Southern Africa Transport Network:

Comparative Transit Transport Cost Analysis

September 2001

For REDSO/ESA's Strategic Objective # 623-002-01:
Increased Use of Critical Information
by USAID and Other Decision-Makers in the Region

Rural and Agricultural Incomes with a Sustainable Environment (RAISE)
IQC No. PCE-I-00-99-00001-00, Task Order 805:
Regional Trade Analytical Agenda
Implemented by TechnoServe-Kenya and ARD, Inc.

Submitted to:
USAID/REDSO/ESA
PO Box 30261
Nairobi, Kenya

Submitted by:
CSIR Transportek
PO Box 395,
Pretoria 0001, South Africa

for the ARD-RAISE Consortium
1601 N. Kent Street, Suite 800
Arlington, VA 22209 U.S.A.
www.ard-raise.com

ARD - RAISE

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by

Peter Freeman (Ph.D.)
Ig Schutte
Oliver Page
Amanda Meyer
Clifford Naude

For

CSIR Transportek
PO Box 395,
Pretoria 0001, South Africa

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Regional Trade Analytical Agenda (RTAA)
Implemented by TechnoServe-Kenya and ARD, Inc.

ARD-RAISE Consortium
1601 N. Kent Street., Suite 800
Arlington, VA 22209, USA
Tel: 703-807-5700, Fax: 703-807-0889
gkerr@ardinc.com

The ARD-RAISE Consortium:
ARD, Inc., Cargill Technical Services, Associates for International Resources and Development
CARANA Corporation, A.P. Gross & Company, International Programs Consortium, Land O' Lakes,
Purdue University, and TechnoServe.

TABLE OF CONTENTS

APPENDICES

ACKNOWLEDGEMENTS

CSIR Transportek wishes to acknowledge all persons and organizations that made this study possible.

A special word of thanks goes to USAID for funding this study and ARD, Inc. for facilitating the execution of the study in liaison with TechnoServe Inc. A special word of thanks also goes to participants at the workshop in Harare who assisted in providing data and general guidance, and especially Nzuki Mwania (Regional Transport Policy Advisor, TechnoServe Inc.) for providing valuable technical guidance. Inputs received from representatives of REDSO, RCSA as well as UNCTAD are greatly appreciated. Comments received from senior officials from COMESA (Dr Jerome Ntibarekerwa and Mr Gilbert Maeti) and SADC/SATCC (Mr. Eric Msolomba, Mr. Sakhe Silo, Dr. Charles Kunaka and Ms. Tracy Zinanga) also proved to be invaluable.

CSIR Transportek also wishes to acknowledge the contribution of Les Sampson at the workshop in Harare, and Bo Giersing in sharing valuable insights in the course of the study.

Finally, a special word of appreciation goes to all stakeholders who shared their insight and knowledge regarding costs, issues and constraints impacting on transport cost in the region with us during interviews. Without these contributions, this study would not have been possible.

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transport Officials
ACIS	Advanced Cargo Information System
AFC	Airport Facilitation Committees
AfDB	African Development Bank
AFR	Africa Bureau
AFR/SD/PSGE	Africa Bureau's Productive Sector Growth and Environment Division in the Office of Sustainable Development
ANOVA	Analysis of Variance
ASANRA	Association of Southern African National Roads Agencies
ASYCUDA	UNCTAD's Automated System for Customs Data and Management
ATM	Air Traffic Management Project
ATNS	Air Transport Navigation Services
BBR	Beit Bridge Bulawayo Railway Ltd
BIS	ACIS Backbone Information System
BOT	Build-Operate-Transfer
CCL	COMESA Carrier License
CMG	Corridor Management Groups
CNS	Communications, Navigation, Surveillance Project
CFM	*Portos e Caminhos de Ferro de Mozambique*
COMESA	Common Market for Eastern and Southern Africa
COMESA/SADC CD	COMESA/SADC Customs Document
CPC	Corridor Planning Committee
CSIR	Council for Scientific and Industrial Research (South Africa)
DR	Distance Related
DRC	Democratic Republic of Congo
dwt	deadweight ton
EAC	East African Community
EC	European Commission
ECA	Economic Commission for Africa
ESA	Eastern and Southern Africa
EUROTRACE	A computer system for the collection and analysis of Federation of Clearing and Forwarding Agents of Southern Africa
FESARTA	Federation of East and Southern African Road Transport Associations
FHWA	US Federal Highway Administration
FRRFA	Federation of Regional Road Freight Associations
FTA	Free Trade Area
GDP	Gross Domestic Product
GVM	Gross Vehicle Mass
HIV	Human Immuno-deficiency Virus
HFX	High Frequency X-border Land Mobile Radio Communications System
HRTC	Harmonized Transit Charges

IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IDZ	Industrial Development Zone
IGAD	Intergovernmental Authority on Development
IGO	Intergovernmental Organization
IMO.	International Maritime Organization
JIT	Just-In-Time
MICAP	Micro Action Plans
MLP	Model Legislative Provision
MOU	Memorandum of Understanding
MT	Metric Ton
MWG	Multidisciplinary Working Group
NAI	New Africa Initiative
NDR	Non-Distance Related
NGO	Nongovernmental organization
NIPW	National Protocol Implementation Workshops
NOCZIM	National Oil Company of Zimbabwe
N-PICT	National Protocol Implementation Team
PPP	Public-Private Partnership
PAAS	Policy Analysis Assistance to SATCC
RAPID	Regional Activity to Promote Integration through Dialogue and Policy Implementation
RCBG	Regional Customs Guarantee Scheme
RCSA	Regional Center for Southern Africa
RCTD	Road Customs Transit Document
REC	Regional Economic Community
REDSO/ESA	Regional Economic Development Services Office for Eastern and Southern Africa (of USAID)
REVOCA	Region Vehicle Overload Control Association
RHCTSS	Regional Harmonization of Customs and Trade Statistics Systems
RMF	Regional Management Forum
RMG	Route Management Group
RMI	Regional Market Integration
RSA	Republic of South Africa
RSIS	SADC Railway Rolling Stock Information System
RTAA	Regional Trade Analytical Agenda
SAAFF	South African Association of Freight Forwarders
SACU	Southern African Customs Union
SADC	Southern African Development Community
SARA	Southern African Railways Association
SADC	Southern Africa Development Community
SAECS	Southern Africa/Europe Conference Sailings
SATCC	Southern Africa Transport and Communications Commission
SATCC-TU	SATCC Technical Unit
SATN	Southern Africa Transport Network

SCOM	Regional Subsectoral Committees (of SATCC)
SOW	Scope of Work
SRDC	Subregional Development Center
STEP	SADC Transport Efficiency Project
T^2	Technology Transfer
TAZARA	Tanzania-Zambia Railways Authority
TKCC	Trans Kalahari Corridor Committee
TTCA	Transit Transport Coordination Authority
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
USAID	United States Agency for International Development
VSAT	Very Small Aperture Terminal
WBCG	Walvis Bay Corridor Group

EXECUTIVE SUMMARY

Introduction

The need for this study arose from concerns about the prevailing high levels of transport costs in the COMESA/SADC regions, particularly at a time when it was intended to introduce Free Trade Areas (FTAs). Questions of relative efficiency and competitiveness were increasingly raised by both operators and investors alike. High transport costs caused by system inefficiencies or bottlenecks were clearly impacting negatively not only on international competitiveness but also jeopardizing the success of planned regional economic integration.

With this in mind, the Common Market for Eastern and Southern Africa (COMESA), with the agreement of the Southern Africa Development Community (SADC), requested the United Stated Agency for International Development's Regional Economic Development Services Offices (USAID/REDSO) for support to undertake and disseminate the results of a study covering eight southern African countries with major transport corridors. It was agreed that while duplication of earlier studies should be avoided, it would be important to ascertain why previous recommendations had not been implemented or why the implementation process appeared to be very slow.

The scope of work for the study articulated three objectives:

a) to analyze comparative transit costs along different corridors by the road, rail, sea, inland water, pipeline and aviation modes;
b) to critically analyze the causes of slow implementation of the various recommendations contained in research and workshop reports that can lower transit costs if executed; and
c) to propose modalities of hastening implementation of the recommendations and hence lowering transport costs in the region.

The approach followed comprised an analysis of each selected transport corridor by mode, a review of past initiatives to reduce transport cost in the region, an analysis based on questionnaire responses and interviews as to the reasons for slow progress and proposed strategies for accelerating implementation or identifying new ideas to improve the situation.

According to studies undertaken for the United Nations Conference on Trade and Development (UNCTAD), the adverse impact of transport costs on trade efficiency are real and of serious concern. In Africa, 11.5 percent of the total value of imports relates to transport costs. In North America, the equivalent percentage is 6.7 percent and in Asia 7.2 percent. Within Africa, the percentage for Eastern Africa is 23.6 percent, while for Southern Africa the figure is 12.7 percent. On the export side, many of the countries of Southern Africa spend 20 percent of their earnings on transportation and related expenses, with Malawi spending as much as 55.5 percent! It is clear, therefore, that reductions in transport costs can significantly improve the region's competitiveness. This is emphasized by the increasing trend of globalization enabling buyers to electronically seek the lowest prices internationally which, over time, puts downward pressure on commodity prices and forces competitors to look at

ways to reduce the costs in their value chains. Reducing transport costs is an important component of this process.

The consultants working on the USAID Regional Activity to Promote Integration through Dialogue and Policy Implementation (RAPID) program are of the view that "halving transport costs would stimulate an increase in trade by five times", presumably because the goods conveyed would become substantially more competitive on world markets. This report examines what is feasible and what are the main constraints to lowering transport costs that can be removed or minimized by a proper integrated regional strategy.

Southern and Eastern Africa are located unfavorably relative to the world's major markets. The distances to these markets are a given and cannot be changed. This is even more true for the landlocked inland African countries, although there may be instances where missing inland transport links could be constructed and routes slightly shortened.

The other factor beyond the control of the strategists is the robustness and size of the region's economies. In international terms the region contributes only a small fraction of the world economy and translates into low volumes of goods on some of the routes. This immediately increases transport costs because significant economies of scale cannot be achieved.

The implication of this is that the main savings are to be made in improving the efficiency of the regional transport sector and in removing bottlenecks wherever possible. Key factors in this regard relate to the efficiency of operations, competition between routes and modes, the condition of the infrastructure, lack of capital investment, poor management and lack of capacity and skills.

Over the last few decades, these problems have been compounded by regional conflicts, the shrinkage and even collapse of some countries' economies as well as natural disasters — all leading to a deterrent effect on international investment. This cycle is only likely to be broken by a concerted effort by the region to present an integrated and harmonized approach which is sustainable over the longer term.

Methodology

This study involves all major modes of transport and covers eight main transport corridors and eight southern African countries, four of which are also members of COMESA. The main corridors also have a number of sub corridors comprising 22 in all. On eight of these sub corridors, shippers have a choice between two modes of transport and on one corridor a choice of three modes. This means that some 32 corridors/mode combinations were investigated.

Cost data were obtained from a number of sources for these combinations and divided into two main groupings:

- non-distance related (NDR) costs comprising certain border post charges, port charges and transshipment costs; and

- distance related (DR) costs consisting of haulage costs, toll fees, distance related border charges and various other costs such as insurance premiums and facilitation fees.

A 12m container with a payload of 20 tons was taken as a standard for comparison purposes between the various corridors and modes. However, for rail and sea transport, bulk goods movements were also examined and all cost types were benchmarked against the best performance in the region and, in some instances, against international charges. Costs are expressed in January 2001 US dollars. Three formats were used for presenting cost information, namely, cost per container per corridor, cost per container per kilometer and actual costs relative to average values (in order to identify "outliers"). Average transit times and trip speeds are also analyzed.

Factors contributing to high costs are then discussed, based on the findings of the quantitative analysis, supplemented by information from the country stakeholder interview results.

The next step was to record and analyze initiatives by both COMESA and South African Transport and Communications Commission (SATCC) to reduce transport costs to date and to examine the progress in this direction. The transport-related structures under these organizations are also discussed.

A questionnaire was then distributed to various stakeholders in each mode to elicit a response on the weaknesses and strengths of past initiatives aimed at improving transport sector efficiency. These findings are analyzed statistically and, together with information from the stakeholder interviews, it proved possible to quantify and rank the constraints identified. Inputs from a stakeholder workshop in Harare were also considered in this process. The constraints were analyzed and ranked by mode and then consolidated to determine the key areas on which strategy should focus.

The strategies developed are divided into two categories, i.e., generic, and mode specific. Pivotal to the success of this methodology is the quantification of the problem, and this study provides the first comprehensive attempt to rank the reasons hindering the lowering of transport costs and to recommend a way forward based on a solid foundation of evidence. Many of the issues or deficiencies identified up front in the Scope of Works (SOWs) were in fact components of the larger bottlenecks. The key to the success of this project was to identify these real problem areas and recommend a way to overcome them.

Strategies to Overcome Generic Constraints

Public-Private Partnerships (PPPs)

By far the most significant factor to emerge from the analysis is the need perceived by nearly all respondents for greater involvement of the private sector at all levels. Four modes ranked this strategy as number one and one mode number two. A major reason for involving the private sector is to ensure that the user or consumer is involved in the system design and in the service level provided. The private sector attracts skilled experts and project managers capable

of assisting the public sector, and can take over some functions currently handled by government on an outsourced or agency basis. Ideally, the public and private sectors should work in a partnership relationship with the former focussing on the regulatory aspects, the setting of charges and the policy direction as well as interstate coordination matters.

Public private partnerships can be achieved in at least three forms:

a) Project specific: e.g., Build, operate and transfer infrastructure projects where the private sector not only runs the facility, but provides capital and takes the commercial risk. The role of the public sector is to set and monitor standards and agree fair user charges. Such projects can only be realized where volumes are sufficient to ensure a financial return for the investors. A variation is to run a concession (say, the operation of weighbridges on a tendered basis).
b) Corridor specific: e.g., Partnerships to develop and promote a corridor (Walvis Bay Corridor) or to remove bottlenecks and achieve efficient freight flows (Trans Kalahari Corridor Planning Committee).
c) Generic partnership: e.g., Representation at regional forums by the private sector should be increased radically and the private sector should be treated as an equal partner as it has much to contribute, including resources.

While it is recognized that there are many excellent people working in the public service in the region, it is also true that because of limited capacity, skills levels and resources, productivity it is often lower than desired. Responsibility for pursuing a course of action should preferably not be given to committees, but to resourced project managers with clear business plans and deadlines. Action-orientated proposals are also more likely to be looked on favorably by funding agencies. Pilot projects can show the benefits of cooperation and be replicated elsewhere.

Cooperation and Commitment of Member States

Member states in Southern and Eastern Africa associate with either the SADC or COMESA regional organizations, or with both. In the case of SADC, there are now 14 member states while COMESA has 20 members. These organizations have logical structures at a number of different levels to effect regional integration and coordination. In addition, some states are members of the Southern African Customs Union (SACU). Clearly however, with so many groupings, the risk of duplication of activities is real, but the major problem is the time taken to achieve agreement from the governments of so many states. This is especially the case when some of the states are experiencing economic instability or are involved with military conflict. In addition, the cost of attendance of the many meetings necessary in such structures is of concern to some of the less well-off countries.

One solution to this may be to devise ways of simplifying both the system (including the number of organizations) and the structures. This, of course, would be a long-term goal and some steps have already been taken towards rationalization by these organizations. In the meantime, it is suggested that progress in implementation should be made incrementally after in-principle agreement to a policy has been obtained. In other words, where a member state or states are ready to go ahead with implementation, they should do so even if other states are

holding back for whatever reason. The success of "pilot" projects can be a very strong incentive for other states to want to replicate the benefits. It is suggested that the Trans Kalahari Corridor Planning Committee may be a good example of a successful pilot.

Cooperation is one thing, commitment is another. A number of respondents have alluded to national priorities taking precedence over regional, especially with regard to airlines and the promotion of certain routes or the securing of certain revenues. The implication is that despite the signed protocol, the evidence is that at "official" level, there is sometimes non-compliance. This is a more intransigent problem since any penalty for non-compliance is in practice unlikely to be enforceable. The best approach would appear to be tougher discussions on such matters at the Council of Ministers level, backed up by good feedback from supporting structures with regard to examples of non-compliance and through performance indicators. It is here too that the private sector can play a strong lobbying role.

A variation on this theme is the fear of dominance by South Africa that has by far the largest economy in the region and, the other side of this coin, whereby South Africa sometimes does not communicate a need to review issues agreed with other member states when circumstances change. Examples of the former would be purchase of signaling systems incompatible with Spoornet systems and, of the latter, a decision by South Africa to investigate the reduction of payloads for road transport.

