKA-KABWE	138	7.00	8.00	14.00
15.	LUSAKA-KAPIRI MPOSHI	200	10.00	12.00	20.00
16.	LUSAKA-NDOLA	320	16.00	19.00	32.00
17.	LUSAKA-KITWE	358	18.00	21.00	36.00

SCHEDULE OF TRANSIT TOLLS					
(Foreign Vehicles)					
	ROUTE	DISTANCE	BUSES	RIGID VEHICLE WITH UP TO 3 AXLES	VEHICLE WITH MULTIPLE AXLES
		(Km)	(US\$)	(US \$)	(US \$)
18.	LUSAKA-LUANSHYA	330	17.00	20.00	33.00
19.	LUSAKA-MUFULIRA	400	20.00	24.00	40.00
20.	LUSAKA-CHINGOLA	410	21.00	25.00	41.00
21.	CHIRUNDU-KASUMBALESA	578	29.00	35.00	58.00
22.	CHIRUNDU-MWAMI	745	37.00	45.00	75.00
23.	CHIRUNDU-NAKONDE	1150	58.00	69.00	115.00
24.	LUSAKA-KASAMA	852	43.00	51.00	85.00
25.	LUSAKA-MBALA	1015	51.00	61.00	102.00
26.	LUSAKA-MANSA	590	30.00	35.00	59.00
27.	KASUMBALESA-NAKONDE	1014	51.00	61.00	101.00
28.	KASUMBALESA-MWAMI	1035	52.00	62.00	103.00
29.	NDOLA-LUANSHYA	32	2.00	2.00	32.00
30.	NDOLA-CHINGOLA	110	6.00	7.00	11.00
31.	NDOLA-MONGU	800	40.00	48.00	80.00
32.	NDOLA-MULUNGU	960	48.00	58.00	96.00
33.	LUSAKA-LUNDAZI	780	39.00	47.00	78.00
34.	LUSAKA-MPULUNGU	1050	53.00	63.00	105.00
35.	CHIPATA-MPULUNGU	1657	83.00	99.00	166.00
36.	VICTORIA FALLS LUSAKA	480	24.00	29.00	48.00
37.	VICTORIA FALLS-SESHEKE	200	10.00	12.00	20.00
38.	KABWE-NAKONDE	878	44.00	53.00	88.00
39.	KABWE-MWAMI	740	37.00	44.00	74.00
40.	KITWE-CHIRUNDU	495	25.00	30.00	50.00
41.	MUFULIRA-KAZUNGULA	818	41.00	49.00	82.00
42.	MUFULIRA-CHIRUNDU	520	26.00	31.00	52.00
43.	KITWE-KAZUNGULA	890	45.00	53.00	89.00
44.	NDOLA KAZUNGULA	850	43.00	51.00	85.00
45.	NDOLA-MWAMI	920	46.00	55.00	92.00
46.	MWAMI-KAZUNGULA	1135	57.00	68.00	114.00
47.	LUSAKA-NYIMBA	320	16.00	19.00	32.00
48.	LUSAKA-MWINILUNGA	945	48.00	57.00	95.00
49.	NDOLA-MWINILUNGA	570	29.00	34.00	57.00

SCHEDULE OF TRANSIT TOLLS					
(Foreign Vehicles)					
	ROUTE	DISTANCE	BUSES	RIGID VEHICLE WITH UP TO 3 AXLES	VEHICLE WITH MULTIPLE AXLES
		(Km)	(US\$)	(US \$)	(US \$)
50.	KASAMA-LUSAKA	850	43.00	51.00	85.00
51.	CHIRUNDU-LIVINGSTONE	498	25.00	30.00	50.00
52.	CHIRUNDU-KAZUNGULA	568	28.00	33.00	57.00
53.	CHIRUNDU-KATIMA MULILO	688	34.00	41.00	69.00

3.12.2.4 Carbon Tax

This tax came into effect on 1 April 2006 and is currently only collected from foreign vehicles, at their point of entry into Zambia. It is payable in cash to customs officials, on an annual basis. The legislation is currently being amended to allow for the future taxing of locally registered vehicles as well.

Table 3.12.4: Carbon Tax Levels

Description	Surtax Rate		Remarks
Carbon emissions from motor vehicles and cycles of headings 8702, 8703, 8704 excluding emissions from ambulances and prison vans	Engine Capacity	Unity Tax (Kwacha)	The rate is payable annually except for motor vehicles on Temporary Importation permits
	Motor Cycles	50,000	
	0 – 1500cc	50,000	
	1501 – 2000cc	100,000	
	2001-3000cc	150,000	

Description	Surtax Rate		Remarks
	3001cc +	200,000	

The carbon tax is currently not regarded by the Zambian Government as RUC, as it does not revert to the upkeep of any roads. The revenue from this tax is solely for the use of the Ministry of Environment, to deal with environmental concerns related to carbon emissions.

3.12.2.5 Toll Roads

A legal framework for the tolling of existing routes is currently being prepared. The actual tolling of roads will therefore not take place in the near future.

3.12.2.6 Other Road-user Charges

The Municipal Councils of Chirundu (Zimbabwe border) and Kasumbulesa (the Democratic Republic of Congo border - just north of Chililabombwe) levy their own tax on heavy vehicles. Once again, this tax is not regarded as RUC. It is assumed that this income is used to keep the towns clean, as it does not appear to be channelled through to the general revenue stream.

3.12.3 RTRN and Financing Needs

3.12.3.1 Extent of the RTRN

The Zambian regional trunk road network (RTRN) consists of six separate routes, with a total length of 2 968 km, of which 94 km is unpaved. On a scale of Good, Fair or Poor, 64% can be classified as Good, while the rest is regarded as being Fair. The RTRN links the capital Lusaka, with six of Zambia's neighbours namely, Angola, the DRC, Malawi, Mozambique, Tanzania and Zimbabwe.

The links of the RTRN for Zambia are shown in Figure 3.12.1, and Table 3.12.5 shows the characteristics of the RTRN.



Figure 3.12.1: Zambia RTRN Map

Table 3.12.5: Zambia RTRN

RTRN Number	Road Section Number	Count Station Number	Origin	Destination	Road Surface	Length (km)	AADT	% Vehicle Split				
								LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV
SADC 15	T1	61	South of Livingstone	-	Paved	-	1920	87	2	9	2	
		1	Livingstone B.P. (Zimbabwe)	Choma	Paved	222	540	64	14	6	16	
		2	Choma	Monze	Paved	105	1752	42	11	15	32	
		46	Monze	Kafue	Paved	95	1050	61	15	9	15	
SADC 22/15	T2	-	Chirundu B.P (Zimbabwe)	Kafue	Paved	92	-	-	-	-	-	
		-	Kafue	Lusaka	Paved	54	-	-	-	-	-	
		3	Lusaka	Kabwe	Paved	138	3514	65	9	13	13	
		72	Kabwe	Kapiri Mposhi	Paved	58	1281	65	6	12	17	
		-	Kapiri Mposhi	Nakonde B.P. (Tanzania)	Paved	808	-	-	-	-	-	
SADC 105/105a	T3	8	Kapiri Mposhi	Ndola	Paved	115	1167	70	7	17	6	

RTRN Number	Road Section Number	Count Station Number	Origin	Destination	Road Surface	Length (km)	AADT	% Vehicle Split				
								LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV
		76	Ndola	Chingola	Paved	110	803	80	0.5	11.5	8	
		-	Chingola	Kasumbulesa B.P. (DRC)	Paved	35	-	-	-	-	-	
SADC 20	T4	10	Lusaka	Nyimba	Paved	287	249	69	10	8	13	
		261	Nyimba	Katete	Paved	153	196	26	8	34	32	
		11	Katete	Chipita	Paved	80	381	86	2	5	7	
		-	Chipita	Mwami B.P. (Malawi)	Paved	18	-	-	-	-	-	
SADC 105	T5	13	Chingola	Mwinilunga	Paved	449	50	68	16	10	6	
		-	Mwinilunga	Jimbe B.P. (Angola)	Unpaved	94	-	-	-	-	-	
SADC 24	T6	11A	Katete	Chanida B.P. (Mozambique)	Paved	55	38	59	2	24	15	
Total						2968	1238	64.2	9.6	6.2	6.2	

3.12.3.2 Financing Needs

Based on typical Routine and Periodic Maintenance costs for Zambia, the total annual funding requirements are shown in Table 3.12.6.

Table 3.12.6: Zambia Total Annual Funding Requirements (US\$)

Activity	Type		Total
	Paved	Unpaved	
Routine	4,207,151	110,100	4,317,252
Periodic	6,469,407	96,185	6,565,591
TOTAL	10,676,558	206,285	10,882,843

3.12.4 Road Network Usage

As could be expected, the route carrying the most traffic is the portion of Trunk Road 2 (T2) both north and south of Lusaka, with an average annual daily traffic (AADT) count of more than 900 heavy goods vehicles. The reason for this high flow of heavy vehicles is twofold. At Kafue south of Lusaka, the T2 from Chirundu joins the T1 from Livingstone (which both border on Zimbabwe). At Kapiri Mposhi north of Lusaka, the T2 from Tunduma (Tanzanian border) joins the T3 from Jimbe (Angolan border) and Chililabombwe (DRC border). Therefore, all heavy goods vehicles from south of Zambia travelling to Tanzania, Angola and the DRC, travel along this route.

The usage of the RTRN in terms of vehicle kilometres travelled and equivalent standard axles is shown in Table 3.12.7 and Table 3.12.8, respectively.

Table 3.12.7: Zambia Road Network Usage (VKT Million)

Road Type	Annual VKT by Vehicle Class (VKT million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
SADC RTRN						
Paved	860.78	108.36	84.04	84.04	201.79	1338.99
Unpaved	1.17	0.27	0.09	0.09	0.10	1.72
TOTAL	861.94	108.63	84.12	84.12	201.89	1340.71

Table 3.12.8: Zambia Road Network Usage (E80km Million)

Road Type	Annual E80kms travelled by Vehicle Class (E80km million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	150.62	117.65	234.46	845.48	1348.21
Unpaved	0.00	0.38	0.12	0.24	0.43	1.17
TOTAL	0.00	151.00	117.77	234.70	845.91	1349.38

3.12.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network, Table 3.12.9 shows the cost responsibility in US cent per km. It also shows the cost recovery from vehicles. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery for fuel levies included and excluded, respectively. It will be noted that there is a significant difference between the cost over or under recovery levels if the fuel levies are included or excluded. Moreover, in both cases cost over-recovery occurs for all vehicle classes.