Establishment of Monitoring Mechanisms

This strategy is considered important because by introducing monitoring systems, there will be an effective performance measuring system to ascertain the rate of progress in removing bottlenecks. Key indicators of such systems could be summarized and would be a tool for the Council of Ministers and others to identify where and why progress is not being made.

Clearly, there would be a need to determine what should be monitored and how indicators would have to be used by the member states in a consistent manner and would involve data collection of the same type. Typical indices could be:

- changes in transport costs,
- decreases in travel times,
- progress on milestones set, and
- progress on tasks executed.

Such indices could be generic, corridor specific, modal specific or even project specific. The monitoring function should preferably not be assigned to a new structure, but to existing organizations or substructures. Should there be insufficient capacity in the public sector to handle this function internally, then it could typically be contracted to a management consultancy or other specialized firm. In any case, the private sector should be involved in the system design. Stakeholders from both the public and private sectors need to agree on what is to be monitored, the frequency of monitoring and the deliverables resulting from the monitoring process.

Information Sharing and Effective Communication

The above discussion dovetails neatly into the need for a shared information system. USAID RAPID have assisted SATCC to set up a website in Johannesburg because of the limited bandwidth availability in Maputo and because the SATCC function is to move to Gaborone shortly. A web-based database would be open to all and should be multifunctional. It could contain, inter alia:

- transport legislation (regional and national),
- minutes of meetings (secretariats, transport forums, etc.),
- protocols,
- contact names and addresses,
- reports and studies,
- ongoing project reports and evaluations,
- tender notices and announcements, and
- transport statistics.

It is envisaged that the database would be developed incrementally and updated continuously. Its architecture should also be compatible with other relevant databases set up in the region. The database would help to avoid duplication of effort, assist decision-making and assist financing organizations to see what other work has been undertaken in each area. An example of a multifunctional web-based transport information database is Iport, developed by the CSIR for the South African transport industry.

Improved information sharing will lead to more effective communication and it is recommended that the database be populated and accessible by SATCC, COMESA, SACU and newer structures such as the Association of Southern African National Road Agencies (ASANRA) and Federation of East and Southern Africa Road Transport Associations (FESARTA).

Training and Education

The training and education needs of those involved in transport (both in the public and private sectors) are diverse. Interviews revealed particular concern for the lack of expertise in some government departments and lack of training in customer responsiveness. There is also sometimes a lack of training in management and an inability to communicate and translate decisions into action “on the ground”.

There are always initiatives of a capacity building nature ongoing at any particular time, but specific attention perhaps needs to be given to encourage a regional training approach in transport by assessing minimum skills requirements in the short, medium and long term. The private sector can assist government departments and agencies on a contractual basis.

The plethora of consultants working in the region has given rise to differing standards of delivery and project execution, while the level of skills transfer is sometimes poor. Skills

transfer milestones could be built into most projects and progress in this area monitored by an independent party.

Establishment and Strengthening of Transport Forums

The strengthening of transport forums has to some extent already been covered under bringing in the private sector more fully and establishing management tools, performance indicators and databases. It is important that the secretariat functions are efficient and the private sector can be asked to give support where necessary. Clearly, wider representation can only be sustained when a forum is perceived to be effective and making tangible progress.

Pooling of Resources

A primary opportunity for pooling resources is in the civil aviation industry that is very capital intensive. In this sector, for example, a regional airline, standardized aircraft and parts, common software and shared training programs will also assist in achieving economies of scale, but at the expense of symbolic national carrier status. Opportunities for pooling lie in all transport subsectors.

Promotion of the Region as an Attractive Market

Interviews with stakeholders, in some instances, revealed a lack of a regional approach in promoting the region. The point of departure is that perceptions are of high transport costs and, in some cases, unreliability and long lead times on certain routes. It is suggested that to counter this, an active promotional campaign should accompany successes in the removal of bottlenecks to international users of the various corridors and services.

Establishment of Dedicated Funding Sources

This is a particularly big issue in the road sector. The point is that to sustain an economic primary road system, a steady financial stream must be achieved. This can be done through introducing national dedicated funds and, ultimately, a regional dedicated fund could be established as agreed in the protocol.

Drafting of Transport Policy and Legislation

This intervention was ranked relatively low but a number of respondents mentioned it. In short, it is the need to harmonize existing legislation and to ensure that each member state has a national transport policy and that this accords with regional transport policy. In some states, there is still a need to amend legislation to bring it in line with the regionally agreed protocols.

Government Involvement

This is an area where there was some divergence between private and public sector. Essentially, the former believes that government should play a more facilitative role and not become involved in operational issues. This factor is less developed in public sector responses where perhaps there is an element of defensiveness or feeling of “loss of control”. Neither

group of respondents, however, ranked this constraint highly, although it is partly reflected under the need for public-private partnerships. Some distrust is evident because privatization or restructuring is often associated with job losses rather than efficiency and is normally opposed vigorously by organized labor.

Strategies to Overcome Generic Complaints

Road

It is recommended that FESARTA and a few selected representatives of individual carriers play a much stronger role in the sector. They can make very strong contributions towards corridor planning committees and route management groups that can help the public sector resolve bottlenecks at border posts and ports. Similarly ASANRA and the Road SCOM should be strengthened with road transport sector participants who can give a user perspective on poor sections of road, axle load regulations, transit charges and road fund levies. Financial assistance may have to be given to provide for the travel costs of persons from individual firms, but associations should be able to bear their own costs from members' contributions.

There are many reasons for delays at border posts, but the most common is incorrect or incomplete documentation (up to 20 percent of delays). In addition, border opening hours, poor management and processing delays are significant. The investigations by the RAPID team are expected to be very important in defining the way ahead on this issue.

Rail

Virtually all regional railway systems are already undergoing some form of restructuring with involvement of the private sector. In all cases the intention is that the state will retain ownership of the infrastructure and the private sector will be granted an operating concession. The public sector has an important role in ensuring there is fair competition between road and rail and an independent regional transport regulator could assist in this regard. Involvement of the private sector will have to be supported by capital investment, but the first priority must be to drastically improve the management of rail operations and coordination to reduce for example standing time of wagons. Railway inter-networking arrangements can be certainly improved and inter-connectivity is a problem in two areas where regional conflict caused the service to be suspended (i.e., the Sena Line (Beira-Malawi) and Lobito-Democratic Republic of the Congo [DRC]). Freight tracking and management of railway wagon movements can be critical in reducing delay times.

Inland Water and Sea Transport

The costs of inland water transport are likely to remain high because of the low volumes using this mode. Operations can be concessioned however to maximize efficiency for such strategic services. Port charges in East Africa, but Dar es Salaam in particular, need special attention and the same approach to the problem as was followed in the Trans Kalahari Corridor can be used, whereby a public private partnership is entered into to systematically address the constraints pertaining to the corridor with buy-in from the top officials in the relevant government departments. Many ports will benefit in due course from re-structuring initiatives

currently in progress to bring in the private sector. At present, customers are trading off risk of delays against costs on certain corridors. Container crane productivity is an area deserving serious attention.

Pipelines

Pipeline companies can share information with each other to improve operational efficiency. A transport regulator would ensure charges are not excessive. In some instances governments should discourage potentially hazardous liquids from being carried on other modes for long distances where a pipeline exists.

Aviation

Many air transport routes in the region are not economically sustainable and are therefore unprofitable. The region must begin to consolidate its collective position, moving from a plethora of small national airlines unable to fully exploit economies of scale to a few larger airlines able to operate profitably on a commercial basis, with appropriate levels of regulation. This is the most difficult area since airlines are associated with national sovereignty and the matter is sensitive. If faster progress is to be made towards air transport liberalization based on the Yammoussokro Decision then independent private sector advisors with an international reputation could be brought in to balance national and carrier vested interests. It is recognized that recent events impacting on the airline industry following the September 11 terrorist attacks in the USA will complicate and possibly retard progress in this area.

Concluding Remarks

This study reveals clearly the reasons for limited progress in the region in the past and shows that some factors cannot easily be reversed in the short to medium term. However, there is much that could and should be done and the key to success is unanimous — that private sector participation should be radically improved.

Many of the other constraints can be unlocked by this first step, but the subsequent focus should be on eliminating border post delays, prioritizing needed infrastructure upgrading, introducing information and monitoring systems and promoting the improvements to the transport system vigorously to the rest of the world as they happen.

CHAPTER 1.
INTRODUCTION

1.1 Background

One of the most important factors to enhance rapid development in developing countries is for them to become part of the universal drive towards globalization. For the countries of southern Africa, this requires the extension of international trade, including international trade amongst the Common Market for Eastern and Southern Africa (COMESA) and the Southern Africa Development Community (SADC) member countries themselves. The perceived high transport costs that prevail in these regions however hamper optimal trade development within the countries and also between COMESA/SADC countries and the rest of the world. High transport costs in the region have therefore been hailed as a major issue. High costs, caused by system inefficiencies, impact negatively on the international competitiveness of the region and jeopardize regional economic integration. They also counter the objectives of free trade areas (FTAs) that have been planned or are being implemented in the COMESA and SADC economic blocs. Distances to major markets add to this problem. The region is located unfavorably relative to the world's major markets. The distances to these markets are, however, a given and cannot be changed; this is even more true for the landlocked inland African countries. The robustness and size of the region's economies are further factors beyond the control of the region's strategists. In international terms, the region contributes only a small fraction of the world economy, which translates into low volumes of goods on some of the routes. This immediately increases transport costs because significant economies of scale cannot be achieved.

There are various examples of the existence of high costs. According to studies undertaken for UNCTAD, the adverse impact of transport costs on trade efficiency is real and of serious concern. In Africa, 11.5 percent of the total value of imports relates to transport costs. In North America, the equivalent percentage is 6.7 percent and in Asia 7.2 percent. Within Africa, the percentage for Eastern Africa is 23.6 percent, and for Southern Africa the figure is 12.7 percent. On the export side, many Southern African countries spend 20 percent of their earnings on transportation-related expenses, with Malawi spending as much as 55.5 percent.

For these reasons, the USAID's Regional Economic Development Services Office for Eastern and Southern Africa (USAID/REDSO/ESA) and Africa Bureau's Productive Sector Growth and Environment Division in the Office of Sustainable Development (AFR/SD/PSGE), have been supporting a Regional Trade Analytical Agenda (RTAA). The RTAA deals with evolving trade, transport and agricultural policies on regional integration, agricultural production, productivity and food security in Eastern and Southern Africa. Various research and dissemination activities, aimed at developing regional policies supporting the development of regional and international trade, agricultural production and food security in Eastern and Southern Africa (ESA, have consequently been undertaken since 1995. The RTAA works with regional institutions like the Common Market for Eastern and Southern Africa (COMESA), Southern Africa Development Community (SADC) (including the Southern Africa Transport and Communications Commission [SATCC]), the East African Community (EAC), Intergovernmental Authority on Development (IGAD), and the Transit

Transport Coordination Authority (TTCA). The RTAA also involves relevant government policymakers and other stakeholders in its research and dissemination initiatives.

1.2 Macroeconomic Overview of Study Area

1.2.1 Regional Overview

The transport and economic dimensions of any country or region are inextricably linked, the one cannot be seen in isolation from the other. It is therefore important to first focus on the macroeconomic characteristics of the study area to provide the necessary context for evaluating the transport sector.

From Tables 1.1 and 1.2 it can be seen that the study area comprises eight countries with a population of over 132 million and covering a large area of 5.6 million square kilometers. Total GDP is of the order of US $395 billion and GDP per capita is US $2983 on average. However, the distribution of population and resources is uneven, dependent on rainfall, soil fertility, location of minerals and levels of skills and capacity. These factors are also reflected in the composition of the GDP.

Table 1.1: Selected Macroeconomic Indicators

Country	Indicator			
	GDP (1999 US$ bill)	GDP per capita (1999 US$)	GDP real growth rate (%)	Inflation rate (consumer prices) (%)
Botswana	5.7	3 900	6.5	7.7
Malawi	9.4	940	4.2	45.0
Mozambique	18.7	1 000	10.0	4.0
Namibia	7.1	4 300	3.0	8.5
South Africa	296.1	6 900	0.6	5.5
Tanzania	23.3	550	4.0	8.8
Zambia	8.5	880	1.5	27.4
Zimbabwe	26.5	2 400	0.0	59.0
Total	395.3	2 983	-	-

Source: The World Factbook 2000

Table 1.2: Additional Macroeconomic Indicators

Country	Indicator				
	Population (mill)	Area (km^2)	GDP Composition (% of total GDP)		
			Agriculture	Industry	Services
Botswana	1.6	600 370	4	46	50
Malawi	10.4	118 480	37	29	34
Mozambique	19.1	801 590	34	18	48
Namibia	1.8	825 418	12	30	58
South Africa	43.4	1 219 912	5	35	60
Tanzania	35.3	945 087	49	17	34
Zambia	9.6	752 614	21	31	48
Zimbabwe	11.3	390 580	28	32	40
Total	132.5	5 654 051	-	-	-

Source: The World Factbook 2000

Tables 1.3 to 1.6, detailing the extent of the various transport networks, show a similar distribution pattern. Obviously, some transport corridors are advantaged in that economic activity in the subregion is high, resulting in high volumes of goods to be conveyed, whereas other corridors have lower volumes which may have to be conveyed over longer distances and which may be prone to seasonal flooding or other natural impacts.

Table 1.3: Comparison of Road Networks, 2000

Country	Length of Network (km)			Road Density (km/km^2)		
	Paved	Unpaved	Total	Paved	Unpaved	Total
Botswana	4 343	14 139	18 482	0.007	0.024	0.031
Malawi	5 254	23 146	28 400	0.044	0.195	0.241
Mozambique	5 685	24 715	30 400	0.007	0.031	0.038
Namibia	5 250	63 258	68 508	0.006	0.077	0.083
South Africa	63 027	471 104	534 131	0.052	0.386	0.438
Tanzania	3 704	84 496	88 200	0.004	0.089	0.093
Zambia	Na	Na	66 781	Na	Na	0.089
Zimbabwe	8 692	9 646	18 338	0.022	0.025	0.047
Total	95 955	690 504	786 459	0.017	0.122	0.139

Source: The World Factbook 2000
Note: *Na = Not available*

Table 1.4: Comparison of Rail Networks, 2000

Country	Length of Network (km)			Rail Density (km/km^2)
	1.067m gauge	Other*	Total	
Botswana	971	0	971	0.0016
Malawi	789	0	789	0.0067
Mozambique	2 988	143	3 131	0.0039
Namibia	2 382	0	2 382	0.0029
South Africa	20 995	436	21 431	0.0176
Tanzania	969	2 600	3 569	0.0038
Zambia	2 164	0	2 164	0.0029
Zimbabwe	2 759	0	2 759	0.0071
Total	34 017	3 179	37 196	0.0066
* Note: Relevant to the Tanzania rail network				

Source: The World Factbook 2000

Table 1.5: Air Transport and Pipelines, 2000

Country	Airports (number of paved runways over 3 047m)	Pipelines (km)
Botswana	0	0
Malawi	1	0
Mozambique	1	595
Namibia	2	0
South Africa	9	3 001
Tanzania	2	982
Zambia	1	1 724
Zimbabwe	3	212
Total	19	6 514

Source: The World Factbook 2000

Table 1.6: Waterways and Marine Transport, 2000

Country	Waterways (km)	Ports and Harbors (number)
Botswana	0	0
Malawi	144	5
Mozambique	3 750	6
Namibia	0	2
South Africa	0	7
Tanzania	494	11
Zambia	2 250	1
Zimbabwe	0	0
Total	6 638	32

Source: The World Factbook 2000

1.2.2 Country Overview

A brief overview of the economy of each country in the study area is also given to assist in providing the reader with an appropriate background. These overviews are sourced from the World Factbook 2000[1].

Botswana
Agriculture still provides a livelihood for more than 80% of the population but supplies only about 50% of food needs and accounts for only 3% of GDP. Subsistence farming and cattle raising predominate. The sector is plagued by erratic rainfall and poor soils. Diamond mining and tourism also are important to the economy. Substantial mineral deposits were found in the 1970s and the mining sector grew from 25% of GDP in 1980 to 38% in 1998. Unemployment is officially 21% but unofficial estimates place it closer to 40%. The Orapa 2000 project, which will double the capacity of the country's main diamond mine, will be finished in early 2000. This will be the main force behind continued economic expansion.

Malawi
Landlocked Malawi ranks among the world's least developed countries. The economy is predominately agricultural, with about 90% of the population living in rural areas. Agriculture accounts for 37% of GDP and 85% of export revenues. The economy depends on substantial inflows of economic assistance from the IMF, the World Bank, and individual donor nations. The government faces strong challenges, e.g., to spur exports, to improve educational and health facilities, to face up to environmental problems of deforestation and erosion, and to deal with the rapidly growing problem of HIV/AIDS.

Mozambique
Before the peace accord of October 1992, Mozambique's economy was devastated by a protracted civil war and socialist mismanagement. In 1994, it ranked as one of the poorest countries in the world. Since then, Mozambique has undertaken a series of economic reforms. Almost all aspects of the economy have been liberalized to some extent. More than 900 state enterprises have been privatized. Pending are tax and much- needed commercial code reform,

[1] CIA, The World Factbook 2000. http://www.cia.gov/cia/publications/factbook.

as well as greater private sector involvement in the transportation, telecommunications, and energy sectors. Since 1996, inflation has been low and foreign exchange rates stable. Albeit from a small base, Mozambique's economy grew at an annual 10% rate in 1997-99, one of the biggest growth rates in the world. Still, the country depends on foreign assistance to balance the budget and to pay for a trade imbalance in which imports outnumber exports by five to one or more. The medium-term outlook for the country looks bright, as trade and transportation links to South Africa and the rest of the region are expected to improve and sizable foreign investments to materialize. Among these investments are metal production (aluminum, steel), natural gas, power generation, agriculture (cotton, sugar), fishing, timber, and transportation services. Additional exports in these areas should bring in needed foreign exchange. In addition, Mozambique is on track to receive a formal cancellation of a large portion of its external debt through a World Bank initiative.

Namibia

The economy is heavily dependent on the extraction and processing of minerals for export. Mining accounts for 20% of GDP. Namibia is the fourth-largest exporter of fuel minerals in Africa and the world's fifth-largest producer of uranium. Rich alluvial diamond deposits make Namibia a primary source for gem-quality diamonds. Namibia also produces large quantities of lead, zinc, tin, silver, and tungsten. Half of the population depends on agriculture (largely subsistence agriculture) for its livelihood. Namibia must import some of its food. Although per capita GDP is four times the per capita GDP of Africa's poorer countries, the majority of Namibia's people live in pronounced poverty because of large-scale unemployment, the great inequality of income distribution, and the large amount of wealth going to foreigners. The Namibian economy has close links to South Africa. GDP growth should improve in 2000-01, because of gains in the diamond and fish sectors. Agreement has been reached on the privatization of several more enterprises in coming years, which should stimulate long-term foreign investment.

South Africa

South Africa is a middle-income, developing country with an abundant supply of resources, well-developed financial, legal, communications, energy, and transport sectors, a stock exchange that ranks among the 10 largest in the world, and a modern infrastructure supporting an efficient distribution of goods to major urban centers throughout the region. However, growth has not been strong enough to cut into the 30% unemployment, and daunting economic problems remain from the apartheid era, especially the problems of poverty and lack of economic empowerment among the disadvantaged groups. Other problems are crime, corruption, and HIV/AIDS. At the start of 2000, President Mbeki vowed to promote economic growth and foreign investment by relaxing restrictive labor laws, stepping up the pace of privatization, and cutting unneeded governmental spending. His policies face strong opposition from organized labor.

Tanzania

Tanzania is one of the poorest countries in the world. The economy is heavily dependent on agriculture, which accounts for half of GDP, provides 85% of exports, and employs 90% of the work force. Topography and climatic conditions, however, limit cultivated crops to only 4% of the land area. Industry is mainly limited to processing agricultural products and light

consumer goods. The World Bank, the International Monetary Fund, and bilateral donors have provided funds to rehabilitate Tanzania's deteriorated economic infrastructure. Growth in 1991-99 has featured a pickup in industrial production and a substantial increase in output of minerals, led by gold. Natural gas exploration in the Rufiji Delta looks promising and production could start by 2002. Recent banking reforms have helped increase private sector growth and investment. Short-term economic progress also depends on curbing corruption.

Zambia
Despite progress in privatization and budgetary reform, Zambia's economy has a long way to go. The recent privatization of the huge government-owned Zambia consolidated Copper Mines (ZCCM) should greatly improve Zambia's prospects for international debt relief, as the government will no longer have to cover the mammoth losses generated by that sector. Inflation and unemployment rates remain high, however.

Zimbabwe
The government of Zimbabwe faces a wide variety of difficult economic problems as it struggles to consolidate earlier progress in developing a market-oriented economy. Its involvement in the war in the Democratic Republic of the Congo, for example, has already drained hundreds of million of dollars from the economy. Badly needed support from the IMF suffers delays in part because of the country's failure to meet budgetary goals. Inflation rose from an annual rate of 32% in 1998 to 59% in 1999. The economy is being steadily weakened by AIDS; Zimbabwe has the highest rate of infection in the world. Per capita GDP, which is twice the average of the poorer sub-Saharan nations, will increase little if at all in the near-term, and Zimbabwe will suffer continued frustrations in developing its agricultural and mineral resources.

The unresolved land issue in Zimbabwe has recently accelerated lack of confidence in foreign investors and reduced agricultural output. This has unfortunately lead to a gradually worsening economy. SADC leaders are working towards finding a political solution for this difficult situation.

1.3 Problem Statement

It is important to note that high transport costs and system bottlenecks are perceived to continue to prevail despite many efforts to address them, particularly in the form of recommendations made in previous studies, or at workshops, seminars and conferences, or in initiatives by COMESA and SADC/SATCC. In many instances these recommendations have not been implemented or the implementation process is very slow. It is therefore clear that there is a need to identify the reasons for this situation and suggest and implement ways of eliminating system inefficiencies and reducing transit transport cost with renewed vigor and insight in the short, medium and long term. For these reasons, COMESA has requested REDSO for support to undertake and disseminate the results of a study on comparative transit transport cost on the Southern Africa Transport Network. The study area was defined as including Botswana, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe. In order to ensure that the study does not duplicate already available information, a mission was undertaken to the region. During this mission, consultations were made with COMESA,

SADC's SATCC and the Economic Commission for Africa's Subregional Development Center for Southern Africa (ECA/SRDC/SA), and government ministries responsible for transport in five of the seven countries. During the ensuing consultations, the need was expressed for a well-focused study on transportation in the region due to the changing stature of economic and political climate, notwithstanding the findings of other earlier studies that have been conducted in the region and whose findings are being implemented by both COMESA and SADC member states.

1.4 Study Objectives

The overall study objective is to recommend methods of reducing transit transport costs in the study area in order to facilitate regional economic integration and promote the region's international trade competitiveness. The point of departure for this assignment is that a number of studies have already been carried out, that these studies have indicated that the high level of transport costs is a problem, that recommendations have been made to lower costs but that these recommendations have not (all) been implemented or the implementation process is unacceptably slow.

Specific study objectives listed in the SOW (see Appendix G) are as follows:

- To analyze comparative transit costs along different corridors by road/rail/sea/inland water/pipeline and aviation;
- To critically analyze the causes of slow implementation of the various recommendations that are contained in research and workshop reports that can lower transit costs if executed; and
- To propose modalities of hastening implementation of the recommendations and hence lower transport costs in the region.

This study consequently involves the quantification of transit transport costs and the identification of system inefficiencies in selected corridors in the study area, as well as recommendations to improve the situation — both those contained in various COMESA and SADC/SATCC initiatives and those made in other studies, but not implemented for various reasons, and those identified in this current study.

The report therefore focuses on the reasons why, in some instances, there has been little or no progress despite recommendations to eliminate system bottlenecks and reduce costs and, more importantly, what can be done to move forward in such cases. It also investigates how these recommendations should be prioritized. This study therefore builds on previous work and complements both the analyses undertaken in these studies and the results obtained.

1.5 Scope of the Study

This study involves all main modes of transport, i.e., road, rail, sea, inland water, pipeline and aviation. It covers the following eight countries: Botswana, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia and Zimbabwe. All these countries are SADC members. Four

of these countries are also members of COMESA, namely Malawi, Namibia, Zambia and Zimbabwe.

In the SOW, eight main corridors were identified for inclusion in the study:

- Maputo corridor,
- Beira corridor,
- Nacala corridor,
- Tete corridor,
- Durban corridor,
- Dar es Salaam corridor,
- Mpulungu corridor, and
- Walvis Bay corridor.

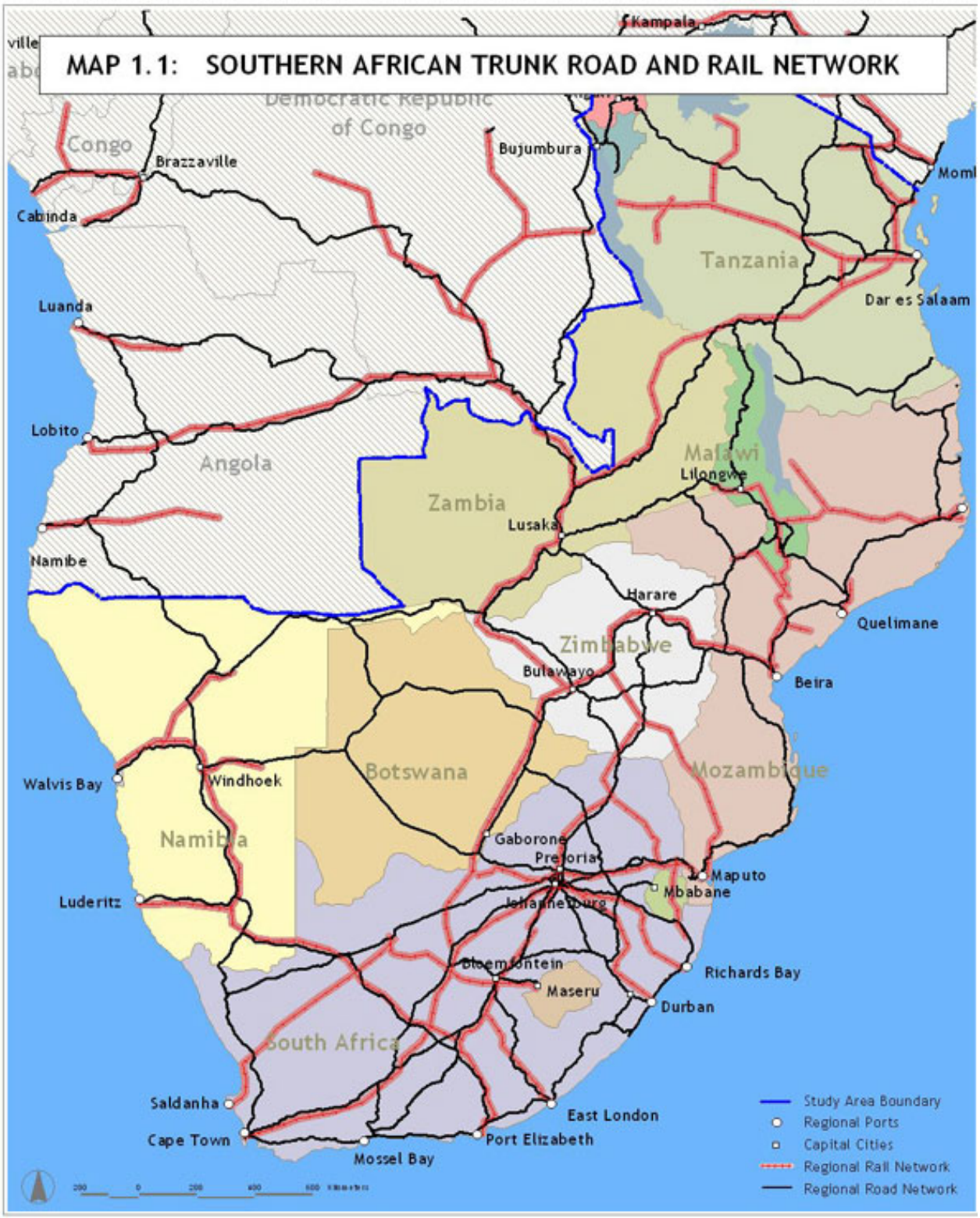
Each of these corridors consists of a number of subcorridors, as explained in more detail in Chapter 2. The current Southern African trunk road and rail network are shown in Map 1.1.

The SOW document details comprehensively the types of constraint that have been realized for each mode of transport. However, until this study there has not previously been an attempt to try and quantify and rank these constraints, some of which are of far more importance than others. In addition, some of these constraints can be grouped together or are dependent on each other. Without this concrete information, it is difficult to develop a holistic strategy to reduce transport costs in the region. Obviously once the really significant constraints become clear, it is possible to focus on the most feasible solutions. Quantification is thus pivotal and this report has assembled important data, despite the extreme difficulty of collecting consistent information in some instances.

A regional workshop was held in Harare on July 9-10, 2001 to discuss the preliminary findings of the study.[2] The proceedings of this workshop are contained in a separate document. Some interesting and useful insights emanated from the discussions at this meeting. Unfortunately, the initial corridor cost comparisons were not available at the time of the workshop. This meant that the workshop discussions on some constraints were based on perceptions rather than facts. Nevertheless, through many detailed interviews and structured questionnaire surveys, the reaction of stakeholders could be assessed with reasonable certainty. It has also become clear that the public and private sectors hold substantially different views on some matters.

The region covered by this study is shown in the Map 1.1. The map also shows the road and railway networks as these represent the two main modes of transport.

[2] *The Southern Africa Transport Network: Modalities of Reducing Transit Transport Cost. Proceedings of the Harare Workshop*. CSIR Transportek, July 2001.



Source: CSIR Transportek

1.6 Study Method

An extensive literature survey was undertaken to identify all relevant previous studies done and research reports produced. This enabled the provision of the correct context for this study.

Stakeholder interviews constituted an important element of this study. This afforded the opportunity to obtain input on a number of topical issues from a wide spectrum of parties directly affected, such as system users, service providers and policymakers. This especially was important to identify and rank system bottlenecks leading to high transport cost, constraints to implementing initiatives by COMESA and SADC/SATCC aimed at reducing transport cost, and strategies to move forward in cases of no or slow implementation. Interviews were conducted by means of both personal interviews (during the period March to September 2001) and electronic questionnaires. Important findings of stakeholder interviews are documented in the main text of the report. Specific details are documented in various appendices to the report. Details regarding personal interviews are contained in Appendix C. Names and contact details of persons interviewed and/or consulted are contained in Appendix D. Appendix E contains an example of the electronic questionnaire. The results of the statistical analysis of information obtained during the electronic interviews are contained in Appendix F.

Cost data were obtained from a number of sources and analyzed to obtain transport cost for each of the corridor/mode combinations. The elements of total cost were classified as either DR and NDR cost, and each of these categories were disaggregated further. Regarding the elements of total cost, special care was exercised not to have too many cost types but, at the same time, not to lose important information by excluding cost types that are critical in the context of this study.

For the sake of clarity, it is important to define the following concepts used in this study and particularly in the chapter on the quantification of transport costs:

- Cost element: “Cost component, cost category or cost type, all of which add up to total cost”.
- Issue: “Problem, deficiency, challenge, system bottleneck, system inefficiency, all of which impact negatively on transport cost”.
- Constraint: “Reason why a given policy/strategy/program aimed at eliminating a given issue has not been implemented or why implementation is slow”.

For the purpose of quantifying transit transport cost, a 12m container with a payload of 20 ton and a gross mass of 24,2 ton was used as the unit of measurement. A container wagon or DZ type wagon will have the dimensions and load capacity (38 ton) to carry one 12 m or two 6m containers. In a sense, it is immaterial whether a 12 m or a 6 m container is selected as the “unit of measurement” for costing purposes, as the cost of transporting a loaded 6 m container generally would be half that of transporting a loaded 12 m container.

1.7 Limitations of the Report

This study was carried out under a number of constraints. These include budget, time and other resources, as well as availability of data. Although these limitations may have impacted on the scope of the study, the authors take responsibility for any omissions.

1.8 Organization of Report

Following this introductory chapter, Chapter 2 provides details regarding transport corridors in Southern Africa. The main corridors are described, and for each corridor/mode combination, start and end points and important centers along the way, as well as relevant distances, are given. Road and rail corridors are also compared in terms of freight volumes, and ports serving the region are compared in terms of capacity and throughput. This chapter further outlines challenges for the transport corridors as well as perceived possible solutions.

Chapter 3 considers the impact of past initiatives to reduce transport costs in the region. Firstly, factors contributing to high transport costs are discussed for each mode. This is followed by an overview of past initiatives by COMESA and SADC/SATCC aimed at reducing transport cost. Strengths and weaknesses of these initiatives, based on interviews with stakeholders, are discussed in Chapter 4.

Chapter 5 contains the results of an analysis of transport cost by corridor and mode, including an intermodal comparison of costs and benchmarking. This chapter also includes the quantification of potential cost savings to be achieved in selected cases.

Chapter 6 contains the findings of stakeholder interviews regarding strategies to enhance the implementation of recommendations and protocols aimed at reducing transport cost. Finally, Chapter 7 contains findings, conclusions and recommendations.