Table 3.12.9: Zambia Total Cost Responsibility, Cost Recovery and Cost Over-(Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.12	2.17	1.18	2.05	1.06
BUS	0.93	10.96	7.36	10.02	6.42
2-3 HV	1.28	11.70	8.37	10.42	7.09
4-5 HV	2.13	17.05	12.37	14.92	10.24
6 & 6+ HV	2.93	18.03	12.36	15.10	9.43
Weighted Average	0.81	6.80	4.52	5.99	3.71

3.12.6 Summary

The RTRN in Zambia consist of about 3000 km of which about 3% is unpaved. Traffic levels on the RTRN are on average about 1240 vehicles per day. The annual funding requirements for routine and periodic maintenance on the RTRN amount to about US\$10.9 million.

3.13 Zimbabwe

3.13.1 Institutional Reform Status

Institutional reform is currently taking place in Zimbabwe and the following entities have been established:

- National Road Administration
- Road Fund.

A dedicated Roads Agency, however, has not yet been set up.

3.13.1.1 Zimbabwe National Road Administration (ZINARA)

ZINARA falls under the Ministry of Transport and Communication (MTC) and was established in August 2001, in terms of the Roads Act of 2001. It consists of a part-time Board of Directors which serves for a three year period, and a full-time CEO.

Five public sector, five private sector and three agricultural sector entities, each present three names to the Minister of Transport, as prospective board members. The Minister in turn recommends one name from each entity to the State President, who then formally appoints the board. As the previous board's term of office expired at the end of February 2006, the names of prospective new board members were presented to the Minister in August 2005. However, in May 2006, no new board had yet been appointed. The CEO is therefore attempting to administer ZINARA on his own.

ZINARA's functions are as follows:

- To fix the levels of road user charges (RUC);
- To collect RUC as well as other revenue of the Road Fund;
- To allocate and disburse revenue from the Road Fund to road authorities;
- To audit the use of funds from the Road Fund;
- To monitor the implementation of road maintenance works by road authorities.

3.13.1.2 The Road Fund

The Road Fund was established in terms of the Roads Act of 2001 with the objective to provide a stable, adequate, secure and sustainable source of funding for road maintenance work in Zimbabwe. The Road Fund consists of the following:

- Road user charges
- Appropriations from Parliament
- Grants or donations
- Any other monies that may accrue to the Road Fund.

Revenue from the Road Fund is used for:

- Routine and periodic road maintenance
- Road safety activities and other projects approved by the ZINARA Board
- The cost of administering ZINARA
- Any other activities authorised by the Board, with the consent of the Minister.

3.13.1.3 Roads Agency

While it is clear that a dedicated Roads Agency, with a CEO and a Board of Directors, is required, this entity has not yet been established. Various studies have been undertaken, but the actual route to be taken in this regard has yet to be decided upon. Current thinking is that the Roads Agency should also have authority over the county's border posts.

3.13.2 Current Charges levied from Road Users

Road User Charges are defined in the Roads Act as the following (although not all RUC is currently being deposited into the Road Fund):

- Fuel levy
- Vehicle licence fees
- Heavy vehicle surcharge
- Abnormal load charges
- International transit tolls

However, the following charges are also levied on motor vehicles in Zimbabwe:

- Road access toll
- Carbon tax

- Imported fuel tax

Additional road tolls are also due to be levied on all motor vehicles travelling within Zimbabwe in the near future.

3.13.2.1 Fuel Levy

The Fuel levy is the largest form of RUC in Zimbabwe, even though it only makes up 5% of the “landed price” of fuel. Fuel companies are required to pay the Fuel Levy to the Zimbabwe Revenue Authority (ZIMRA) which deposits the majority of the revenue into the Consolidated Revenue Fund (CRF), through the Ministry of Finance (MoF). The rest accrues to ZINARA.

The level of the fuel levy during April/May 2006 was US\$ 0.03 per litre.

3.13.2.2 Vehicle Licence Fees

Vehicle Licence Fees are paid in cash and are collected by the Central Vehicle Registry (CVR), through Local Authorities and Rural District Councils. However, these fees vary from one Authority to another, as shown in the table below (for Harare, Bulawayo and Chitungwiza). Licence fees may be paid annually, or per term (i.e. for four months at a time). A portion of the revenue from Vehicle Licence Fees is retained for use by LAs and RDCs, while the rest is deposited in the Traffic and Legislation Fund, which is administered by MTC.

Table 3.13.1: Zimbabwe Vehicle Licence Fee Levels

CLASS OF VEHICLE	NET MASS (kg)	HARARE (Zim \$)	BULAWAYO (Zim \$)	CHITUNGWIZA (Zim \$)
Light Motor Vehicle	Up to 2 300	2 400 000	54 000	840 000
Bus	-	15 617 886	373 200	5 208 000

CLASS OF VEHICLE	NET MASS (kg)	HARARE (Zim \$)	BULAWAYO (Zim \$)	CHITUNGWIZA (Zim \$)
Heavy Motor Vehicles	2301 – 4 600	9 840 867	214 800	3 318 000
	4 601 – 9 000	12 594 900	313 200	4 263 000
	Over 9 000	15 617 886	373 200	5 208 000

3.13.2.3 Heavy Vehicle Surcharge

This surcharge is levied annually on local heavy vehicles only, and collected in terms of the Vehicle Registration and Licensing Act by CVR. Five percent of the revenue is deposited in MTC Traffic and Legislation Fund, while the rest accrues to the CRF through MoF. The same amounts are levied throughout Zimbabwe, as follows:

- Zim \$ 2 400 000 for buses;
- Zim \$ 1 500 000 for a net mass up to 2 300 kg;
- Zim \$ 2 100 000 for a net mass of 4 601 to 9 000 kg;
- Zim \$ 2 400 000 for a net mass of more than 9 000 kg.

3.13.2.4 Abnormal Load Charges

Abnormal load charges and fines for overloading are collected by the Vehicle Inspectorate and paid directly to ZINARA. Overloading fines are levied at a rate of Zim\$10 000 per kilogram.

Abnormal Load Charges are set out in the table below:

Table 3.13.2: Zimbabwe Abnormal Load Charge Levels

VEHICLE MASS (kg/axle)	AMOUNT CHARGED	
	Locally Registered Vehicles (Zim \$)	Foreign Registered Vehicles (US \$)
3 750 – 4 350	2 000 000	20.00
4 351 – 4 550	3 200 000	30.00
4 551 – 4 750	3 700 000	40.00
4 751 – 5 000	4 600 000	50.00
Vehicle Registration Fee	15 000 000	300.00

3.13.2.5 International Transit Tolls

International transit tolls (or cross-border charges) are collected from foreign buses and heavy goods vehicles (HV), at their point of entry into Zimbabwe. These tolls are levied according to the distance each vehicle is to travel while inside Zimbabwe. Payment is by coupons which are purchased in advance from MTC Vehicle Inspectorate Department, in foreign currency. This revenue is paid to ZINARA. In order to keep track of each vehicle along the RTRN, permits are issued which state the destination of each vehicle. Three separate sets of rates are levied, as follows:

- US\$25/100km for all vehicles registered in Mozambique;
- The following charges are levied from Malawian registered vehicles:
 - US\$ 7/100km - Buses;
 - US\$ 14/100km - HV up to 3 axles;
 - US\$ 18/100km - HV with more than 3 axles.
- All other vehicles registered outside of Zimbabwe are charged according to the routes travelled, as set out in the table below¹:

¹ The level of the international transit fees payable by other vehicles registered outside Zimbabwe amount to approximately US\$ 5.95/100km – Buses, US\$ 7.80/100km - HV up to 3 axles and US\$ 10.00/100km - HV with more than 3 axles.

Table 3.13.3: Schedule of International Transit Tolls (US\$) for Foreign Vehicles

ROUTE		BUSES		UP TO 3 AXLES		3 AXLES +	
		SJ	RJ	SJ	RJ	SJ	RJ
1	Bulawayo-Beitbridge	19	38	25	51	32	64
2	Bulawayo-Gweru	9	19	13	26	16	32
3	Bulawayo-Harare	26	52	35	70	43	87
4	Bulawayo-Hwange	19	39	26	52	33	66
5	Bulawayo-Kwekwe	13	27	18	36	22	45
6	Bulawayo-Mbalabala	4	8	5	11	7	14
7	Bulawayo-Plumtree	6	12	8	16	10	20
8	Bulawayo-Victoria Falls	26	52	35	70	43	87
9	Harare-Beitbridge	34	69	46	92	58	116
10	Harare-Chinhoyi	6	13	9	18	11	23
11	Harare-Chirundu	21	42	28	56	35	70
12	Harare-Gweru	16	33	22	44	27	55
13	Harare-Kwekwe	12	25	17	34	21	42
14	Harare-Kariba	21	43	29	58	36	73
15	Harare-Masvingo	17	35	23	46	29	58
16	Harare-Mutare	16	33	22	44	27	55
17	Harare-Nyamapanda	14	28	19	38	27	47
18	Masvingo-Beitbridge	17	34	23	46	28	57
19	Masvingo-Gweru	11	22	14	29	18	36
20	Masvingo-Mbalabala	12	25	17	34	21	43
21	Masvingo-Mutare	17	35	23	47	29	59
22	Masvingo-Zvishavane	5	11	7	15	9	19
23	Mutare-Forbes	1	3	2	4	2	5
24	Mutare-Nyamapanda	17	34	22	45	28	57
25	Victoria Falls-Kazungula	4	8	5	11	7	14

3.13.2.6 Road Access Toll

The Road Access Toll is levied at border posts, on local and foreign light motor vehicles, as well as on local heavy motor vehicles entering Zimbabwe. International Transit Tolls are already levied from foreign heavy vehicles, and they are therefore exempt from paying the Road Access Toll. A flat rate, in cash, is charged for each of three categories of vehicles, as shown in the table below:

Table 3.13.4: Zimbabwe Levels of Road Access Tolls

VEHICLE TYPE	AMOUNT CHARGED			
	ZIMBABWE Dollar	BOTSWANA Pula	SOUTH AFRICAN Rand	US Dollar
Foreign light motor vehicle	-	50	60	10
Local light motor vehicle	300 000	-	-	-
Local heavy vehicle	600 000	-	-	-

Foreign vehicles must pay in any one of three foreign currencies, as shown in the table. Local vehicles may pay in foreign currency, or in Zimbabwe Dollars. This toll is collected by ZIMRA on behalf of MTC and is utilised to maintain the road network.