The report also contains a number of appendices documenting information too detailed for inclusion in the main report.

CHAPTER 2.
TRANSPORT CORRIDORS IN SOUTHERN AFRICA

2.1 Introduction

This chapter describes the corridors included in this study. In particular, it describes their origins and destinations, and the route followed in each case. It indicates the principle mode of transport and mode combinations, and gives corridor distances. Road and rail corridors are then compared in terms of freight volumes, and the ports serving the region are compared in terms of their capacity and throughput. Finally, challenges for these corridors and perceived solutions are discussed.

2.2 Description of Corridors

Eight main corridors are identified and described. Each of these has a number of subcorridors, giving a total of 20 subcorridors. During initial deliberations, it was agreed that two further corridors should also be included, namely the Trans-Kalahari corridor and the Durban–Johannesburg–Gaborone–Plumtree–Bulawayo–Livingstone–Lusaka corridor. The resulting 22 subcorridors are grouped under the eight headings. Although this by no means is an exhaustive list of corridors, it nevertheless constitutes a selection of the main corridors in the region.

In 18 cases, subcorridors originate at coastal ports. On eight of these subcorridors, shippers have a choice between two modes of transport. On one corridor, there is a choice between three modes. This means that there are 32 corridor-mode combinations.

Corridors distances vary from 240 km on the Maputo–Lavumisa rail corridor to almost 4000 km on the Walvis Bay–Bujumbura corridor for the road/inland water mode combination. In general, corridor distances (calculated from various sources) are relatively high.

2.2.1 Maputo Corridors

In this case, there are six corridor-mode combinations, namely two for road, three for rail and one for sea transport. The start and end points of these corridors and important centers along the way, as well as relevant distances, are given below.

Road Corridors

Maputo – Lavumisa

Maputo – Namaacha (Mozambique):	78 km
Namaacha – Lavumisa (Swaziland):	185 km
Total:	263 km

Maputo – Johannesburg

Maputo – Komatipoort (Mozambique):	92 km
Komatipoort – Johannesburg (RSA):	469 km
Total:	561 km

Rail Corridors

Maputo – Lavumisa

Maputo – Goba (Mozambique):	70 km
Goba – Lavumisa (Swaziland):	170 km
Total:	240 km

Maputo – Johannesburg

Maputo – Komatipoort (Mozambique):	80 km
Komatipoort – Johannesburg (RSA):	495 km
Total:	575 km

Maputo – Harare (via Chicualacuala)

Maputo – Ed Mondlane (Mozambique):	521 km
Ed Mondlane – Harare (Zimbabwe):	709 km
Total:	1230 km

Sea Corridor

Maputo – Nacala:	2100 km

Corridor details are also shown on the Map 2.1.

2.2.2 Beira Corridors

There are seven corridor-mode combinations, namely three for road, two for rail, one road/rail combination and one road/rail/water combination. The start and end points of these corridors and important centers along the way, as well as relevant distances, are given below. Corridor details are also shown on the Map 2.2.

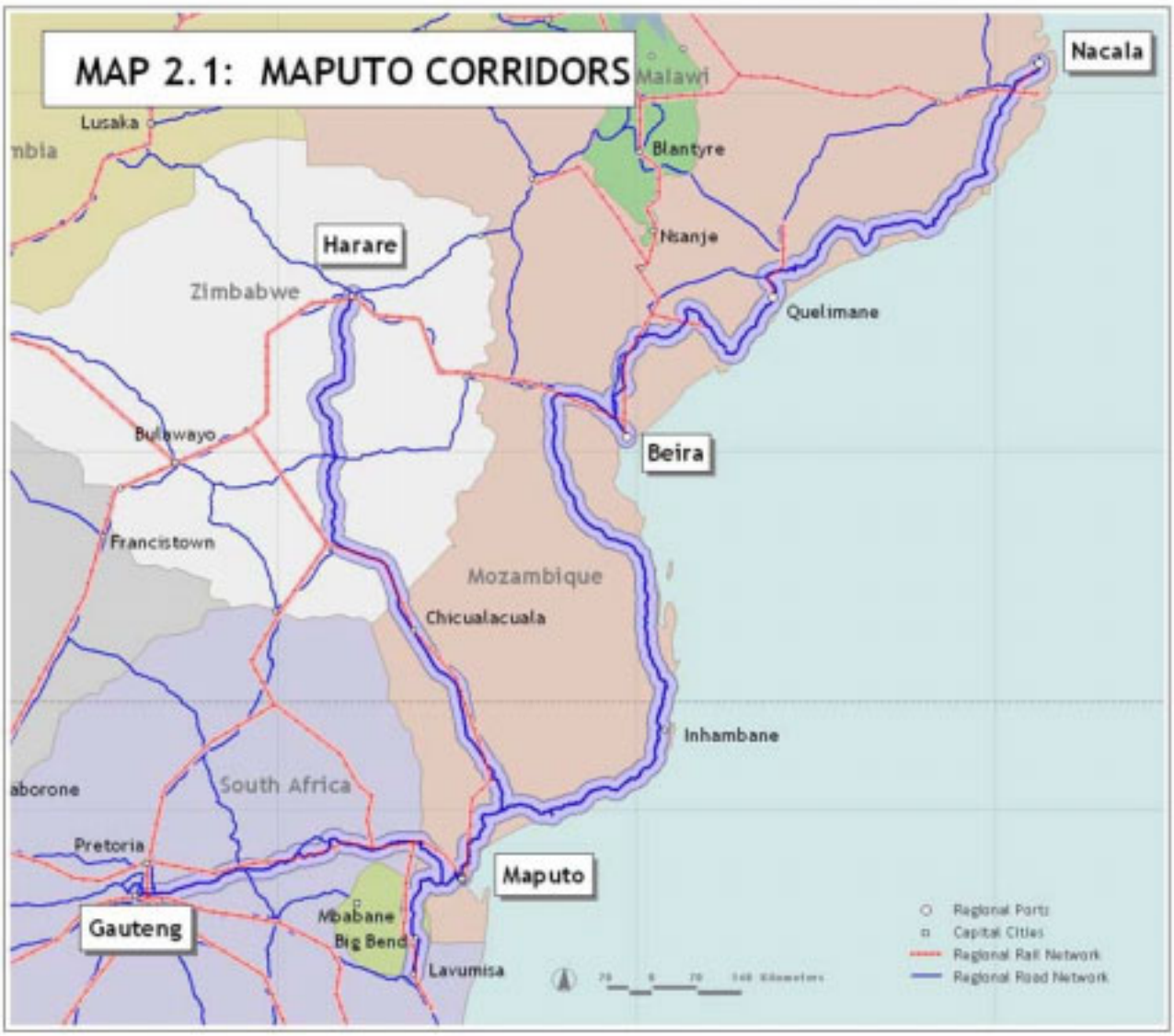
Road Corridors

Beira – Lubumbashi (via Harare and Lusaka)

Beira – Mutare (Mozambique):	296 km
Mutare – Harare (Zimbabwe):	269 km
Harare – Chirundu (Zimbabwe):	354 km
Chirundu – Lusaka (Zambia):	135 km
Lusaka – DRC border (Zambia):	431 km
DRC border – Lubumbashi (DRC):	96 km
Total:	1581 km

Beira – Blantyre (via Tete)

Beira – Zobue (Mozambique):	674 km
Zobue – Blantyre (Malawi):	110 km
Total:	784 km



Source: CSIR Transportek

Beira – Blantyre (via Nsanje)

Beira – Vila Nova de Fronteira (Mozambique):	321 km
Vila Nova – Blantyre (Malawi):	247 km
Total:	568 km

Rail Corridors

Beira – Lubumbashi (via Harare and Lusaka)

Beira – Mutare (Mozambique):	319 km
Mutare – Harare (Zimbabwe):	291 km
Harare – Bulawayo – Livingstone (Zimbabwe):	987 km
Livingstone – Lusaka (Zambia):	440 km

Lusaka – Ndola (Zambia):	300 km	
Ndola – Lubumbashi (DRC):	220 km	
Total:	2557 km	

Beira – Blantyre (via Nsanje)

Beira – Vila Nova de Fronteira (Mozambique):	328 km	
Vila Nova – Blantyre (Malawi):	252 km	
Total:	580 km	

Road/Rail Combination

Beira – Lubumbashi (via Harare and Lusaka)

Beira – Mutare (Mozambique):	319 km	Rail
Mutare – Harare – Lion's Den (Zimbabwe):	412 km	Rail
Lion's Den – Chirundu (Zimbabwe):	209 km	Road
Chirundu – Kafue (Zambia):	95 km	Road
Kafue – Lusaka – Ndola (Zambia):	345 km	Rail
Ndola – Lubumbashi (DRC):	220 km	Rail
Total:	1600 km	

Rail/Road/Water Combination

Beira – Bujumbura (via Harare and Lusaka)

Beira – Mutare (Mozambique):	319 km	Rail
Mutare – Harare – Lion's Den (Zimbabwe):	412 km	Rail
Lion's Den – Chirundu (Zimbabwe):	209 km	Road
Chirundu – Kafue (Zambia):	95 km	Road
Kafue – Lusaka – Mpulungu (Zambia):	1081 km	Road
Mpulungu – Bujumbura (Lake Tanganyika):	650 km	Water

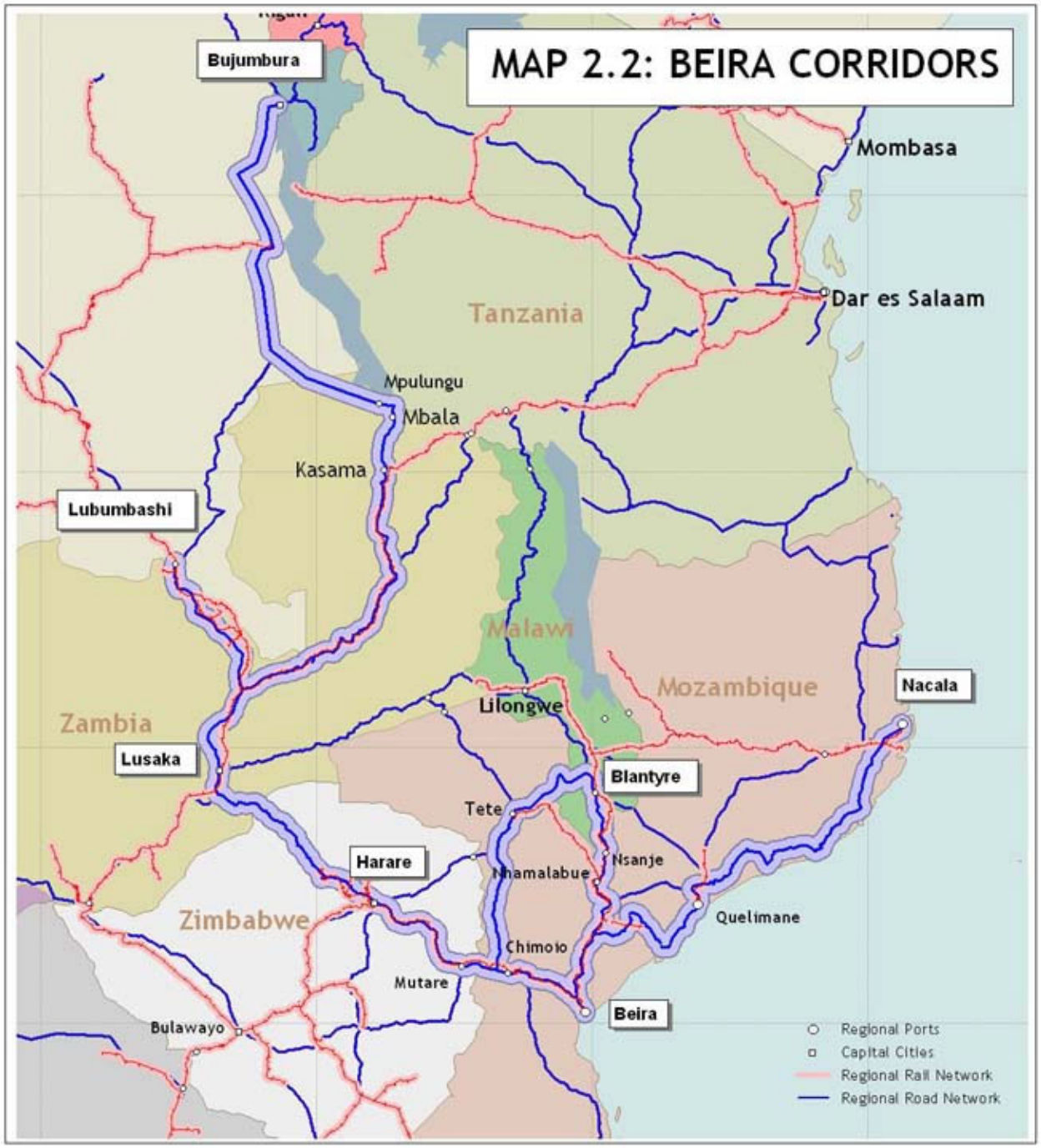
2.2.3 Nacala Corridors

In the case of the Nacala corridors, there are three corridor-mode combinations, namely two for road and one road/rail combination. The start and end points of these corridors and important centers along the way, as well as relevant distances, are given below. Corridor details are also shown on the Map 2.3 following this section.

Road Corridors

Nacala – Lusaka (via Lilongwe)

Nacala – Mandimba (Mozambique):	676 km
Mandimba – Lilongwe – Chipata (Malawi):	494 km
Chipata – Lusaka (Zambia):	604 km
Total:	1774 km



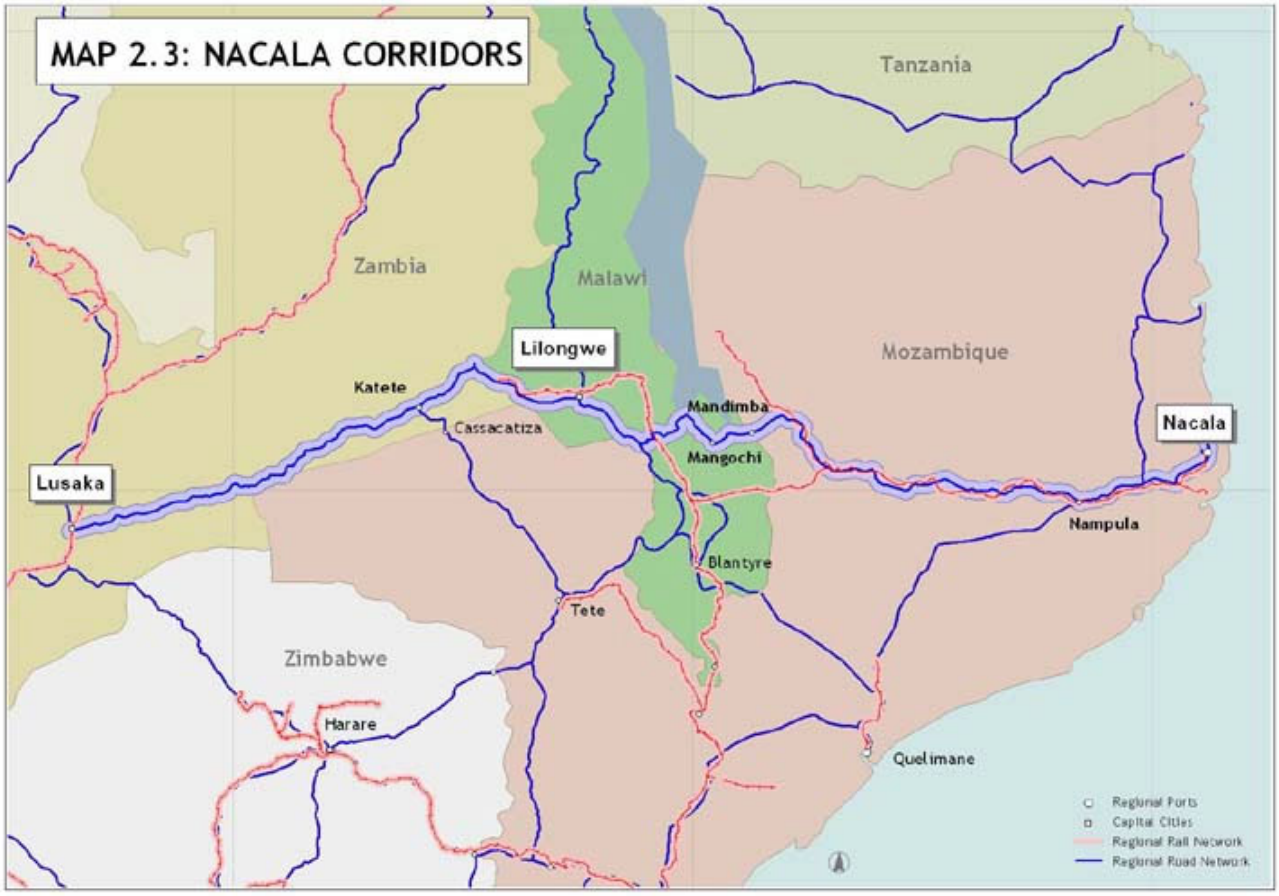
Source: CSIR Transportek

Nacala – Mtwara
Nacala – Mtwara (Mozambique/Tanzania): 756 km

Road/Rail Combination

Nacala – Lusaka (via Lilongwe)

Nacala – Balaka (Mozambique):	720 km	Rail
Balaka – Lilongwe – Chipata (Malawi):	420 km	Rail
Chipata – Lusaka (Zambia):	604 km	Road
Total:	1744 km	



Source: CSIR Transportek

2.2.4 Tete Corridors

In this case, there are only two corridor-mode combinations, namely for road. The start and end points of these corridors and important centers along the way, as well as relevant distances, are given below. Corridor details are also shown on the Map 2.4 following this section.

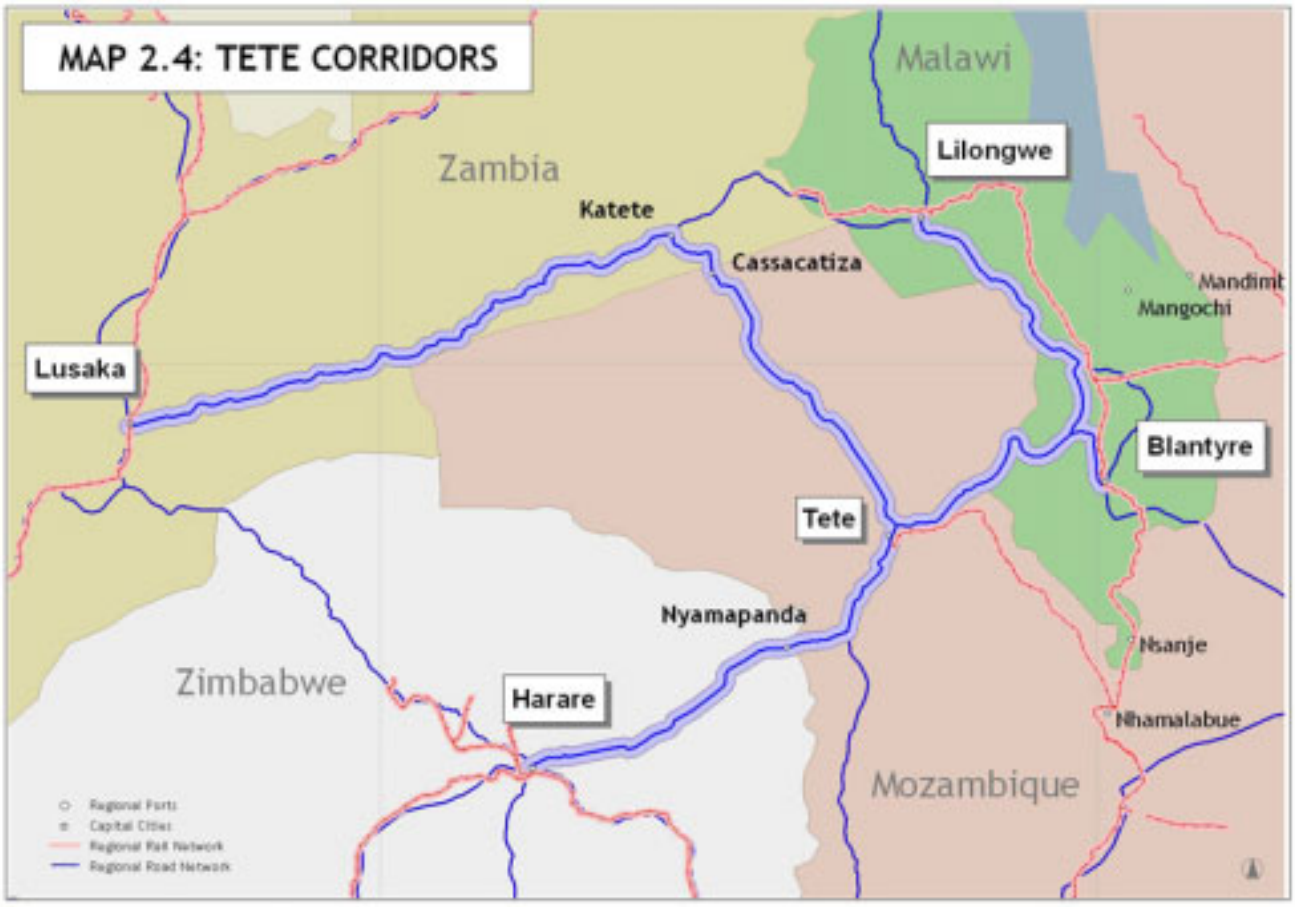
Road Transport

Harare – Lilongwe (via Blantyre)

Harare – Nyamapanda (Zimbabwe):	241 km
Nyamapanda – Tete – Zobue (Mozambique):	223 km
Zobue – Blantyre – Lilongwe (Malawi):	465 km
Total:	929 km

Tete – Lusaka

Tete – Cassacatza (Mozambique):	284 km
Cassacatza – Lusaka (Zambia):	569 km
Total:	853 km



Source: CSIR Transportek

2.2.5 Durban Corridors

In the case of the Durban corridors, there are four corridor-mode combinations, namely two for road, one for rail and one for road/rail combination. The start and end points of these corridors and important centers along the way, as well as relevant distances, are given below. Corridor details are also shown on the Map 2.5 following this section.

Road Transport

Durban –DRC border (via Beit Bridge)

Durban – Johannesburg – Beit Bridge (RSA):	1113 km
Beit Bridge –Harare (Zimbabwe):	578 km
Harare – Chirundu (Zimbabwe):	354 km
Chirundu – Lusaka (Zambia):	135 km
Lusaka – DRC border (Zambia):	431 km
Total:	2611 km

Durban – Lusaka (via Plumtree)

Durban – Johannesburg – Lobatse (RSA):	841 km
Lobatse – Gaborone – Plumtree (Botswana):	672 km
Plumtree – Livingstone (Zimbabwe):	538 km
Livingstone – Lusaka (Zambia):	473 km
Total:	2524 km

Rail Transport

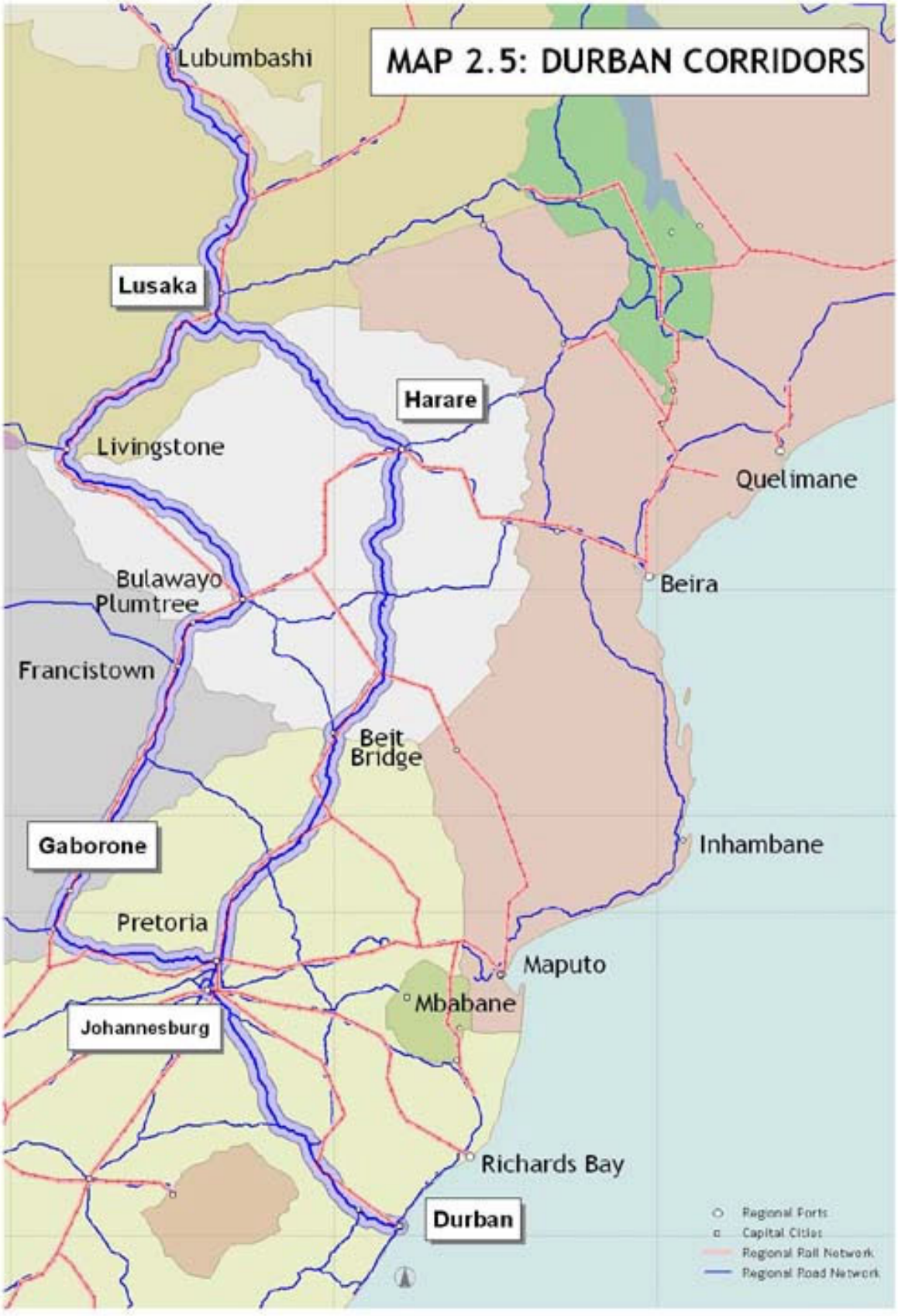
Durban – Lusaka (via Plumtree)

Durban – Johannesburg – Lobatse (RSA):	895 km
Lobatse – Gaborone – Plumtree (Botswana):	625 km
Plumtree – Livingstone (Zimbabwe):	550 km
Livingstone – Lusaka (Zambia):	440 km
Total:	2510 km

Road/Rail Combination

Durban – DRC border (via Beit Bridge)

Durban – Johannesburg – Beit Bridge (RSA):	1341 km	Rail
Beit Bridge – Harare (Zimbabwe):	369 km	Rail
Harare – Lion's Den (Zimbabwe):	121 km	Rail
Lion's Den Chirundu (Zimbabwe):	209 km	Road
Chirundu – Kafue (Zambia):	95 km	Road
Kafue – Lusaka – Ndola (Zambia):	396 km	Rail
Total:	2531 km	



Source: CSIR Transportek

2.2.6 Dar es Salaam Corridors

The Dar es Salaam corridors imply three corridor-mode combinations, namely two for road and one road/rail combination. The start and end points of these corridors and important centers along the way, as well as relevant distances, are given below. Corridor details are also shown on the Map 2.6.

Road Transport

Dar es Salaam – Harare (via Lusaka)

Dar es Salaam – Tunduma (Tanzania):	1005 km
Tunduma – Lusaka (Zambia):	997 km
Lusaka – Chirundu (Zambia):	135 km
Chirundu – Harare (Zimbabwe):	354 km
Total:	2491 km

Dar es Salaam – Blantyre (via Lilongwe)

Dar es Salaam – Mbeya – Kyela (Tanzania):	1018 km
Kyela – Lilongwe – Blantyre (Malawi):	1009 km
Total:	2027 km

Road/Rail Combination

Dar es Salaam – Harare (via Lusaka)

Dar es Salaam – Tunduma (Tanzania):	850 km	Rail
Tunduma – Lusaka – Kafue (Zambia):	1175 km	Rail
Kafue – Chirundu (Zambia):	95 km	Road
Chirundu – Lion's Den (Zimbabwe):	209 km	Road
Lion's Den – Harare (Zimbabwe):	121 km	Rail
Total:	2450 km	

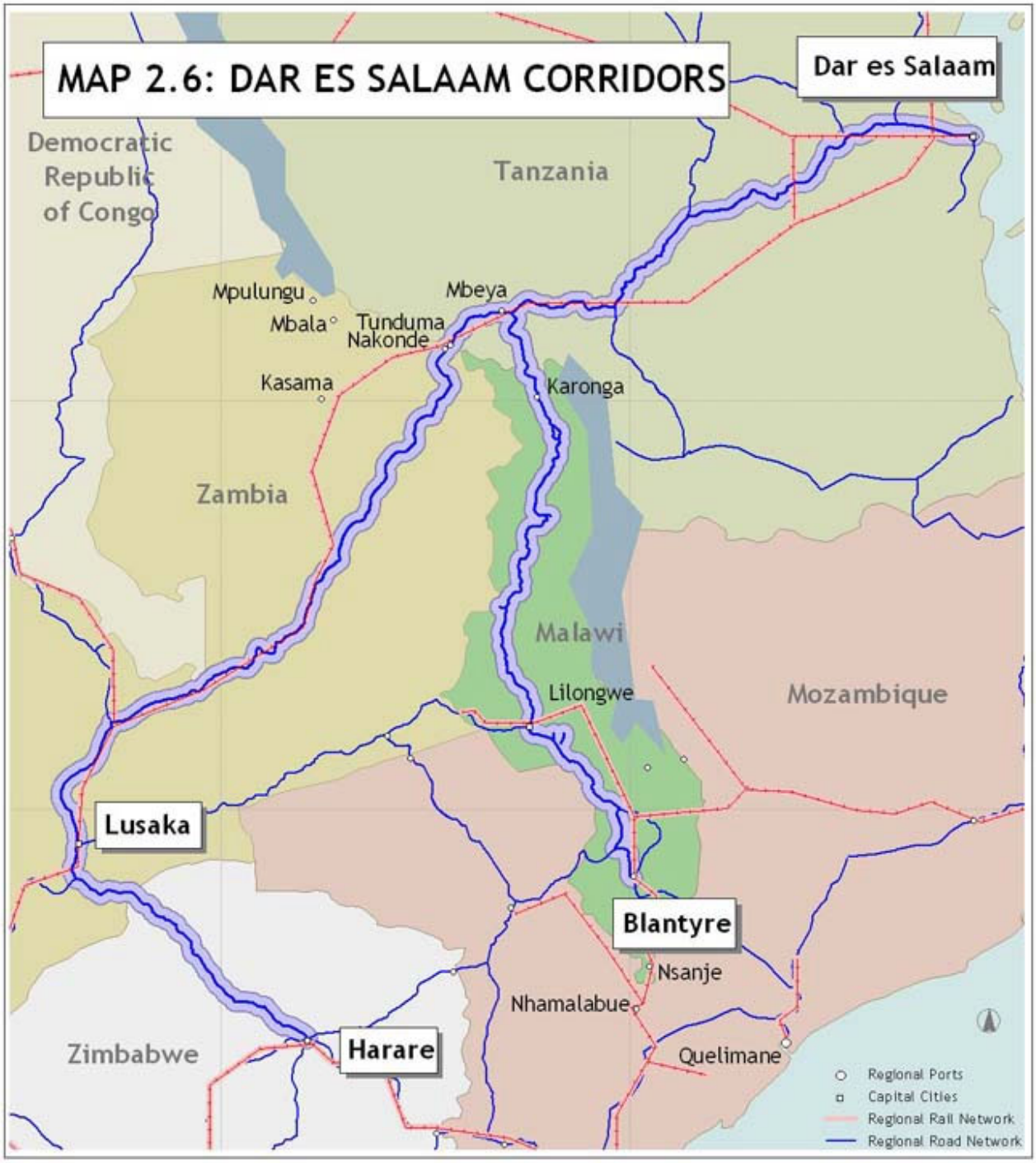
2.2.7 Mpulungu Corridors

There are two corridor-mode combinations. Both are road/water combinations. The start and end points of these corridors and important centers along the way, as well as relevant distances, are given below. Corridor details are also shown on the map following this section.

Road/Rail Combinations

Lusaka – Kigali (via Mpulungu)

Lusaka – Mpulungu (Zambia):	1041 km	Road
Mpulungu – Bujumbura (Lake Tanganyika):	650 km	Water
Bujumbura – Kayanza (Burundi):	119 km	Road
Kayanza – Kigali (Rwanda):	230 km	Road
Total:	2040 km	



Source: CSIR Transportek

Lilongwe – Bujumbura (via Mpulungu)

Lilongwe – Karonga – Chitipa (Malawi):	693 km	Road
Chipita – Mpulungu (Zambia):	328 km	Road
Mpulungu – Bujumbura (Lake Tanganyika):	650 km	Water
Total:	1671 km	

Source: CSIR Transportek

2.2.8 Walvis Bay Corridors

The Walvis Bay corridors constitute five corridor-mode combinations, namely three for road, one for road/rail combination and one for road/water combination. The start and end points of these corridors and important centers along the way, as well as relevant distances, are given below. Corridor details are also shown on the Map 2.8 following this section.