3.13.2.7 Carbon Tax

The Carbon Tax is currently being levied in two separate ways. Firstly, it is levied in cash and valid for 30 days, on foreign vehicles, at border (entry) points, over four classes of vehicle, as shown in the table below:

Table 3.13.5: Zimbabwe Carbon Tax Levels

ENGINE CAPACITY	AMOUNT CHARGED	
	US Dollar	SOUTH AFRICAN Rand
Up to 1 500cc	72-00	432-00
1501 to 2000cc	132-00	792-00
2001 to 3000cc	180-00	1 030-00
More than 3000cc	360-00	2 160-00

Secondly, it forms part of the fuel price, at a rate of Zim\$1000 per litre. In both instances, the Carbon Tax is collected by ZIMRA and is paid into the CRF through the MoF.

3.13.2.8 Imported Fuel Tax

This tax is charged on the carrying of fuel in any type of container, other than the fuel which is in a vehicle's own fuel tank. It is levied in cash at each border post, from both local and foreign vehicles, at a rate of 1000 Zimbabwe Dollars, per litre. (Official fuel importers pay directly to ZIMRA and obtain permits which are presented at border posts.) The Imported Fuel tax is collected by ZIMRA on behalf of the MoF, and is paid directly to the CRF.

3.13.2.9 Road Tolls

Road Tolls are to be levied over a period of time, in three phases in Zimbabwe. Firstly in December 2005, Road Access Tolls were introduced at all border posts, and (as stated above) are levied on all local and foreign light motor vehicles, as well as on local heavy motor vehicles entering Zimbabwe.

The second phase will be to build toll-plazas some time in the near future, to levy road tolls at the periphery of certain cities. Finally, toll-plazas are to be constructed on eight routes between various cities – one plaza in each of the eight provinces. Phases two and three will levy road tolls from ALL vehicles passing through the respective plazas.

Roads will be tolled in their current condition and the revenue collected from toll-fees will apparently not be channelled to CRF, but rather be used to upgrade the country's roads. Alternative routes to those being tolled, will not be provided.

3.13.3 RTRN and Financing Needs

3.13.3.1 Extent of the RTRN

The Zimbabwean RTRN falls under the jurisdiction of MTC. It links the capital Harare, with four of Zimbabwe's neighbours namely, Botswana, Mozambique, South Africa and Zambia. This network consists of nine separate routes, with a total length of 2 862 km, of which 138 km is unpaved. Most of the roads are 7m wide, with 1,5m unpaved shoulders. On a scale of Good, Fair or Poor, 64% can be classified as Fair, while the rest is regarded as being Poor.

The Poor sections consist of the following two routes:

- Harare to Beit Bridge
- Harare to Plumtree (via Bulawayo).

These two important routes have been carrying large volumes of heavy vehicles for more than thirty years, with regular routine maintenance (including pothole patching), but only very irregular periodic maintenance, taking place. Both routes are rutted and the pavement is failing in many places. As major rehabilitation will be required on both of these routes, MTC is considering the construction of completely new roads along these two routes. Once completed, the current roads would then be

rehabilitated, creating “dual highways” along the Harare/Beit Bridge and Harare/Plumtree routes.

The extent of the RTRN in Zimbabwe is shown in Figure 3.13.1, and Table 3.13.6 shows the characteristics of the RTRN.



Figure 3.13.1: Zimbabwe RTRN Map

Table 3.13.6: Zimbabwe RTRN

RTRN Number	Road Section Number	Map Section Number	Origin	Destination	Road Surface	Condition (Excellent, Good, Fair, Poor, Bad)	Length (km)	AADT	% Vehicle Split				
									% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
SADC 22	901	A1	Chirundu B.P. (Zambia)	Karoi	Paved	Fair	135	1 116	62	10	13	1	14
SADC 22			Karoi	Chinhoyi	Paved	Fair	105	2 183	71	8	10	3	8
SADC 22			Chinhoyi	Nyabira	Paved	Fair	77	2 972	66	8	11	3	12
SADC 22			Nyabira	Harare	Paved	Fair	35	3 455	67	9	13	4	7
SADC 25	202	A2	Nyamapanda B.P. (Mozambique)	Suswe	Paved	Fair	70	484	55	11	9	3	22
SADC 25			Suswe	Murewa	Paved	Fair	90	820	58	10	11	2	19
SADC 25			Murewa	Juru	Paved	Fair	25	1 476	70	8	9	2	11
SADC 25			Juru	Harare	Paved	Fair	45	2 437	84	7	5	1	3
SADC 30	203	A3	Mutare / Forbes B.P. (Mozambique)	Nyazura	Paved	Fair	80	5 387	86	4	6	1	3

RTRN Number	Road Section Number	Map Section Number	Origin	Destination	Road Surface	Condition (Excellent, Good, Fair, Poor, Bad)	Length (km)	AADT	% Vehicle Split				
									% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
SADC 30			Nyazura	Headlands	Paved	Fair	51	3 127	76	6	9	3	6
SADC 30			Headlands	Marondera	Paved	Fair	66	2 077	81	5	6	2	6
SADC 30			Marondera	Harare	Paved	Fair	74	4 402	77	6	7	2	8
SADC 25	304	A4	Harare	Beatrice	Paved	Poor	65	2 222	59	10	8	4	19
SADC 25			Beatrice	Mvuma	Paved	Poor	151	1 022	58	7	5	2	28
SADC 25			Mvuma	Masvingo	Paved	Poor	76	1 419	48	7	6	5	34
SADC 25	504		Masvingo	Ngundu	Paved	Poor	100	1 236	58	5	6	2	29
SADC 25			Ngundu	Rutenga	Paved	Poor	55	1 394	52	6	6	4	32
SADC 25			Rutenga	Beit Bridge B.P. (South Africa)	Paved	Poor	138	1 344	52	10	6	3	29
SADC 211	905	A5	Harare	Norton	Paved	Poor	45	5 741	77	11	7	2	3
SADC 211			Norton	Chegutu	Paved	Poor	72	2 856	78	9	6	2	5

RTRN Number	Road Section Number	Map Section Number	Origin	Destination	Road Surface	Condition (Excellent, Good, Fair, Poor, Bad)	Length (km)	AADT	% Vehicle Split				
									% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
SADC 211	805		Chegutu	Kwekwe	Paved	Poor	103	1 652	77	5	8	2	8
SADC 211			Kwekwe	Gweru	Paved	Poor	55	4 292	78	6	8	2	6
SADC 30			Gweru	Shangani	Paved	Poor	70	2 084	70	10	7	4	9
SADC 30			Shangani	Ntabazinduna	Paved	Poor	59	1 642	74	9	6	4	7
SADC 30			Ntabazinduna	Bulawayo	Paved	Poor	35	2 520	72	6	6	4	12
SADC 15			606	A6	Bulawayo	Turn-off to Masvingo	Paved	Fair	71	826	86	3	4
SADC 15	606	A6	Turn-off to Masvingo	West Nicholson	Paved	Fair	105	708	82	3	4	2	9
SADC 15			West Nicholson	Makado	Paved	Fair	60	998	83	2	7	2	6
SADC 15			Makado	Beit Bridge B.P. (South Africa)	Paved	Fair	85	2 139	78	5	7	2	8
SADC 304			607	A7	Bulawayo	Marula	Paved	Fair	75	791	84	5	8

RTRN Number	Road Section Number	Map Section Number	Origin	Destination	Road Surface	Condition (Excellent, Good, Fair, Poor, Bad)	Length (km)	AADT	% Vehicle Split				
									% LV	% BUS	% 2-3 HV	% 4-5 HV	% 6 & 6+ HV
SADC 304			Marula	Plumtree B.P. (Botswana)	Paved	Fair	25	949	86	4	7	1	2
SADC 15	708	A8	Bulawayo	Halfway House	Paved	Fair	230	634	61	5	12	4	18
SADC 15			Halfway House	Hwange	Paved	Fair	105	597	65	3	9	2	21
SADC 15			Hwange	Victoria Falls B.P. (Zambia)	Paved	Fair	105	416	54	4	28	2	12
SADC 33	n/a	n/a	Rutenga	Sango B.P. (Mozambique)	Unpaved	Good	55	100	70	7	8	2	12
TOTAL							2848	1666	67.9	6.7	8.7	2.6	14.1

3.13.3.2 Financing needs

The calculation of maintenance costs is hampered by rampant inflation in Zimbabwe, which in May 2006 was reported to be 1100% per annum. The implication of this is the fact that the cost of goods and services almost doubles each month.

Based on typical Routine and Periodic Maintenance costs for Zimbabwe, the total annual funding requirements are shown in Table 3.13.7.

Table 3.13.7: Zimbabwe Total Annual Funding Requirements (US\$)

Activity	Type		Total
	Paved	Unpaved	
Routine	4,088,578	64,420	4,152,999
Periodic	6,287,075	56,278	6,343,353
TOTAL	10,375,653	120,699	10,496,352

3.13.4 Road Network Usage

The four routes carrying the most traffic, all link to Harare, and have AADT counts of more than 600 heavy vehicles (including buses). They are as follows:

- A1: Harare to Chirundu (Zambian border);
- A3: Harare to Mutare (border with Mozambique – linking to the Beira corridor);
- A4: Harare to Beit Bridge (South African border);
- A5: Harare to Bulawayo (towards the border with Botswana).

The usage of the RTRN in terms of vehicle kilometres travelled and equivalent standard axles is shown in Table 3.13.8 and Table 3.13.9.

Table 3.13.8: Zimbabwe Road Network Usage (VKT million)

Road Type	Annual vehicle kilometres travelled (VKT) by Vehicle Class (VKT million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	1263.69	121.74	138.41	42.62	198.61	1765.06
Unpaved	1.41	0.13	0.17	0.05	0.25	2.01
TOTAL	1265.09	121.87	138.58	42.67	198.86	1767.07

Table 3.13.9: Zimbabwe Road Network Usage (E80km million)

Road Type	Annual E80kms travelled by Vehicle Class (E80 km million)					
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Total
Paved	0.00	169.22	193.78	118.90	832.16	1314.06
Unpaved	0.00	0.19	0.23	0.14	1.05	1.61
TOTAL	0.00	169.40	194.01	119.04	833.21	1315.66

3.13.5 Cost Responsibility and Recovery Levels

Based on the funding requirements and the use of the network, Table 3.13.10: Zimbabwe Total Cost Responsibility, Cost Recovery and Cost Over- (Under) Recovery (US cent/km) shows the cost responsibility in US cent per km. It also shows the cost recovery based on the current charges payable by vehicles. Cost responsibility and cost recovery levels are also compared by presenting the total over or under recovery for fuel levies included and excluded, respectively.