Road Transport

Walvis Bay – Harare (via Maun)

Walvis Bay – Gobabis (Namibia):	577 km
Gobabis – Buitepos (Namibia)::	109 km
Buitepos – Maun – Francistown (Botswana):	1092 km
Francistown – Plumtree (Botswana):	83 km
Plumtree – Harare (Zimbabwe):	548 km
Total:	2409 km

Walvis Bay - Noordoewer

Walvis Bay – Windhoek – Noordoewer (Namibia):	1 186 km

Walvis Bay – Johannesburg (via Gobabis)

Walvis Bay Buitepos (Namibia):	688 km
Buitepos – Ghanzi – Lobatse (Botswana):	891 km
Lobatse – Johannesburg (RSA):	306 km
Total:	1885 km

Road/Rail Combination

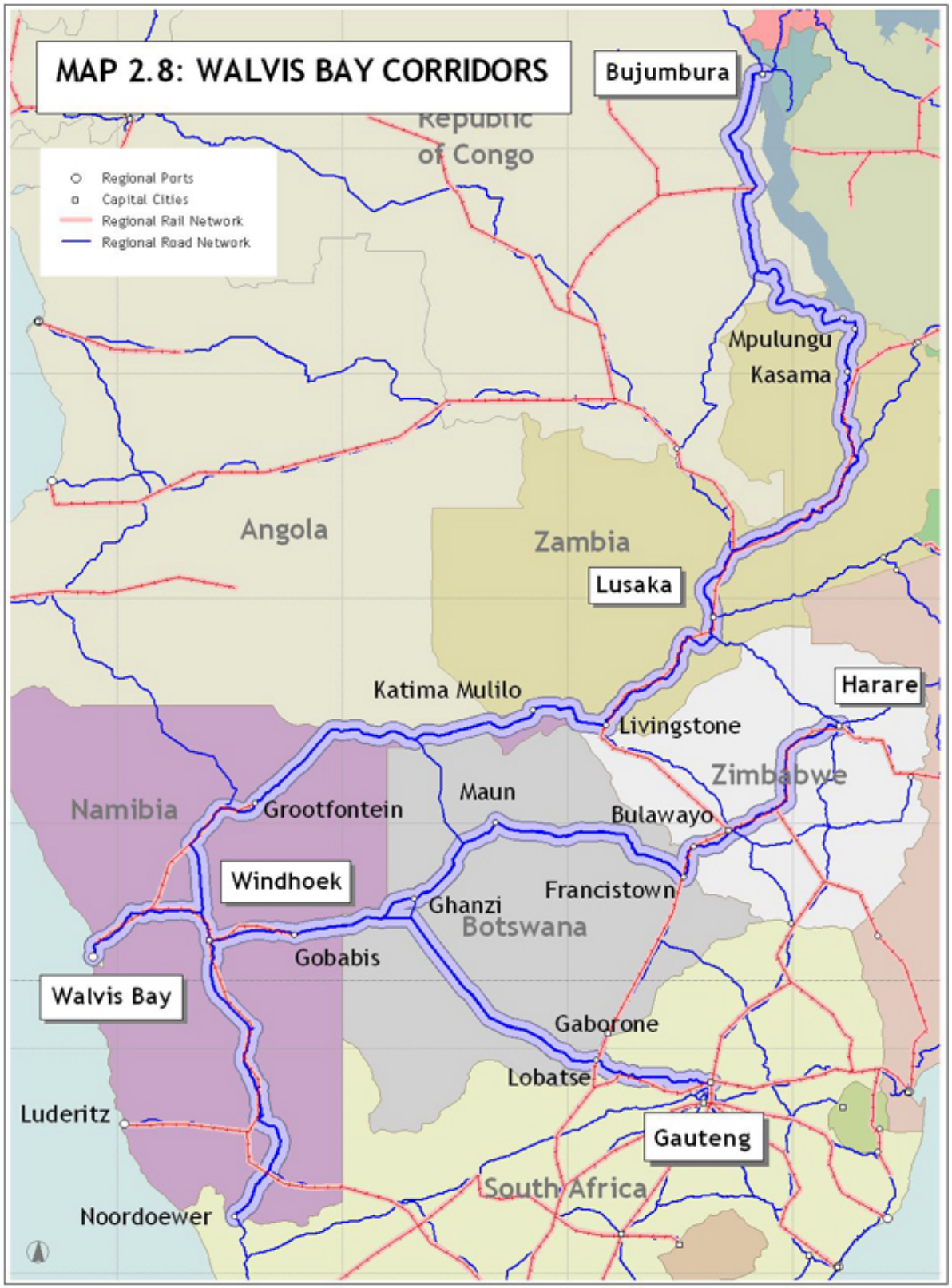
Walvis Bay – Harare (via Maun)

Walvis Bay – Gobabis (Namibia):	694 km	Rail
Gobabis – Buitepos (Namibia):	109 km	Road
Buitepos – Maun – Francistown (Botswana):	1092 km	Road
Francistown – Plumtree (Botswana):	80 km	Rail
Plumtree – Harare (Zimbabwe):	420 km	Rail
Total:	2395 km	

Road/Water Combination

Walvis Bay – Bujumbura (via Livingstone)

Walvis Bay – Katima Mulilo (Namibia):	1458 km	Road
Katima Mulilo – Lusaka – Mpulungu (Zambia):	1693 km	Road
Mpulungu – Bujumbura (Lake Tanganyika):	650 km	Water
Total:	3801 km	



Source: CSIR Transportek

The information on corridor-mode combinations and corridor distances for the different corridors, given on the previous pages, is summarized in Table 2.1 below.

Table 2.1: Summary of Corridor Information

Corridor	Road	Rail	Multi-modal (km)			Sea	Total
Maputo	(km)	(km)	Road/ rail	Rail/ road/ water	Road/ water	(km)	modes per corridor
Maputo - Lavumisa	263	240					2
Maputo - Johannesburg	561	575					2
Maputo - Harare (via Chicualacuala)		1230					1
Maputo - Nacala						2100	1
Beira							
Beira - Lubumbashi (via Harare and Lusaka)	1581	2557	1600				3
Beira - Blantyre (via Tete)	784						1
Beira - Blantyre (via Nsanje)	568	580					2
Beira - Bujumbura (via Harare and Lusaka)				2766			1
Nacala							
Nacala - Lusaka (via Lilongwe)	1774		1744				2
Nacala - Mtwara	756						1
Tete							
Harare - Lilongwe (via Blantyre)	929						1
Tete - Lusaka	853						1
Durban							
Durban - Border with DRC (via Beit Bridge)	2611		2531				2
Durban - Lusaka (via Plumtree)	2524	2510					2
Dar es Salaam							
Dar es Salaam - Harare (via Lusaka)	2491		2450				2
Dar es Salaam - Blantyre (via Lilongwe)	2027						1
Mpulungu							
Lusaka - Kigali (via Mpulungu)					2040		1
Lilongwe - Bujumbura (via Mpulungu)					1671		1
Walvis Bay							
Walvis Bay - Harare (via Maun)	2409		2395				2
Walvis Bay - Bujumbura (via Livingstone)					3801		1
Walvis Bay - Noordoewer	1186						1
Walvis Bay - Johannesburg (via Gobabis)	1885						1
Total corridors by mode	16	6	5	1	3	1	32

2.3 Freight Volumes on Road and Rail Corridors

This section focuses on road and rail corridors as these are the most important modes in the region. Table 2.2 shows that rail transport takes precedence over road transport for cross-border freight traffic. This is the general pattern for most corridors, especially the major corridors, resulting in total rail freight conveyed being 60 percent higher than for road transport (7,418,000 ton versus 4,517,000 tons). Table 2.2 and Figures 2.1 and 2.2 also show the relative importance of corridors: in the case of road transport, three corridors predominate and capture 80 percent of the road freight market, namely the Beira–Lusaka/Harare corridor, the Durban–Lusaka (via Beit Bridge) corridor and the Durban–Lusaka (via Plumtree) corridor. A similar pattern emerges for rail transport, where three corridors capture over 70 percent of the rail freight market. The three most important corridors in the case of rail are the Maputo–

Johannesburg corridor, the Durban–Lusaka (via Beit Bridge) corridor and the Durban–Lusaka (via Plumtree) corridor.

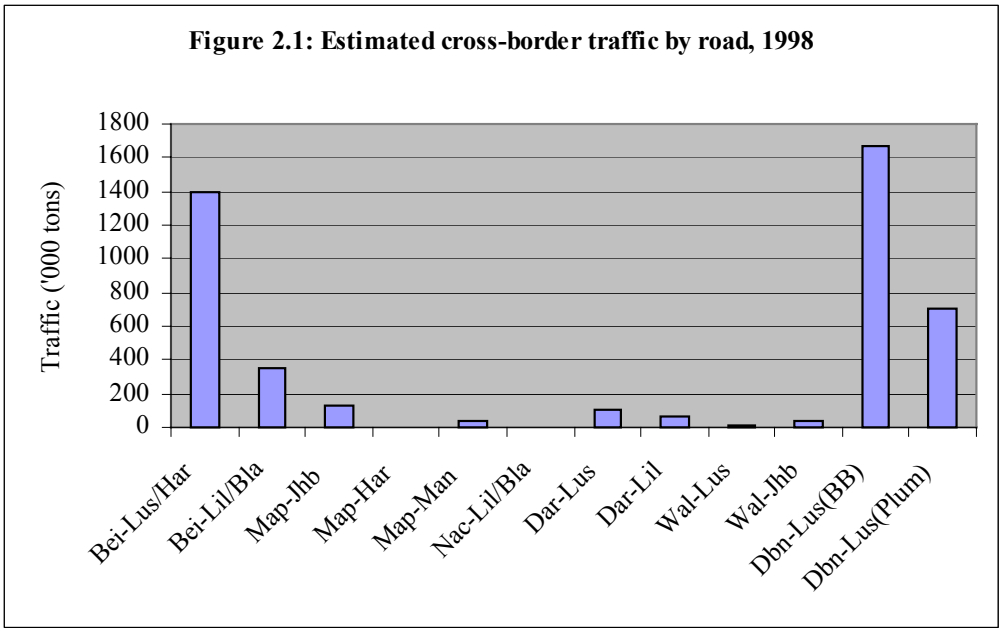
Table 2.2: Estimated Corridor Cross-Border Traffic, 1998 ('000 ton p.a.)

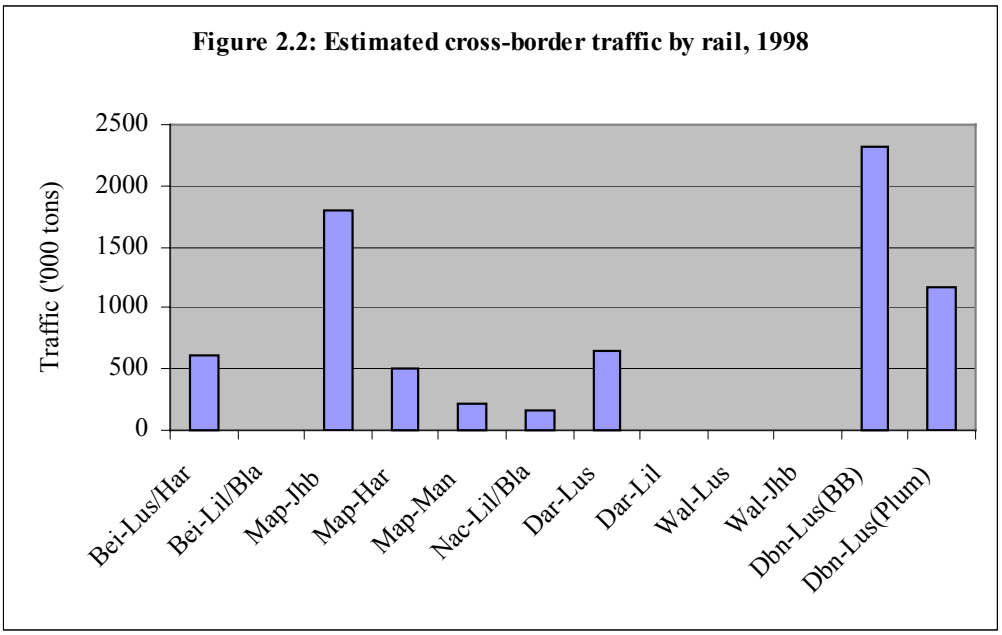
Corridor			Road	Rail
Port	**Origin**	**Destination**		
Beira	Beira	Lusaka/Harare	1400	618
	Beira	Lilongwe/Blantyre	351	NA
Maputo	Maputo	Johannesburg	132	1796
	Maputo	Harare	NA	504
	Maputo	Manzini	36	214
Nacala	Nacala	Lilongwe/Blantyre	NA	153
Dar es Salaam	Dar es Salaam	Lusaka	100	639
	Dar es Salaam	Lilongwe	70	NA
Walvis Bay	Walvis Bay	Lusaka	18	NA
	Walvis Bay	Johannesburg	44	NA
Durban	Durban	Lusaka (via Beit Bridge)	1665	2322
	Durban	Lusaka (via Plumtree)	701	1172
Total			4517	7418

Notes: *NA = Not applicable*

Sources: *Imani Capricorn, based on information from SADC railways, SATCC, CSIR, Driver and de Barros, and interviews of transport participants, with some adjustments by World Bank staff (World Bank report) (2)*

Figure 2.1: Estimated cross-border traffic by road, 1998





2.4 Comparison of Ports Serving the Region

Ports are critical elements of the regional transit transport system. In Table 2.3 the ports serving the regional corridors are compared in terms of selected parameters. In Figures 2.3 to 2.5 they are compared in terms of handling capacity and actual throughput. It is important to observe that, for dry cargo (Figure 2.3), capacity exceeds throughput *by far* at all ports. These differences are however less pronounced in the case of bulk/break-bulk (Figure 2.5). For containers, Figure 2.4 suggests that capacity and throughput at most ports are almost on a par.

From Figures 2.3 to 2.5 it further follows that Durban has by far the largest capacity. In terms of capacity, Durban accounts for about 66 percent of total capacity in the case of dry cargo and bulk/break-bulk cargo. For containers, Durban provides almost 80 percent of regional capacity. Durban is followed by Maputo in the case of dry cargo and bulk/break-bulk cargo. For containers, however, Maputo has one of the lowest capacities in the region. The second most important regional port for containers is Dar es Salaam, at however only 11 percent the capacity of that of Durban.

Table 2.3: Port Capacity and Throughput, 1998 ('000 tons and TEUs)

Item	Port					
Max ship size	**Dar es Sal**	**Nacala**	**Beira**	**Maputo**	**Durban**	**Wal Bay**
Length overall (m)	229	300	200	200	244	200
Draft (m)	9.5	14.500	7.6	9.6	11.6	11.6
Rated handling capacity						
Dry cargo (ton)	4200	1600	2950	6250	38270	3300
Containers (TEUs)	120	30	60	28	1089	50
Bulk/Break-bulk (ton)	2915	1075	2260	5810	23242	NA
Actual throughput						
Dry cargo (ton)	318	108	346	398	9359	202
Containers (TEUs)	110	15	36	24	1080	29
Bulk/Break-bulk (ton)	1986	135	1517	2297	16350	1241

Notes: *NA = Not applicable*
Bulk/break-bulk split not available
Data for liquid bulk not available

Sources: *SATCC Annual Report, 1998 - 99 and Southern African Ports Directory; excludes petrol, oil and lubricants (3, 4)*

Figure 2.3: Handling capacity and actual throughput: Dry cargo, 1998

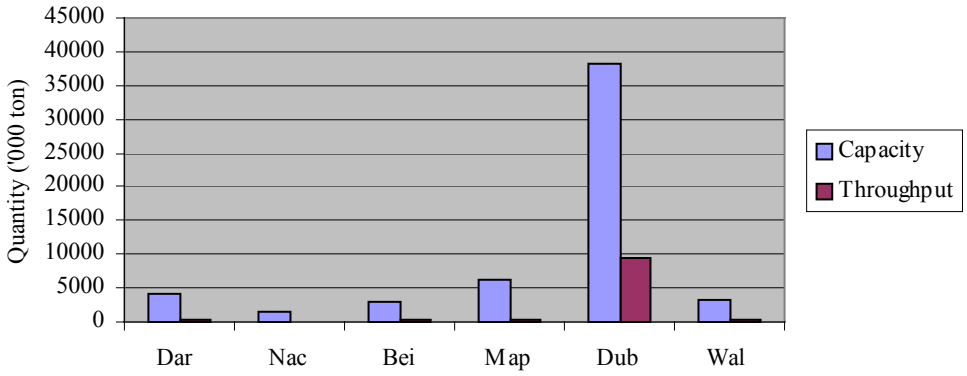
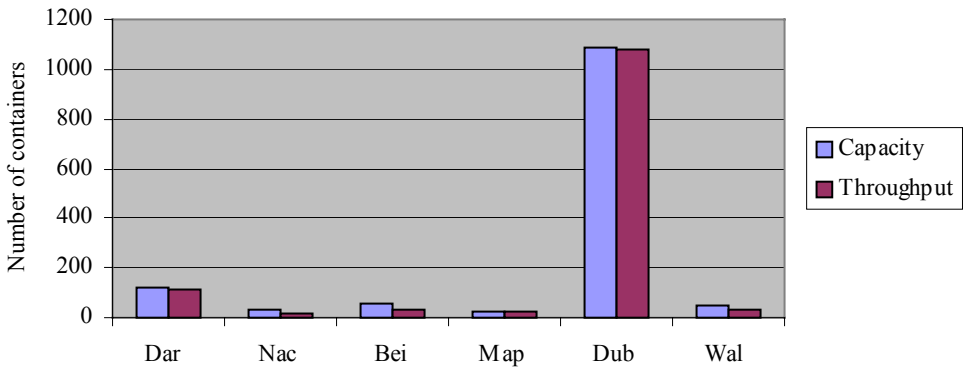
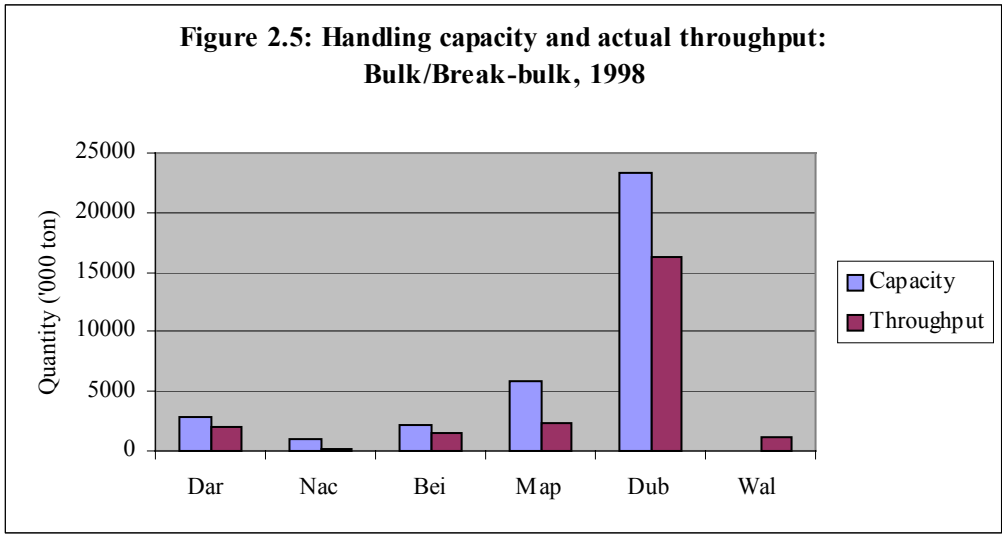


Figure 2.4: Handling capacity and actual throughput: Containers, 1998





2.5 Corridor Challenges and Perceived Possible Solutions

Past research work has revealed the existence of a number of challenges for the transport corridors. These challenges and some of the perceptions about their relative significance and how they should be resolved are discussed here below for each mode. The purpose of this discussion is to set the scene for analysis in the subsequent chapters. This helps to establish whether the perceptions stand up to the rigor of scientific analysis.

2.5.1 Road Transport

Inadequate capacity for industry regulators and service providers to enforce required standards.

In the SADC region as a whole, there is an absence of national transport regulators, and the transport sector is also not regulated on a regional basis. There is currently very little or no implementation capacity in this regard. It has been argued that if the SADC protocols were implemented, the effect on reduction of road transport costs would be long term, while in the short term, costs may actually increase due to stricter controls and higher standards.

Inadequate legislation and enforcement to enhance road safety.

It is generally perceived that improved road safety will reduce the costs to the economy as a whole, and that the legislation is essentially in place, but that the main problem is enforcement. A more rigid and sustainable enforcement program should be implemented, it is thought, which will lead to lower transport costs in the longer term, but increased costs in the short term.

Lack of regionally established policy framework under which governments and the private sector should deliver road infrastructure and related services.

The SADC governments have agreed on the basic policies (strategic goals) and objectives as set out in the protocol on Transport, Communications and Meteorology, but have not agreed on a program for implementation, nor have they agreed on a specific action program for each member state. It is politically difficult to bind each member state to a specific action program, but the first step must be to implement a regular monitoring and report back system, detailing progress made to date. The effect on road transport cost will however be long term.

Lack of resources to continually analyze policy issues for economic management in trade and transportation.

Such analysis is believed to be needed, and could partly be the function of national and regional transport regulators. An independent transport regulator would monitor the performance of the transport sector in relation to the national and regional economic objectives, and implement the necessary adjustments.

Lack of a database that should provide a flow chart to enable stakeholders to review the barriers and achievements as they tackle them.

This is also seen to be part of the essential monitoring exercise and could also be carried out by or through the function of the regulator.

Slow process in the creation of autonomous road agencies and boards to manage road funds and to ensure coordinated road development and maintenance.

The main challenge is to establish autonomous road agencies, with approved budgets and full control over the road development and maintenance funds. This relates partly to the economic difficulties experienced by many of the SADC countries and the ability to formally commit the designated funds. Funds which are initially committed are sometimes later withdrawn due to other national priorities or budgets shortfalls – *it is thus essential that the road agencies are independent and autonomous and that their funding is protected through legislation.*

Low private sector participation in road infrastructure development, ownership and operation.

Private sector road concessioning has increased significantly in South Africa over the last 5 years, but has been limited to the relatively high volume main road corridors. The main difficulty elsewhere in the SADC region is the absence of sufficient traffic volumes on most of the main routes to ensure financial viability of privately funded road concessions – one could consider possible negative concessions, whereby the successful bidder would tender the lowest contribution from the state to operate the road. Unless the volumes are high, the required return on capital investment by the private sector will demand prohibitively high toll fees – the best approach is to invite open proposals from the private sector.

Lack of publicly known road maintenance standards that would attract public support during times of need.

Maintenance or operational standards are defined for the various classes of road – it is a question of monitoring, reporting and prioritization by the appropriate road agency, and linked to the budgets and availability of funds (i.e., the World Bank's Road Maintenance Initiative).

Lack of appropriate mechanisms to use national security forces for infrastructure development and maintenance during the forces down times.

This policy was implemented by Germany prior to the Second World War, as a solution to the problem of unemployment, and is fraught with political dangers. It is generally accepted that this can be done in times of national emergencies, but under normal circumstances is best carried out on an internal departmental or external contractual basis. If use is made of the national security forces, the issues of productivity, responsibility, quality assurance and payment for services will no doubt present some problems.

Lack of or inappropriate policies to deal with domestic/internal distribution aspects that affect the final cost of products to the consumer (i.e., trunk and secondary road connectivity and operation modalities.

In a regional transport sense, this is probably not a major issue, but in a national sense, the development of feeder roads in rural areas is very important and is clearly linked to agricultural and mining development, as well as employment creation. Feeder roads are generally low standard roads, requiring annual maintenance and their condition directly affects transport costs.

The existence of institutionalized corruption in high offices that leads to excessive infrastructure development and maintenance costs.

This is related to the award of road and other infrastructure construction tenders on a non-priority or unplanned basis. There are many instances worldwide of such 'white elephants'. Although funding agencies play a role, perhaps the best protection against this would be the appointment of independent national transport regulators, who would have to approve new schemes.

The existence of cabotage in the industry that leads to idle capacity.

The inability of trucking companies from one country, operating on a regional basis, to carry goods within another country, is effectively a protectionist policy that is difficult to defend, and not justifiable economically. With the gradual disappearance of regional trade and business barriers, this practice is bound to cease.

Lack of independent forums where policymakers, practitioners, the inter-governmental organizations and business people discuss on equal footing.

Transport conferences and workshops are held on a regular basis in the region – several each year – and these are often considered to be effective forums for stakeholders to air their views.

2.5.2 Rail Transport

Inadequate support and enhancement of implementation of transport policy.

National and Regional transport policies are always intended to promote increased efficiency and lowering of operational costs (in order to assist economic growth, and to reduce state subsidies to the railways). However, there is always a resistance to radical change and cost reducing measures within the railway organizations, as well as union pressure against privatization and job redundancies – railways are major employers in all most SADC countries – and the regional private sector road lobby is very powerful, resisting any changes (such as the reduction in permissible axle loads or GVM) which would reduce their competitiveness with rail. Regional transport policies, many believe, require stakeholder agreement and commitment at the policy formulation stage, rather than the implementation stage, and need to be enforced by a powerful appointed Regional Transport Regulator.

Inadequate railway inter networking arrangements.

Regional railway inter networking has been successfully achieved on a small scale by the private sector, and to some extent by Spoornet – there is no doubt that this leads to reduced transport costs, mainly through the reduction in transit times, improved cargo tracking and management and the increased utilization of equipment and infrastructure. There is a fear within the regional railway systems of dominance by Spoornet, (an organization not yet fully committed to a restructuring or privatization program) and an increased role for the private sector should, it is suggested, therefore be encouraged. Privatization could assist inter-networking arrangements.

Inadequate railway interconnectivity.

The SADC railways are generally well inter-connected from the infrastructural point of view – the main inland development nodes all have a choice of routes to alternative ports, and the railway systems are all operating well below their present capacities (although many sections have operational safety and reliability problems). Two key routes remain non-operational due to current or previous conflict situations, namely the Sena line in Mozambique connecting Beira with Southern Malawi and the Lobito Corridor in Angola, connecting eastern DRC to the port of Lobito. The opening of these railway routes will undoubtedly lead to decreased transport costs and increased growth in those regions.

The absence of direct interconnectivity between the 1067-mm Cape system and the 1000-mm East African system is not seen by most experts as a major regional issue. It is considered unlikely that the north south railway route will ever be developed as a major transport route with large volumes, because of the long distances, associated high costs and because the sea route is cheaper (under normal operating circumstances). The TARC operation from Gauteng to Kampala in Uganda via Kidatu, is only viable because the traditional shorter and potentially more efficient routes (via Dar es Salaam and Mombasa ports) are currently suffering from poor operational management. These problems will be resolved by the private sector. Inadequate railway interconnectivity is not considered to be a major factor influencing costs.

There are several new railway projects currently being considered, linking up 'missing gaps', such as linking the Malawi system to Zambia, linking the Botswana system directly to Zambia, and linking the Namibian system directly to the Botswana and Zambia rail systems. These schemes are however highly unlikely to reduce transport costs because of the low projected freight volumes, and could even have an opposite effect.

Misplacement of heavy cargo to road hauliers due to railway inefficiency.

This has clearly happened on a large scale in the whole SADC region, initiated by the deregulation of road haulage. The result was the loss of traffic by the railways, leading to loss of revenue and profitability and failure to respond to changing market conditions. Railways were seen as relatively less efficient than road. Road haulage tariffs have decreased, and railway tariffs have increased in relative terms, and the two modes are now highly competitive on regional long haul routes. Increasing railway operating efficiency will lower railway tariffs and should return some to the present road freight to rail with the net effect of lowering transport costs overall. Many road hauliers operate at very low costs (e.g., Gauteng Durban route) which would be difficult to sustain in the long term, and does not allow for equipment depreciation. In order to be competitive with rail, road tariffs are as low as US cents 2.3/tkm, whereas the industry standard or benchmark would be more than US $0.05/km

Lack of adequate cargo tracking systems in railways.

Cargo tracking on a regional level is clearly inadequate, due to the use of different systems used by the regional railways (Sprint vs ACIS) and this inevitably leads to increased transit costs, loss of revenue and lower equipment and infrastructure utilization — all translating to increased operating costs and loss of customer confidence and loss of business for the railways . Road hauliers are not faced with the same problem because customers deal with the same operator on both ends of the route. There is clearly scope for increased involvement of the private sector in cargo tracking and management, and the current railway restructuring programs should initiate this.

Slow restructuring and concessioning process that has locked out private sector investors for too long.

Private sector participation does not necessarily lead to reduced transport costs. The granting of concessions to the private sector for monopoly services, will increase efficiency, productivity, investment and profits, but not necessarily reduce transport costs. Economic regulation will be necessary and a regional transport regulator, with a meaningful executive authority, will have to be established. The slow pace of restructuring, and the uncertainties associated with this, inevitably lead to increased costs due to lack of morale and ambition amongst the railway staff, and a cessation of capital investment and reduced maintenance expenditure during the transition period. The transition period in Zimbabwe has now lasted four years without a clear indication of the final approved restructuring strategy and program. Private sector participation in the regional railway network must be accompanied by regulated and guaranteed open competition between alternative routes and modes, if this is to lead to a

reduction in transport costs. The experience with the BBR railway in Zimbabwe illustrates this.

Lack of cost reduction policies coupled with inefficient management systems.

This is an obvious problem, but the regional railway organizations are virtually all constrained financially and politically. One of the main cost issues is large staffing levels and the question of redundancies. In this regard, the World Bank support for restructuring of the regional railway companies has focused on a commitment to privatize, and direct support for a staff reduction program. The US $100M support recently provide to CFM in Mozambique was mainly linked to staff reduction.

Inappropriate railway/road/lake (river) /pipeline interfacing that inhibits mode complementarity and competition.

The provision of transshipment facilities is linked to customer demand and overall logistics costs, and is best developed and managed by the private sector. The regional ports provide the best example of transshipment facilities that affect the efficient operation of the whole logistics chain, and it has been conceded in all the SADC countries that terminal operations should be concessioned to the private sector in order to achieve acceptable levels of efficiency and costs. In some cases, e.g., Mozambique the marine operations at the ports have also been concessioned. Different transport modes are traditionally operated by different companies and there is always a reluctance to 'give away' traffic.

Inappropriate tax systems that make railways subsidize roads through biased tariffs.

This is relevant from the point of view that the petrol and diesel purchases by railways often include a road maintenance levy (railways should be exempt from this) and that road maintenance is often borne directly by the state and light vehicles, rather by the heavy road hauliers who are responsible for virtually all the damage on the roads. These issues are being addressed on national and regional levels, driven by the desire to make railway more competitive – the tendency is to extract more contributions from the road hauliers.

Lack of effective regulatory institutions for the transport industry (sector).

It seems clear that if effective monopoly services such as ports and railways are to be managed by the private sector, a certain degree of *economic* regulation will be necessary, in order to monitor and control manipulation and cost increases. There is always a tendency for cost to increase to what the market can bear. The essential role of Safety and Environmental regulators is well understood and accepted.

Lack of infrastructure maintenance culture that precipitates to poor operational performance.

The lack of proper maintenance procedures is more a result of financial and management constraints than the question of culture. The regional railway organizations are generally

staffed by highly competent and skilled technical staff, who fully understand the importance of maintenance, but are almost always constrained by budget limitations, mainly insufficient spares. This also results in poor job satisfaction and low morale, often seen as a cultural problem. There are innovative ways of resolving these problems, for example by getting railway customers to fund the maintenance programs, through tariff discounts, but this requires a completely new approach by management, probably something that can only be achieved through private sector involvement

Lack of environmental pollution control policies that can be effectively enforced for the benefit of other social services.

This is a cause for concern, particularly if budgetary constraints force incorrect practices to be adopted, leading to longer-term liabilities. It is, however, not seen by most experts as a key cost issue from a current operations point of view.

Lack of known performance indicators that can aid arbitration during conflicts.

Performance indicators are used extensively by all the railway operators, but as long as the railways are not provided with the resources (either public or private) to operate along normal business principles, the use of these in conflict resolutions cannot be effective. The railway operators need to be able to guarantee a minimum performance against a bond or penalty system, in order to improve customer confidence levels

Inappropriate business focus due to state dominance (interference) in the industry.

Most of the SADC railway systems run at a substantial loss, with the exception of Botswana Railways, Swaziland Railways and recently Spoornet in South Africa. The state continues to provide financial support – reluctantly, and too little, too late — because the railways are strategic to the operation of the economy. The result is that the railways continue to survive no matter how poorly they perform, and this does not lead to 'an appropriate business focus'. Privatization or concessioning of operations is clearly a solution to this, where management is held fully accountable to the shareholders, but this can also be done in a state owned corporation.