As the charges payable differ between vehicles registered in Mozambique, Malawi and other countries, the cost recovery levels are also shown separately in Table 3.13.11.

The following will be noted:

- Regardless of the vehicle class, in all cases there is over-recovery.
- Regardless of the country of registration, the levels of recovery are the same for light vehicles. For buses and the other heavy vehicles, levels of over-recovery are the highest for Mozambique registered vehicles, followed by Malawi registered vehicles and then vehicles registered in other countries.
- There is not a significant difference in the over-recovery levels if the fuel levy is included or excluded, as the level of the fuel levy is relatively small.

Table 3.13.10: Zimbabwe Total Cost Responsibility, Cost Recovery and Cost Over- (Under) Recovery (US cent/km)

Vehicle Type	Cost Responsibility (US cent/km)	Cost Recovery (US cent/km)		Cost Over (Under) Recovery (US cent/km)	
		Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	0.13	5.32	4.99	5.18	4.85
BUS	0.83	19.75	18.55	18.92	17.72
2-3 HV	1.26	21.53	20.42	20.27	19.16
4-5 HV	1.97	24.19	22.63	22.21	20.65
6 & 6+ HV	2.61	24.51	22.62	21.90	20.01
Weighted Average	0.59	10.20	9.54	9.61	8.95

Table 3.13.11: Zimbabwe - Cost Recovery for different countries of Registration (US cent/km)

Vehicle Type	Mozambique Registered Vehicles		Malawi Registered Vehicles		Other Countries Registered Vehicles	
	Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy	Including Fuel Levy	Excluding Fuel Levy
LV	5.32	4.99	5.32	4.99	5.32	4.99
BUS	38.81	37.61	20.81	19.61	19.75	18.55
2-3 HV	38.72	37.61	27.72	26.61	21.53	20.42
4-5 HV	39.19	37.63	32.19	30.63	24.19	22.63
6 & 6+ HV	39.51	37.62	32.51	30.62	24.51	22.62
Weighted Average	14.91	14.26	11.85	11.19	10.20	9.54

3.13.6 Summary

The RTRN in Zimbabwe consists of almost 2850 km of which less than 2% is unpaved. Traffic levels on the RTRN are on average about 1670 vehicles per day. The annual funding requirements for routine and periodic maintenance on the RTRN amount to about US\$10.5 million.

4 Solutions for Collection of Charges

The purpose of this Chapter is to identify alternative approaches to collect the road user charges and to provide an evaluation of possible approaches. In the evaluation of the possible approaches, three aspects were considered, namely measurement methods, payment methods and collection methods.

4.1 General

Ideally, any system operated should be administratively simple and efficient. The method of payment should be generally accepted by users and must be user friendly. In addition, to retain confidence of users in the system, there is need for transparency and accountability to users.

The current practice is to collect transit charges from road users at the point of entry (i.e. the border post). In most cases, these charges are collected from operators of vehicles and channelled by customs officers through the Government consolidated Revenue Accounts which are administered by the Ministries of Finance. Consequently, the revenues collected from road users are typically not channelled directly to the provision and maintenance of the roads used.

Apart from the problems affecting the integrity of revenue collection, the operations of road hauliers are also adversely affected by:

- I. the driver having to carry large amounts of cash for the payment of road transit charges and other ancillary expenses. This exposes the driver to risks of possible loss of the cash imprest; and
- II. inflexibility of operations which arises from the fact that the driver is given a fixed amount of money to pay road transit charges for a specified journey. In the event, if the operator obtains cargo for a different destination whilst the truck is outside its home base, difficulties are encountered in sending additional cash to the driver.

One of the most striking features of the existing systems for collection of road transit charges is that road users are not consulted *inter-alia*, in the mode of payment, where the payment is to be made and on the use of the revenue collected. It is,

therefore, not surprising that road user/transit charges are generally disliked by users, primarily because the instruments for the collection of revenues are not simple, and robust. Instead of facilitating the movement of transit traffic there is widespread evidence that existing collection instruments cause unnecessary delays to especially heavy goods vehicles. For example, it is not uncommon for operators to turn up at the border posts, to be told that the mode of payment and currency has been changed. Invariably, most of the countries that levy road transit charges demand payment in United States Dollars cash. Traveller's cheques in the same currency are not accepted.

The lessons to be learnt from existing charging systems are that their design and implementation require the full involvement of governments on one hand and road users, associations of road hauliers, freight forwarders, and commercial banks on the other. Due to the regional nature of the application of road transit charges, it is essential that a common, if not a uniform approach, to methods of revenue collection be worked out.

4.2 Identification of possible approaches

In evaluating the possible approaches for the collection of RUC, three aspects were considered namely:

- Measurement methods;
- Payment methods; and
- Collection methods.

4.2.1 Measurement Methods

Countries such as Angola, Botswana, DR Congo, Lesotho, Mozambique Namibia, Swaziland and Tanzania levy a fixed fee per entry regardless of the distance travelled. Malawi, Zambia and Zimbabwe on the other hand base their charges per 100km travelled. South Africa does not levy an entry fee or transit charge.

Ideally road transit charges should be paid based on the weight of the vehicle and the distance travelled, as this system is more equitable than a fixed fee per entry.

The measurement of distances can be performed by means of the following methods:

- The use of **waybills** or a **manual** system whereby the destination of vehicles can be taken from the waybill, and based on the point of entry, vehicles can then be charged according to the distance between these points. Zambia and Zimbabwe make use of a schedule (refer to Table 3.12.3 and Table 3.13.3) stating the routes or origins and destinations, and for each route a specific charge is being levied. The advantage of this system is its simplicity. The disadvantage is that it becomes difficult to prove the distance in the case of light vehicles and buses (as they do not require waybills).
- The use of a **weight distance charges** system whereby vehicles are charged according to their laden weight or Gross Vehicle Mass (GVM) and their distance travelled. This is possibly the most equitable charge, as there will not be any cross-subsidisation *between* and *within* vehicle classes. Weight distance charges can be collected by means of various technological systems which are discussed below.

4.2.1.1 Hub odometer

This option entails the installation of a hub odometer to monitor the actual kilometres travelled by the vehicle. The working of this system is shown in Figure 4.2.1.

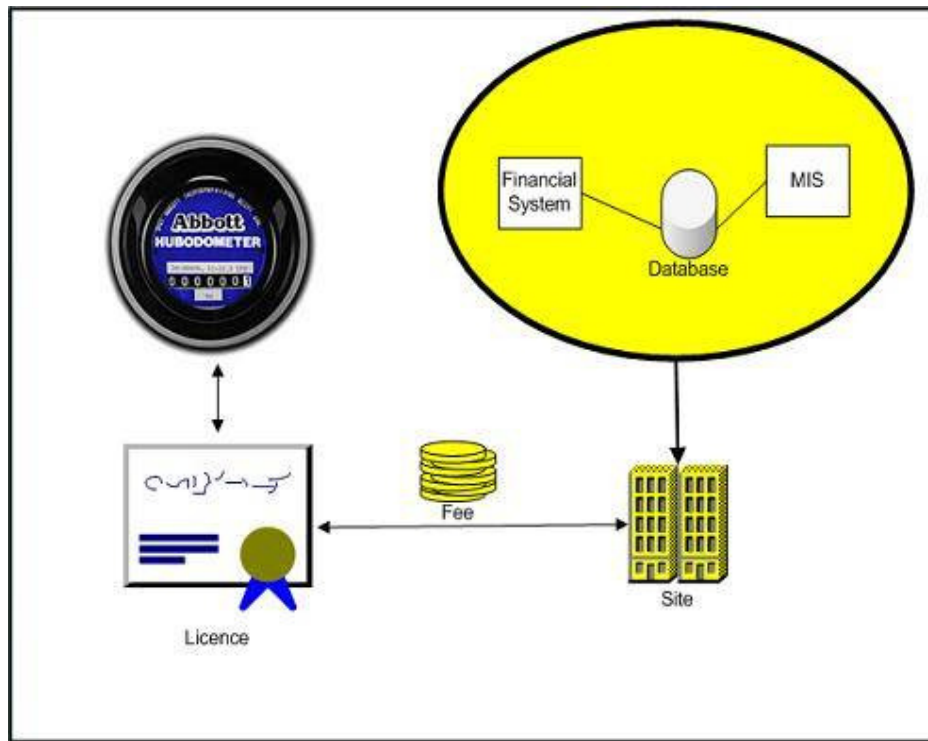


Figure 4.2.1: Working of the hub-odometer

The disadvantage of this system is that tampering with the hub-odometer is fairly easy, and therefore the system is not very reliable. However, the technology used in the hub odometers changed dramatically during the past decade. The new hub odometers are increasingly tamper-resistant. The digital hub-odometers are difficult or impossible to reset. Some vehicles also have mileage data recorded in the engine computers that can be checked to verify the hub-odometer readings. The use of hub-odometers has been discontinued in other countries such as Australia due to complex enforcement requirements which makes the system more conducive to evasion.

4.2.1.2 Transponders / Route tracers / Electronic Number Plates

In this solution, a transponder / route tracer is installed in the vehicle. Signposts are erected along the road network. When the vehicle passes a signpost, the event is registered in the transponder / route tracer. The information is later communicated to a database, where the distance travelled can be calculated. The working of this system is shown in Figure 4.2.2.

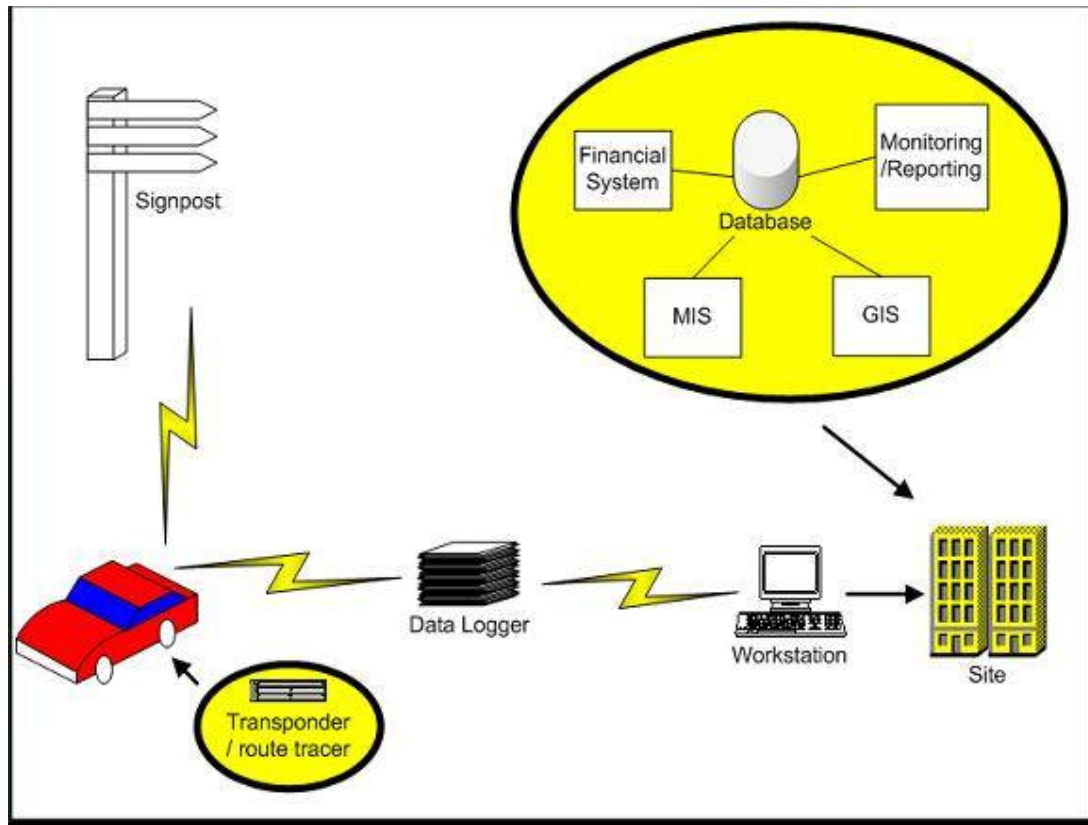


Figure 4.2.2: Working of Transponders / Route tracers / Electronic Number Plates

The disadvantage of this system is that the implementation of this system is fairly complex and time consuming, as signposts need to be erected along the road network of every country as well as various sites with data loggers. An update of technology would require the update, servicing and replacement of each hardware and/or software item. The reliability of this system is a matter of concern, as it is influenced by the following:

- If there are no signposts in a specific area, there will be no reference to any trip undertaken in that area.
- The vehicle must pass within a specific distance from the signpost for the transponder / route tracer to register the event.
- The vehicle must also be within a certain distance of the data logger to enable the downloading / transmission of the events registered by the transponder / route tracer.

4.2.1.3 GPS-based with GSM/RF technology

GPS-based technology consists of a unit installed in a vehicle. This unit uses satellites to determine its coordinates. By utilising a GIS component within the unit, the distance travelled is calculated and this distance is communicated to the central database. The working of this system is shown in Figure 4.2.3.

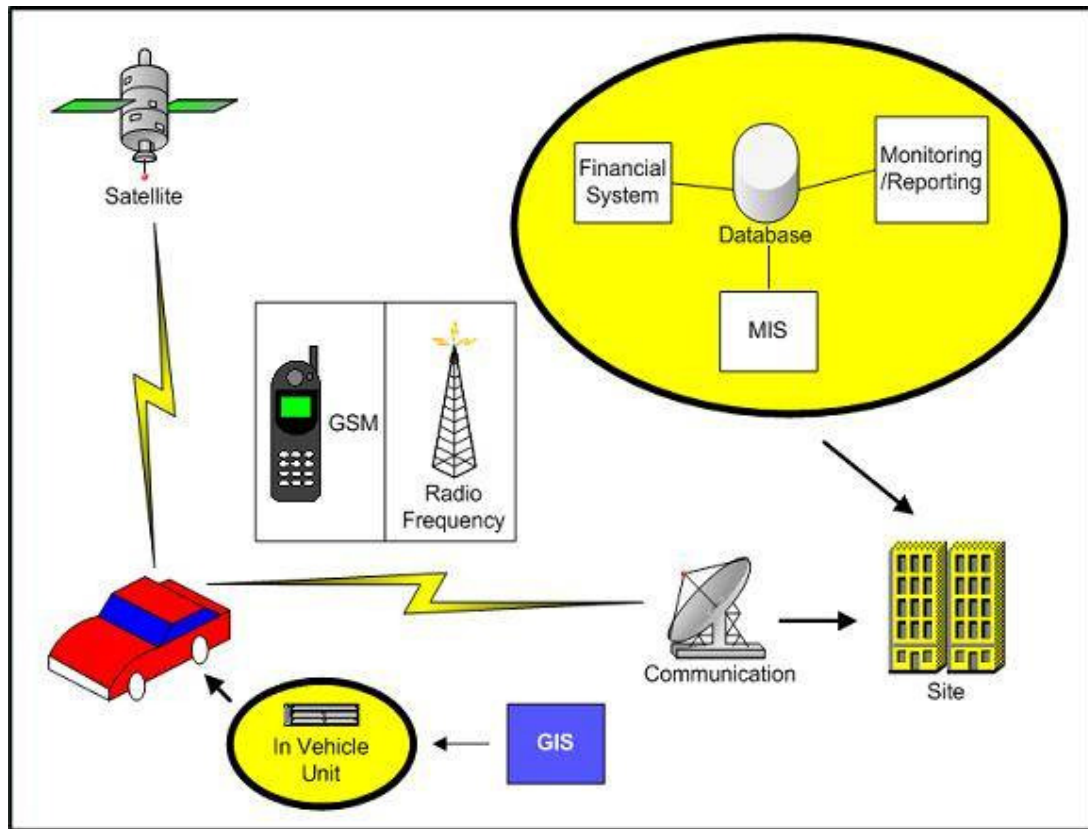


Figure 4.2.3: Working of GPS-based with GSM/RF technology

Compared to the other two systems, the advantages outweigh the disadvantages.

The technology is current and used in similar systems such as tracking as well as call and dispatch systems.

GPS system accuracy, signal loss and reacquisition, and initial signal acquisition are factors affecting the reliability of this system. Signal loss and increased time to acquire a signal can be caused by obstructions like mountainous terrain, rain and clouds, and tall buildings and trees.

4.2.2 Payment Methods

Possible solutions for the payment of transit charges include the following:

- The use of **cash**. The long-term use of this method is not recommended as it is open to misuse due to possible revenue leakage and due to security reasons.
- The use of **debit cards** or **credit cards**: Facilities are needed to accept debit/credit cards via point of sale (POS) terminals and manual imprinting. Manual imprinting in the case of credit cards poses the risk of credit card fraud, and due to the remote location of some border posts, POS terminals are not always in place.
- The use of **coupons**. This is a user friendly system, which operated satisfactorily and efficiently between Malawi, Mozambique and Zimbabwe from 1984 to 1992. In Zimbabwe and Malawi the coupon system was administered by private sector organisations; namely the Confederation of Zimbabwe Industries (CZI) and the Malawi Chamber of Commerce. Unlike the system of cash payments, the coupon system is relatively secure in that possibilities for evasion and pilferage are minimised. It should be stressed that the demise of the coupon system for the payment of road transit charges has been primarily due to political, rather than economic considerations.

4.2.3 Collection Methods

Possible solutions that can be used in the collection of road transit charges:

- Collection of transit charges by a selected **Government Department**. This system of collecting revenues is not user friendly and robust.
- Collection of transit charges by a designated **Commercial Bank** in each country which will issue coupons to transit transport operators. These commercial banks would then remit the collected revenue to an account designated by the receiving government.
- **Outsourcing** the function to a private company, as happened in the case of Namibia (refer to Table 4.2.1: Namibia Case Study for the Namibia case study).

Table 4.2.1: Namibia Case Study

The Namibian Cross-Border Charges System (CBCS) was implemented in December 2000 by means of a Public Private Partnership (PPP) type of contract. In keeping with its core functions, the Namibian Road Fund Administration's involvement in the system is currently confined to policy matters, strategic planning, setting of tariffs and audits. Various performance indicators are included in the JV contract and are used for the determination of penalties and performance bonuses from the second year of operation. The CBCS was initially implemented at four of the largest border posts in the country and subsequently extended to an additional seven border posts. These border posts operations are serviced by nine payment offices that are operated by a total of six contractors employing a total of 38 persons. During the three-year period of its operation to November 2003, approximately 470,000 permits had been issued. 64% of the revenue collected represented net revenue to the Namibian Road Fund Administration and the remaining 36% represented the JV operating revenue. The initial contract price made provision for the recovery of the JV's cost of the capital investment made in developing the system, which will become the property of the Namibian Road Fund Administration on contract expiry. The functionality of the CBCS entails the issuing, cancellation and tracking of cross border permits and includes the calculation of the charge payable by a foreign operator for the Namibian leg of a cross-border journey. The system has been designed to operate in tandem with the ASYCUDA system used by Customs and Excise to collect taxes and duties. The CBCS calculates the cross-border charges and records the journey, while all billing (including pre-payments) and financial record-keeping take place in ASYCUDA. The system contains a central database where the data collected at each border post is captured once a day. The database also generates financial and management reports for the use of the JV and the Namibian Road Fund Administration. Daily, weekly and monthly backups are also implemented and maintained by the JV while there is a back-up manual system for use in the case of emergencies such as system or power failures. The CBCS makes provision for 17 vehicle classes.

4.3 Evaluation of approaches

4.3.1.1 General

It is quite clear from the foregoing, that the measurement method, payment method and collection method will have to be agreed in close consultation between government on one hand and road users and other interested parties on the other.

4.3.1.2 Measurement Methods

For the technological system, a GPS-based with GSM/RF technology would be ideal. The management of the entire system is however of utmost importance. Due to the cost and complexity of such a system and the need for strict enforcement it is not clear if such a system can be implemented for all continental SADC member states in the foreseeable future.

Therefore it is recommended that a simple system be implemented whereby distances are based on the destinations stated on the waybills for heavy goods vehicles. For light vehicles and passenger vehicles, the distance should be based on the stated destination of the vehicle operator. A schedule with origins and destinations for each possible route with corresponding fee or charge levels should then be used to calculate the appropriate charges.

Under the proposed system each country will largely be responsible for implementing the system in its own territory and charges should be adjusted annually to take account of a variety of factors such as changes in road use and currency fluctuations.

4.3.1.3 Payment Methods

Ultimately, the use of coupons would appear to offer, on balance, especially for commercial vehicle operators, a viable system. However, because of differing circumstances in the various SADC countries, it would be inappropriate to prescribe such a system in blanket manner. Consequently, it is recommended that various forms of payment should be initially adopted.

Payment of transit charges should take place at the border post or in advance at designated agencies which individual countries may elect to appoint and which could

be made responsible for devising their own verification and law enforcement procedures and programmes.

4.3.1.4 Collection methods

It is recommended that Governments should give consideration to contracting the management and administration of collecting revenues for transit charges to the private sector. National Association of Transporters, or other private sector agents, could be allowed, subject to specific agreements with governments, to charge a commission for services rendered. In order for this system to function efficiently without default, it is advisable that each government enters into a contract with the institution/organisation.

4.4 Summary

Although a country by country approach is proposed at this stage, it is recommended that, in the longer term, efforts should be co-ordinated towards a more harmonised method of collecting transit charges based on the experiences gained from the use of the various collection systems operated in the region.

5 Summary and Discussion of Results

The purpose of this section is to present a summary of the results of the study in terms of the following:

- **Comparison** between the **RTRN** defined during the country visits and the RTRN, as defined by SADC (refer to Table 4.4.1).
- The **extent of the RTRN**, usage of the RTRN in VKT and the RTRN financing needs (refer to Table 4.4.2).
- The **cost responsibility** per country and per vehicle class and the average for all countries (refer to Table 4.4.3).
- The **cost recovery** per country and per vehicle class and the average for all countries in the case of fuel levies **included** (refer to Table 4.4.4) and fuel levies **excluded** (refer to Table 4.4.6).
- The **cost over- or under-recovery** per country and per vehicle class and the average for all countries in the case of fuel levies **included** (refer to Table 4.4.5) and fuel levies **excluded** (refer to Table 4.4.7).

Table 4.4.1: Comparison of the RTRN (SADC and Country Visits)

Country	Extent of the RTRN (km)			
	Country Visits	SADC 1998	Difference	% Difference
Angola	7,096.00	8,215.00	(1,119.00)	-13.6%
Botswana	2,831.70	2,847.00	(15.30)	-0.5%
DR Congo*	8,370.00	8,370.00	-	0.0%
Lesotho	1,075.09	942.00	133.09	14.1%
Malawi	1,400.00	1,800.00	(400.00)	-22.2%
Mozambique	5,692.00	5,407.00	285.00	5.3%
Namibia	3,748.54	4,580.00	(831.46)	-18.2%
South Africa	10,458.22	7,470.00	2,988.22	40.0%
Swaziland	440.97	326.00	114.97	35.3%
Tanzania	6,866.33	7,384.00	(517.67)	-7.0%
Zambia	2,968.00	5,355.00	(2,387.00)	-44.6%
Zimbabwe	2,848.00	3,232.00	(384.00)	-11.9%
TOTAL	53,794.86	55,928.00	(2,133.15)	-3.8%

Note: The RTRN for the DR Congo was redefined in 2001, and the RTRN as per the country visit corresponds to that defined in 2001.

From Table 4.4.1, it should be noted that the most significant difference between the SADC RTRN and the RTRN defined during the country visits pertains to Zambia where the difference is 44.6% (lower than the RTRN originally defined by SADC).

The second highest difference is for South Africa where the RTRN is about 40% higher than the RTRN originally defined by SADC.

Table 4.4.2: RTRN Summary per Country

Country	RTRN Paved (km)	RTRN Unpaved (km)	RTRN Total (km)	RTRN Usage (VKT million per annum)	RTRN Financing Needs (US\$ per annum)
Angola	2,510.00	4,586.00	7,096.00	446.25	44,116,799
Botswana	2,831.70	-	2,831.70	842.14	10,844,479
DR Congo	1,473.00	6,897.00	8,370.00	340.04	40,682,138
Lesotho	716.09	359.00	1,075.09	412.59	4,069,730
Malawi	1,296.00	104.00	1,400.00	680.34	10,381,504
Mozambique	4,299.00	1,393.00	5,692.00	2,214.77	44,463,760
Namibia	3,419.21	329.33	3,748.54	1,017.49	14,533,565
South Africa	10,458.22	-	10,458.22	38,939.66	193,983,187
Swaziland	440.97	-	440.97	401.23	1,433,240
Tanzania	3,790.19	3,076.14	6,866.33	2,387.14	25,041,237
Zambia	2,874.00	94.00	2,968.00	1,340.71	10,882,843
Zimbabwe	2,793.00	55.00	2,848.00	1,767.07	10,496,352
TOTAL	36,901.38	16,893.47	53,794.86	50,789.42	410,928,833

From Table 4.4.2, the following is evident:

- **Extent of the total RTRN:** South Africa followed by the DR Congo has the largest RTRN. Swaziland has the smallest RTRN while Lesotho has the second smallest RTRN.
- **Unpaved roads forming part of the RTRN:** The DR Congo has the highest proportion of unpaved roads forming part of the RTRN. Only Botswana, South Africa and Swaziland have no unpaved roads as part of their RTRN.
- **Usage of the RTRN in terms of VKT:** The usage of the road network is the highest in South Africa while it is the lowest in the DR Congo. It is interesting to note that the VKT of the DR Congo is slightly lower than that of Swaziland but the extent of the RTRN in the DR Congo exceeds that of Swaziland by a factor of almost 20. The same applies to Angola in a slightly lower degree.
- **Financing Needs:** South Africa has the highest total financing needs, and Swaziland has the lowest total financing needs which can be expected due to the respective sizes of South Africa's and Swaziland's RTRN. The total

annual requirement to finance the routine and periodic maintenance of the RTRN of all the SADC continental member states amounts to almost US\$ 411 million.

Table 4.4.3: Summary of Cost Responsibility Levels per Country and per Vehicle Type (US cent per km)

Country	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Weighted Average
Angola	1.57	9.61	15.06	22.91	29.88	9.89
Botswana	0.21	1.78	2.34	4.02	5.62	1.29
DR Congo	6.21	30.13	55.28	75.80	91.96	11.96
Lesotho	0.32	1.90	3.11	4.59	5.86	0.99
Malawi	0.47	3.57	4.75	8.11	11.32	1.53
Mozambique	0.44	3.10	4.52	7.21	9.67	2.01
Namibia	0.38	2.76	3.80	6.34	8.73	1.43
South Africa	0.16	0.94	1.50	2.26	2.92	0.50
Swaziland	0.13	0.89	1.29	2.08	2.80	0.36
Tanzania	0.30	1.81	2.82	4.32	5.67	1.05
Zambia	0.12	0.93	1.28	2.13	2.93	0.81
Zimbabwe	0.13	0.83	1.26	1.97	2.61	0.59
Weighted Average	0.24	1.56	2.61	3.27	4.27	0.81

Regarding Table 4.4.3, the following should be noted:

- As can be expected, the cost responsibility levels increase, as the size of the vehicle class increases. In other words, light vehicles have lower cost responsibility levels than heavy vehicles.
- The average cost responsibility level for all vehicles and all countries amounts to 0.81 US cents per km.
- DR Congo followed by Angola has the highest cost responsibility levels due to the extensive extent of the RTRN and the low traffic levels in those two countries.
- Although South Africa has by far the highest financing needs in terms of the routine and periodic maintenance, South Africa has the second lowest cost responsibility levels due to the high traffic levels.

Table 4.4.4: Summary of Cost Recovery per Country and per Vehicle Type (US cent per km) (including fuel levy)

Country	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Weighted Average
Angola	0.20	0.38	0.38	0.37	0.38	0.28
Botswana	0.33	1.21	1.33	2.66	4.33	0.94
DR Congo	6.85	14.24	16.61	20.88	24.02	8.05
Lesotho	0.61	2.81	2.61	3.73	4.44	1.37
Malawi	0.71	7.99	9.84	17.59	18.14	2.97
Mozambique	1.45	4.33	5.86	7.59	8.82	2.95
Namibia	1.81	6.26	5.89	9.51	11.65	3.12
South Africa	2.86	8.19	8.01	11.15	13.34	4.22
Swaziland	2.54	5.51	5.31	6.28	6.99	3.05
Tanzania	1.12	9.00	18.78	19.90	20.73	5.45
Zambia	2.17	10.96	11.70	17.05	18.03	6.80
Zimbabwe*	5.32	19.75	21.53	24.19	24.51	10.20
Weighted Average	2.71	8.24	9.15	11.35	14.00	4.37

Note: * The cost recovery levels pertaining to Zimbabwe are based on vehicles registered in other countries (i.e. other than Mozambique or Malawi).

From Table 4.4.4, the following can be derived:

- Zimbabwe has the highest cost recovery levels while Angola has the lowest cost recovery levels.
- For all countries the cost recovery levels increase as the vehicle size increases except in the case of Angola where the 2-3 Axle heavy vehicles are charged the same as their heavier counterparts.

Table 4.4.5: Summary of Cost Over (Under) Recovery per Country and per Vehicle Type (US cent per km) (including fuel levy)

Country	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Weighted Average
Angola	(1.37)	(9.24)	(14.68)	(22.54)	(29.51)	(9.61)
Botswana	0.12	(0.57)	(1.01)	(1.35)	(1.29)	(0.35)
DR Congo	0.64	(15.89)	(38.67)	(54.91)	(67.94)	(3.91)
Lesotho	0.29	0.90	(0.50)	(0.86)	(1.42)	0.39
Malawi	0.24	4.43	5.10	9.48	6.82	1.44

Country	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Weighted Average
Mozambique	1.01	1.23	1.34	0.38	(0.85)	0.94
Namibia	1.42	3.50	2.08	3.16	2.92	1.69
South Africa	2.70	7.25	6.51	8.89	10.42	3.73
Swaziland	2.41	4.62	4.03	4.21	4.19	2.69
Tanzania	0.82	7.19	15.96	15.58	15.06	4.40
Zambia	2.05	10.02	10.42	14.92	15.10	6.00
Zimbabwe*	5.18	18.92	20.27	22.21	21.90	9.61
Weighted Average	2.47	6.68	6.55	8.07	9.73	3.56

Note: * The cost recovery levels pertaining to Zimbabwe are based on vehicles registered in other countries (i.e. other than Mozambique or Malawi).

It is evident from Table 4.4.5 that:

- Over-recovery of costs applies to all countries except Angola, Botswana and DR Congo.
- The highest average cost **under**-recovery applies to Angola while the highest cost **over**-recovery applies to Zimbabwe.
- On average, 3.56 US cent per km is over-recovered.

Table 4.4.6: Summary of Cost Recovery per Country and per Vehicle Type (US cent per km) (excluding fuel levy)

Country	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Weighted Average
Angola	0.20	0.38	0.38	0.37	0.38	0.28
Botswana	0.32	1.17	1.30	2.62	4.27	0.91
DR Congo	3.04	2.84	6.06	6.06	6.06	3.28
Lesotho	0.08	0.23	0.22	0.37	0.37	0.13
Malawi	-	6.00	8.00	15.00	15.00	1.96
Mozambique	0.07	0.17	2.01	2.18	2.27	0.56
Namibia	0.40	1.13	1.14	2.84	3.58	0.80
South Africa	0.80	1.74	2.04	2.76	3.17	1.11
Swaziland	1.83	2.93	2.93	2.93	2.93	2.00
Tanzania	0.29	6.00	16.00	16.00	16.00	3.97
Zambia	1.18	7.36	8.37	12.37	12.36	4.52
Zimbabwe*	4.99	18.55	20.42	22.63	22.62	9.54
Weighted Average	0.89	3.56	4.89	3.65	5.58	1.61

Note: * The cost recovery levels pertaining to Zimbabwe are based on vehicles registered in other countries (i.e. other than Mozambique or Malawi).

From Table 4.4.6, the following can be derived:

- As in the case with Table 4.4.4, Zimbabwe has by far the highest cost recovery. Unlike the case in Table 4.4.4, Lesotho has the lowest cost recovery levels.
- The average recovery level compared to Table 4.4.4 is lower by a factor of about 2.7.

Table 4.4.7: Summary of Cost Over (Under) Recovery per Country and per Vehicle Type (US cent per km) (excluding fuel levy)

Country	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	Weighted Average
Angola	(1.37)	(9.24)	(14.68)	(22.54)	(29.51)	(9.61)
Botswana	0.11	(0.61)	(1.04)	(1.40)	(1.34)	(0.37)
DR Congo	(3.17)	(27.29)	(49.21)	(69.73)	(85.90)	(8.68)
Lesotho	(0.25)	(1.68)	(2.89)	(4.21)	(5.49)	(0.86)
Malawi	(0.47)	2.43	3.25	6.89	3.68	0.43
Mozambique	(0.37)	(2.93)	(2.51)	(5.02)	(7.40)	(1.45)
Namibia	0.01	(1.63)	(2.66)	(3.50)	(5.16)	(0.63)
South Africa	0.64	0.80	0.54	0.50	0.26	0.62
Swaziland	1.70	2.04	1.64	0.85	0.12	1.64
Tanzania	(0.01)	4.19	13.18	11.68	10.33	2.92
Zambia	1.06	6.42	7.09	10.24	9.43	3.71
Zimbabwe*	4.85	17.72	19.16	20.65	20.01	8.95
Weighted Average	0.65	2.00	2.29	0.38	1.31	0.81

Note: * The cost recovery levels pertaining to Zimbabwe are based on vehicles registered in other countries (i.e. other than Mozambique or Malawi).

From Table 4.4.7, the following can be derived:

- Compared to Table 4.4.5, under-recovery applies not only to Angola, Botswana and DR Congo but also to Lesotho, Mozambique and Namibia.
- The average over-recovery is about 38% higher than that compared to Table 4.4.5.

Table 4.4.8 shows a comparison of the compulsory access charges payable at selected border posts.

Table 4.4.8: Comparison of Compulsory Access Charges payable at Border Posts

Entering	Charge (US\$)					Weighted Average
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV	
South Africa	0.00	0.00	0.00	0.00	0.00	0.00
Lesotho	0.81	2.42	2.42	4.03	4.03	1.39
Malawi	0.00	6.00	8.00	15.00	15.00	1.96
Swaziland	8.06	12.90	12.90	12.90	12.90	8.82
Tanzania	20.00	6.00	16.00	16.00	16.00	18.02
Angola	14.53	26.83	26.83	26.83	26.83	19.60
Mozambique	0.00	0.00	100.00	100.00	100.00	23.62
Botswana	9.19	33.09	36.76	71.69	121.32	25.85
Namibia	14.97	42.74	43.47	106.39	136.34	29.91
Zambia	35.07	75.13	76.13	80.13	80.13	50.50
Zimbabwe	142.00	365.94	367.81	370.00	370.00	206.32
DR Congo	255.00	265.00	565.00	565.00	565.00	280.00
Weighted Average	8.54	33.98	37.20	17.95	46.49	13.57

Note: * The compulsory access charge levels pertaining to Zimbabwe are based on vehicles registered in other countries (i.e. other than Mozambique or Malawi).

Regarding Table 4.4.8, the following should be noted:

- The charge levels per vehicle class pertain to the charges payable when entering the relevant country.
- The compulsory access charge includes all charges which are payable upon entry to a specific country such as International Transit Charges/Fees/Tolls, Foreign Vehicle Permit Fees, Cross-Border Charges, Road Transport Permit Fees, Entry Card Fees, Insurance Fees, Container Fees, Fumigation Fees, Toll Fees, Road Tollgate Fees¹, Carbon Taxes and Surveillance Fees.
- Other charges incurred when travelling in a country such as tolls and fuel levies or fuel taxes are excluded from the analysis.
- The compulsory access charge payable is the minimum payable for each country and vehicle type. E.g. where charges are payable per 100km, it was assumed that a vehicle only travels 100km within the country of destination. The same applies to charges payable in advance for a specific minimum time

¹ Toll Fees and Road Toll Gate Fees are fees payable at the border post, and are not the same as fees levied on toll roads in South Africa and Mozambique.

period (i.e. per month such as in the case of foreign vehicle permit fees for light vehicles in Tanzania).

- Countries are listed according to increasing magnitude of the weighted average compulsory access charge payable.

From Table 4.4.8, the following can be derived:

- There are significant disparities between the charges levied at the border post when entering a specific country.
- Charges payable when entering the DR Congo are the highest, followed by Zimbabwe. Lesotho has the lowest charges followed by Malawi.
- South Africa is the only country where no compulsory access charges are levied from vehicle operators at the border. Toll fees are however levied if transit vehicles travel on toll roads. When entering Malawi no charges are payable for light vehicles. Similarly, when entering Mozambique no charges are payable for light vehicles and buses.

The overall conclusion can be made that there is still severe discrepancies between different countries in terms of charges levied at the point of entry into a country.

6 Conclusions and Recommendations

The purpose of this Chapter is to present the key conclusions from the study as well as recommendations.

6.1 Conclusions

The key conclusions that can be made from this study are presented under the following headings:

- Current Charges levied from road users
- Extent of the RTRN
- Cost Responsibility and Cost Recovery Levels
- Comparison of results from previous study

6.1.1 Current Charges levied from road users

The types of charges that are currently levied from road users vary considerably. All charges were categorised for a specific charge category as follows:

- **Compulsory access fees** refer to all charges that are payable at the border posts upon entering a specific country.
- **Domestic Fees** include annual vehicle licence fees.
- **Other Fees** include tolls payable on toll roads, fuel levies and fuel taxes. Tolls are currently only payable in South Africa and Mozambique. Fuel levies were included in the cases where there is a dedicated fuel levy. Fuel taxes are used as a proxy for countries who do not have a dedicated fuel levy in order to arrive at comparable results.

The table below presents a list of the charges payable by road users in the various countries.

RUC Category	Charge Type	Country											
		Ang	Bot	DRC	Les	Mal	Moz	Nam	SA	Swaz	Tan	Zam	Zim
Compulsory Access Fee	Transit Charges/Fees/Tolls	X				X	X			X	X	X	X
	Foreign Vehicle Permit Fees										X		
	Cross-Border Charges							X					
	Road Transport Permit Fees		X										
	Entry Card Fees			X									
	Insurance Fees			X									

RUC Category	Charge Type	Country											
		Ang	Bot	DRC	Les	Mal	Moz	Nam	SA	Swaz	Tan	Zam	Zim
	Container Fees			X									
	Fumigation Fees			X									
	Toll Fees**			X									
	Road Tollgate Fees**				X								
	Carbon Taxes											X	X
	Surveillance Fees			X									
Domestic Fee	Annual Vehicle Licence Fees	Reviewed but not considered as only applicable to domestic vehicles											
Other Fees	Fuel Levies		X		X	X	X	X			X	X	X
	Fuel Taxes*			X					X	X			
	Tolls						X		X				

Note: * Proxy for levy. Angola does not have a dedicated fuel levy, and as the fuel price is subsidised, fuel taxes are also not applicable in Angola.

** Toll fees and road toll gate fees are levied at the border post when entering the respective country and are therefore separate from fees charged on toll roads.

Charges that were considered to determine the cost recovery from road users include the Compulsory Access Fees and the Other Fees. It was assumed that all traffic on a particular RTRN of a specific country is transit traffic or foreign traffic, and therefore Domestic Fees that are levied from domestic vehicle operators such as annual vehicle licence fees were excluded.

6.1.2 Extent of the RTRN

The extent of the RTRN was confirmed with country officials. The table below shows a comparison between the RTRN defined during the country visits and the RTRN as defined by SADC in 1998.

Country	Extent of the RTRN (km)			
	Country Visits	SADC 1998	Difference	% Difference
Angola	7,096.00	8,215.00	(1,119.00)	-13.6%
Botswana	2,831.70	2,847.00	(15.30)	-0.5%
DR Congo*	8,370.00	8,370.00	-	0.0%
Lesotho	1,075.09	942.00	133.09	14.1%
Malawi	1,400.00	1,800.00	(400.00)	-22.2%
Mozambique	5,692.00	5,407.00	285.00	5.3%
Namibia	3,748.54	4,580.00	(831.46)	-18.2%
South Africa	10,458.22	7,470.00	2,988.22	40.0%
Swaziland	440.97	326.00	114.97	35.3%
Tanzania	6,866.33	7,384.00	(517.67)	-7.0%
Zambia	2,968.00	5,355.00	(2,387.00)	-44.6%
Zimbabwe	2,848.00	3,232.00	(384.00)	-11.9%
TOTAL	53,794.86	55,928.00	(2,133.15)	-3.8%

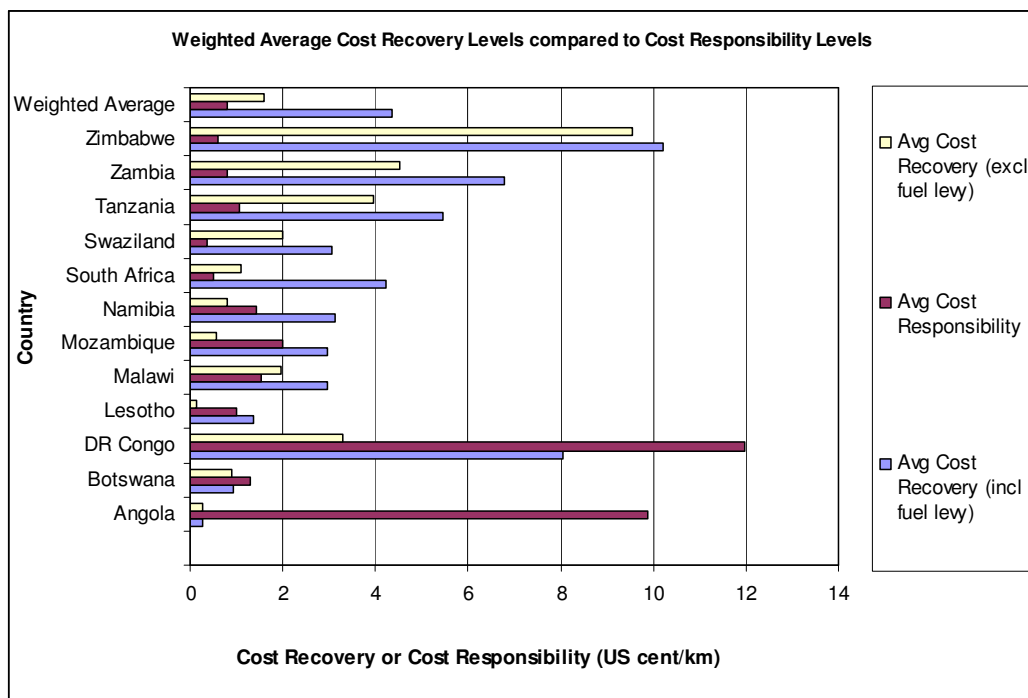
Note: The RTRN for the DR Congo was redefined in 2001, and the RTRN as per the country visit corresponds to that defined in 2001.

The most significant difference between the SADC RTRN and the RTRN defined during the country visits pertains to Zambia where the difference is 44.6% (lower than the RTRN originally defined by SADC). The second highest difference is for South Africa where the RTRN is about 40% higher than the RTRN originally defined by SADC.

6.1.3 Cost Responsibility and Cost Recovery Levels

Cost recovery levels exceed cost responsibility levels in most cases. In this regard it should however be noted that not all charges levied from road users are used for maintenance funding.

The weighted average cost recovery levels compared to the cost responsibility levels are shown in the figure below, and it will be noted that the cost recovery levels exceed the cost responsibility levels in all cases except Angola, Botswana and DR Congo in the case where fuel levies are included. If fuel levies are excluded, cost under recovery does not only occur in Angola, Botswana and DR Congo but also in Lesotho, Mozambique and Namibia.



6.1.4 Comparison of results from previous study

The table below shows the proposed road transit charges of the 1997 study entitled “Proposed System of Harmonised Road Transit Charges for the SADC Region”.

1997 Proposed Road Transit charges (US\$/100km)					
Country	LV	Bus	2 - 3 HV	4 - 5 HV	6 & 6+ HV
Botswana	0.60	3.40	4.20	8.80	12.20
Malawi	1.00	5.00	8.40	13.45	20.80
Lesotho	1.35	5.40	7.90	15.55	20.50
Mozambique	1.50	7.10	10.50	21.10	27.90
Namibia	1.60	9.25	12.00	23.00	31.90
South Africa	0.35	1.55	2.15	4.25	7.55
Swaziland	0.55	2.65	3.65	7.55	8.80
Tanzania	0.90	3.90	5.70	11.40	15.05
Zambia	0.90	4.00	5.90	11.90	15.70
Zimbabwe	0.75	2.90	4.20	8.25	10.90
Average	0.95	4.50	6.45	12.50	17.00

If the above proposed road transit charges are compared with the proposed road transit charges of **this** study which are to be based on the cost responsibility levels determined during this study, and which are shown below it will be noted that the 1997 charges are considerably higher in most cases.

Country	Current Study Proposed Road Transit charges (US\$/100km)				
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV
Angola	1.57	9.61	15.06	22.91	29.88
Botswana	0.21	1.78	2.34	4.02	5.62
DR Congo	6.21	30.13	55.28	75.80	91.96
Lesotho	0.32	1.90	3.11	4.59	5.86
Malawi	0.47	3.57	4.75	8.11	11.32
Mozambique	0.44	3.10	4.52	7.21	9.67
Namibia	0.38	2.76	3.80	6.34	8.73
South Africa	0.16	0.94	1.50	2.26	2.92
Swaziland	0.13	0.89	1.29	2.08	2.80
Tanzania	0.30	1.81	2.82	4.32	5.67
Zambia	0.12	0.93	1.28	2.13	2.93
Zimbabwe	0.13	0.83	1.26	1.97	2.61
Average	0.24	1.56	2.61	3.27	4.27

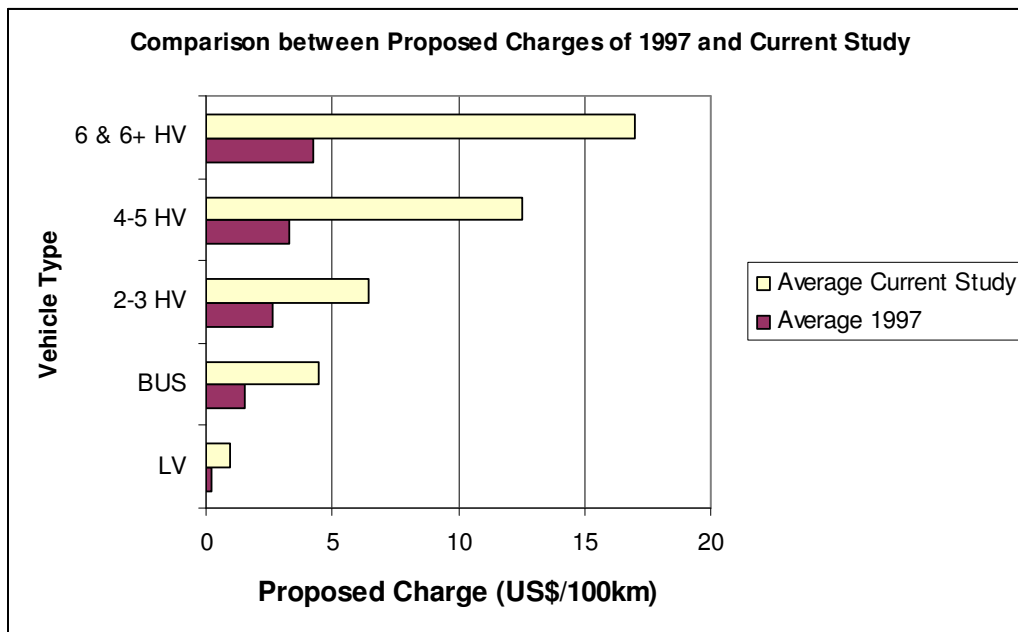
The reasons for the higher charge levels in 1997 can be attributed to the following:

- The 1997 Study included rehabilitation costs to be recovered from road users. In this current study it was however assumed that the entire road network is in

a maintainable condition. If rehabilitation costs were to be included, the results per country would not have been comparable especially due to the fact that of the vast differences in terms of rehabilitation requirements or backlog maintenance to be carried out on especially the networks of Angola and DR Congo which were previously excluded from the analysis.

- Traffic levels have increased significantly since 1997 which in turn resulted in a drastic increase in VKT and E80km on the respective networks. Since, the allocation of costs and the resultant cost responsibility is made on the basis of VKT and E80km, it can be expected that the charge levels will decrease.

The figure below shows a comparison between the **average** charge levels determined in 1997 and the proposed charge levels determined as part of this study.



6.2 Recommendations

Recommendations are presented under the following headings:

- Revision of the RTRN
- Consolidation of types of charge payable at the border posts
- Proposed Transit Charges
- Solutions for collection of Charges

6.2.1 Revision of the RTRN

Based on the significant differences in the extent of the RTRN especially in South Africa and Zambia, it is proposed to review the RTRN.

It should also be noted that the RTRN in the DR Congo only consists of links in the southern area and not in the northern part of the country which impacts on the overall network connectivity.

6.2.2 Consolidation of types of charge payable at the border posts

There is a significant number of charges payable upon entry to the various border posts. There is a need to consolidate some of these charges.

6.2.3 Proposed Transit Charges

It is proposed that the transit charges are being levied based on distance travelled instead of a fixed entry fee.

The proposed charges in US\$ per 100km which are based on the cost responsibility levels are shown in the table below.

Country	Proposed Road Transit charges (US\$/100km)				
	LV	BUS	2-3 HV	4-5 HV	6 & 6+ HV
Angola	1.57	9.61	15.06	22.91	29.88
Botswana	0.21	1.78	2.34	4.02	5.62
DR Congo	6.21	30.13	55.28	75.80	91.96
Lesotho	0.32	1.90	3.11	4.59	5.86
Malawi	0.47	3.57	4.75	8.11	11.32
Mozambique	0.44	3.10	4.52	7.21	9.67
Namibia	0.38	2.76	3.80	6.34	8.73
South Africa	0.16	0.94	1.50	2.26	2.92
Swaziland	0.13	0.89	1.29	2.08	2.80
Tanzania	0.30	1.81	2.82	4.32	5.67
Zambia	0.12	0.93	1.28	2.13	2.93
Zimbabwe	0.13	0.83	1.26	1.97	2.61
Average	0.24	1.56	2.61	3.27	4.27

6.2.4 Solutions for collection of Charges

Measurement Methods

Due to the complexity of a technological system and the need for strict enforcement it is not clear if a technological system can be implemented for all continental SADC member states in the foreseeable future.

Therefore it is recommended that a simple system be implemented whereby distances are based on the destinations stated on the waybills for heavy goods vehicles. For light vehicles and passenger vehicles, the distance should be based on the stated destination of the vehicle operator. A schedule with origins and destinations for each possible route with corresponding fee or charge levels should then be used to calculate the appropriate charges.

Payment Methods

The use of coupons would appear to offer the most viable system. However, because of differing circumstances in the various SADC countries, it would be inappropriate to prescribe such a system in blanket manner. Consequently, it is recommended that various forms of payment should be initially adopted.

Collection methods

It is recommended that Governments should give consideration to contracting the management and administration of collecting revenues for transit charges to the private sector as happened in the case in Namibia. National Associations of Transporters or other private sector agents could be allowed to charge a commission for services rendered. In order for this system to function efficiently without default, it is advisable that each government enters into a contract with the institution/organisation.

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Annexure A: Study ToR

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Annexure B: RTRN Maps



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**Annexure C: Draft Memorandum of Understanding on
Harmonization of Road User Charges**

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Annexure D: Regional Implementation Plan