Other factors

In addition, a major factor influencing the railway transport costs is the *absence of competition* on many of the regional routes. There is generally a high degree of competition between railway and road transporters, which has resulted in the lowering of road haulage costs on traditional railway routes. The absence of competition, or the enforcement by railway operators of preferred routes, has however also resulted in increased costs. For example, customers do not have the choice of using the Botswana route from Gauteng to the Copperbelt, although it appears to be much cheaper than the designated Beit Bridge route. Open competition between alternative railway routes, enforced by a regional transport regulator, could solve this problem, but a better arrangement could be to offer open access to

different private sector operators on the main regional routes – this would not necessarily lead to full privatization of the national railway operating companies.

2.5.3 Marine and Inland Water Transport

Low cargo availability in the region due to inability to consolidate available cargo.

Low volumes inevitably lead to higher operating cost and tariffs. In the case of the regional seaports, low volumes will mean smaller vessels, higher costs and less frequent ship calls, leading to less cargo being sent to the port. This is a typical 'chicken and egg' situation and it is very difficult for a port to recover its position once it has been lost to another port. (ref Durban–Maputo) The port with the largest freight volume will usually be upgraded to accept larger vessels, which attract significantly lower sea freight rates and in turn attracts more traffic. Large ports will therefore be more competitive and tend to expand until restricted by regional demand and physical constraints. Smaller ports, restricted to smaller vessels (by demand or depth restrictions) will often act as feeder ports for the larger ports, and their growth will be limited to the catchment area defined by the lowest total logistics cost to the buyer – and inevitably the lowest transit time. Essentially the consolidation of cargo in a particular port is dictated by the buyer, not the seller — the marketability of a port, for most general cargoes, including containers, is a slow process.

There is low-capacity building for shippers organizations.

This is seen to be a highly competitive market, with several large regional organizations, but also many smaller ship's agents and freight forwarders. It does not require much capital, but requires specific experience, marketing ability and contacts. It is a specialized business that can only be operated by highly experienced staff. This is not considered to be a factor that affects transport costs.

Lack of proper forums to promote regional shipping lines in partnership with major international lines.

A partnership between smaller regional shipping lines and larger international shipping line, is unlikely to lead to a reduction in shipping costs, as it will remove rather than increase competition. The shipping sector has a long tradition of collusion and manipulation of costs, through the operation of conference lines. Adequate forums exist between regional and international shipping lines — they either compete or serve each other and have direct working contact through the ships agents and freight forwarders. This is not a transport cost reduction issue — shipping cost is mainly dictated by vessel size and small ship owners often compete directly with larger ship companies.

Low indigenous private sector participation in the industry.

The participation of indigenous private sector interests may be desirable from a capacity building point of view, but is not a transport cost reduction issue. The industry is characterized by both very small local and large international companies, but requires experience and track record — it is a business for experienced professionals. New operators or entrants will have

come from the established operators, and an example of this is the development of the Greek shipping sector, which includes many small international operators and owners.

Coastal services dominating traffic to ports due to hub port principle coupled with the super large vessel development that has left many of the ports wanting by way of infrastructure and facilities for such ships.

The concept of hub and feeder ports is an inevitable consequence of the increasing size of vessels and increasing operating costs, which means that the new generation vessels will only make direct calls to ports with adequate capacity (depth) and high capacity handling and management systems. The larger handymax vessels can cost in the region of US $ 40,000 per day in port. This means that most of the container traffic is fed to Durban by smaller 350 teu vessels, to be transshipped to larger plus 2500teu vessels. The development of new larger container vessels, up to 8000 teu and more, will require the development of larger regional transshipment ports such as Coega (Ngqura). This process is difficult to reverse without the implementation of a major anchor project that can provide the required minimum volumes for direct calls, and means that goods are often transported by land over long distances to Durban, with the additional land transport cost being offset by the savings in sea transport costs. This development has also been driven by the need to reduce overall logistics costs or order to remain globally competitive.

Inadequate shipping services and capacity in major lakes and rivers. This is further complicated by the poor interface between inland waterways and other modes of transport.

The provision of improved services is dictated by market demand, although there is a tendency for improved facilities to attract additional customers. This has not worked, for example on Lake Malawi, where the equipment and infrastructure is virtually new but hardly used. This can either be left to the private sector, or a comprehensive market survey should be carried out through a government initiative in order to formulate the best development strategy. This is seen as a clear transport cost reduction issue.

Shippers experience high costs of handling containers due to container overstay and high demurrage charges.

The problem of empty container congestion is perceived as a problem in many of the regional ports and contributes to capacity problems, inefficiency and hence higher costs. Containers are often delayed in order to utilize a specific route that is slower but much cheaper. This is again a question of achieving the lowest total logistics costs, which often mean that certain transport components or legs are more expensive, to be offset against the savings elsewhere. The question of how best to deal with ‘abandoned ‘ containers is a port management and policy issue.

Low port efficiency in most ports that does not match the just in time (JIT) principle of doing business.

This is generally perceived as a question of reliability, predictability and planning rather than a question of port volumes. It has frequently been demonstrated that customers are willing to pay more for a more reliable service — hence the continued use of Durban port by customers as far as Lubumbashi and Blantyre. Port inefficiency clearly leads directly to higher transport costs. Again, private sector management appears to be the most effective solution – it will be interesting to monitor the future performance of the privatized Maputo port against the non-privatized South African ports (where only the terminal operations are to be privatized).

Inadequate pollution control standards that engenders marine life and hence resources that can support trade.

Inadequate pollution control standards are undesirable, and may have longer terms negative economic and environmental consequences, but do not impact on transport costs in the short to medium term. Environmental standards in all the SADC countries should be equivalent to the best international practice, the problem is capacity to implement these standards under difficult economic conditions. The process of privatization tends to solve these problems because the private sector operator assumes legal responsibility for complying with the given standards (monitored by an environmental regulator), and due to the fact that institutional financing is impossible to secure without a full environmental impact study and approved procedures — privatization in fact improves the situation. This is not considered a significant transport cost issue.

Weak management practices and very slow concessioning/privatization implementation in ports.

This has plagued the operation of the East African ports such as Dar es Salaam and Mombasa, and is generally attributed to high port costs and loss of customers and revenue. On the positive side, it appears that these two ports are now in an open competitive situation (and scheduled for privatization/concessioning), and the Mozambique ports are in the final process of being privatized (Maputo, Beira and Nacala) to different operators and are in open competition with each other for certain sectors of freight traffic. This is a healthy sign and will lead to cost reductions. In South Africa, the port terminals are being opened to private or independent operators, while the marine services for all the ports will remain under Portnet – not ideal, but at least Maputo will provide some competition to Durban for the traffic from Mpumalanga, and this will no doubt see a reduction in costs. The South African port charges are in any event perceived to be too high, mainly because of the monopoly situation that exists and also the practice of charging wharfage in order to ensure sufficient income to subsidize the loss making division of Transnet. This practice is about to be revised and is in any event not sustainable in an open competitive market. The speeding up of the privatization process or alternatively providing clarity on the restructuring strategy and programs, will also assist in reducing costs in the short term. Regional coordination on the port restructuring process has been almost completely absent.

Cross subsidies among different berths, between general cargo berths and container terminals that is costly to efficient operations per berth.

is inevitable that a port operator should subsidize less profitable operations with more profitable operations — this would be normal practice in any business in order to promote the core services — effectively developing a 'loss leader'. Portnet's high charges have in the past been used to support the losses made by Spoornet, although this system is being revised. This need not necessarily lead to increased total logistics costs, but is a manipulative and undesirable practice, often used to "knock out" any competition. The privatization of the port terminals will put an end to this, but in South Africa, Portnet will still be able to subsidize the services in one port with the profits of another port in order to keep a competitive advantage between, say, Durban over Maputo. The practice of cross subsidization should, it is felt, be monitored and controlled by a regional transport regulator.

Poor port information base to clients and lack of data interface between port operators and customs, policy, railways and road hauliers.

This can be a significant problem in the SADC ports that serve landlocked countries, utilizing the resources of the neighboring systems. The most common problem is the shortage of sufficient railway wagons to serve the port — very often a communication problem, but also often a cargo information and tracking problem, and poor management of optimum equipment utilization. This can be a major cost factor, and can lead to substantial vessel demurrage costs. The development of information systems should be the prime responsibility of the port operator or authority, and should be part of the marketing of the port services

Long and delayed cargo clearing procedures.

This is a real problem, often seen to be linked to corrupt practices, rather than inefficiency, leading directly to increased costs and loss of business to competitive ports. Open competition between ports, and the involvement of the private sector in port operations is believed to be the best remedy – this problem can also be dealt with by a regional transport regulator.

Lack of frequent and common consultative forums for port authorities, railways, road operators and pipeline owners.

There are many consultative forums for the transport and port operators – many conferences, seminars and workshops in the SADC region every year – and also institutions and associations such as SATCC, SARA, COMESA, RailRoad Association, and others. However, regional cooperation and coordination is still seen to be lacking, particularly in respect of the restructuring program, mainly because of fear of dominance and competition. Spoornet in South Africa, which remains state owned and controlled, has a clearly stated expansionist policy of seeking to operate the neighboring privatized railway systems, which causes some fears in other SADC countries.

Lack of marine transport operating and performance standards.

The implication is that proper benchmarking will lead to a desire to achieve improved results. South Africa, Mozambique, Tanzania and Kenya are all signatories to the IMO conventions.

Improved performance standards or goals are best achieved through competition between ports.

High level of port state controls that lead to bureaucratic approaches when dealing with port problems.

This has been a problem in the programming and commitment to the port restructuring process, mainly because of the key strategic economic importance of the ports — a fear of losing control. The initiative by Mozambique to privatize its ports (a difficult, expensive and time consuming process) has assisted the resolution of this problem.

Lack of adequate security and hence poor safety that leads to high insurance premiums.

Lack of security in the ports is a significant problem which does lead to increased costs because of losses or increased premiums – it is generally only the higher valued cargoes, such as copper cathodes or manufactured products, which are stolen. However this is not the main issue – suppliers are unable to meet their contracted supply orders and buyers are affected by non-arrival of goods. This leads to an erosion of confidence and reduction in sales price, or at worst a cancellation of orders. This is a legitimate reason for switching to a more secure port, even if the cost is higher. This is perceived as one of the reasons why South African ports are still favored by many SADC customers, even with higher transport costs. Lack of security leads to higher transport costs. Private management of the ports is expected to resolve this problem — in Beira and Maputo improved security systems have been, or are about to be, implemented by the private operators.

2.5.4 Aviation

Taxation on equipment and facilities

Most airlines and airports in the region are government-owned, and taxation is not always directly applicable on facilities. In such cases, therefore, taxation would not be a causal factor in high air freight charges.

Restructuring and privatization

An official report on the progress and way forward for restructuring and privatization in the air transport sector by the relevant authorities in the region has not been undertaken; a situation which leaves a vacuum in the air transport policy area. There is a need for clarity and direction regarding the future form which air transport in the region may take. This is complicated by the fact that political priorities will play a significant role in respect of the issue of privatization of what are mostly state airlines in the region. In theory, restructuring and privatization should bring efficiency benefits, although evidence on this aspect internationally is not definitive in this respect.

Liberalization

The airline industry internationally is characterized by consolidation into groupings and alliances and in the face of an "open skies" arrangement, there is a danger of larger global alliances dominating local and regional air transport markets with negative impacts on competition in the sector. If this results in reduced transport costs this may not necessarily be a turn for the worst. A possible model could be regional partnerships with international players. However, a powerful grouping of airlines in a dominant position along these lines may not result in reduced charges and transport costs for the region. The need for liberalization may have actually increased following the worldwide decrease in traffic in the wake of the recent terrorism attacks in the USA.

Safety

New ATNS (Air Transport Navigation Services) facilities are expensive due to their technological component. These costs will probably be passed on by the airports to airlines in terms of landing fees and the cost recovery thereof.

Airline capacity utilization

Capacity utilization on some routes is good, domestically (e.g., Durban–Johannesburg) but remains a problem regionally, due to the perceived poor performance of the regional economy and an absence of economies of scale due to the number of small airlines in the region. Indications are that capacities are sufficient for air freight for the time being within the region, apart from periodic increases in demand in specific sectors which are dealt with through extra charter flights.

Domestic and regional air transport costs versus International

Domestic and regional air transport charges are considered high relative to international operations. There seems to be a substantial element of cross-subsidization amongst airlines from domestic/regional to international, due to the pressure faced by regional airlines in competing internationally. This remains an issue for the regional transport authorities to solve as it could be an inhibitor of competitiveness to industry in the region.

Code sharing

Code sharing has been an issue in terms of competition practice in both the E.U. and the USA because although it promises to reduce air transport costs in the short term it may result in a few large airlines dominating the market, who would then be free to exploit their position in the future in the absence of regulation. In this regard, Southern Africa is unlikely to lead but will follow international practice.

Regulation and recommendations on the future of airlines

Regulation of air transport in SADC requires clarity and coordination amongst the air transport sectors in the region, in line with such arrangements as the SADC protocol. The region must, it is suggested, begin to consolidate its collective position, moving from a

collection of small national airlines unable to fully exploit economies of scale, to one of a few larger (possibly regional) airlines on a commercial basis, with appropriate levels of regulation, e.g., air transport charges.

2.5.5 Pipelines

The state of ownership that affects the service costing for commodities delivered

All major pipelines in the region are perceived to be natural monopolies in the economic sense. This means that it is the type of infrastructure that the private sector would not ordinarily undertake to provide due to immense capital cost involved, or where it would not be profitable to provide more than one pipeline between any two points. This monopoly situation implies that charges by a private sector operator would probably be high due to the powerful position of the monopolist. While these companies do make profits under state ownership and there could be an argument that would advocate for lower tariffs to reduce this, there is no reason provided by economic theory to believe that the situation would be any different under private ownership. The tendency for a private sector monopolist would be to maximize profits (and therefore transit costs/charges) in any event. Road and rail have become more prominent as alternatives but neither can match pipelines in terms of the cost advantages they have in the transport of bulk liquids and gas.

Safety

There is no reported trend of deliberate breaches or fires occurring to pipelines in the region, as was the case in Nigeria in recent years. However, spillages have been reported by the pipeline operators, but this issue seems to have been dealt with in terms of environmental impacts and seems to be a relatively seldom event. Petronet reported two spillages in the 1998/1999 financial year which were dealt with. Tazama reported 15 leakages involving the loss of 260.7 metric tons in the year 1998/99. Although these incidents involve loss of product and environmental cleanup costs, they remain relatively slight in comparison to the volumes moved and no lives have been reported lost or persons injured. There is no reason to believe that the losses due to spillages/leakages have impacted on tariffs charged by the pipeline operators.

Intermodal competition and modal choice

All of the pipelines in the region have met with competition from road and rail operators. This has been the case particularly since the deregulation of road freight by the countries in the region in the late 1980s or early 1990s. That volumes, especially of refined product, have found their way onto road and rail for long distance operations is a particular concern for transport authorities in the region given that pipelines would normally be the cheapest mode. This practice of intense competition by road and rail with pipelines would seem to be result of the following factors:

- increased pressure on state-owned rail operators to increase their share of volumes and become more commercially-oriented, prior to or after their privatization;

- the lowering of transport tariffs by road and rail operators to extremes in the absence of regulation, when faced with significant empty backhauls;
- intense competition in the freight transport sector following deregulation which has led to an oversupply of capacity in the sector, again resulting in low tariffs charged by competing modes (often not quoted and difficult to detect via normal research questionnaires); and
- an increasing preference of clients for volumes to be provided more quickly with fewer intermodal transfers, an option difficult for pipelines to provide due to their static and inflexible nature.

Transport costs in the region would therefore seem to be distorted due to the excess of capacity and other factors, rather than pipeline charges being excessive *per se*.

Distribution and the impact of middlemen

By its nature, the fuel supply system involves some level of wholesale operation and middlemen, as well as use of depots and other facilities. However, the cost of these facilities is usually relatively small in terms of the total cost and is not a significant factor in terms of transit costs and charges.

Modal interfaces at terminals

Other modes are necessarily involved in the distribution of product to and from pipelines. These intermodal facilities are necessary and the costs unavoidable. Bearing this in mind, it is apparent that these costs add to the overall cost of transporting fuel but take place outside of the pipeline operations per se.

2.6 Comment on Perceptions

This chapter details the perceptions around problems besetting the transport industry in the region. For each mode, a number of challenges are discussed. However, it is not possible as yet to rank them because there is little real evidence as to which are the most important, while others are generic and may impact on several problem areas at the same time and in different ways. It is clear, though, that each mode has a distinct role to play and that there are many issues that are mode specific. The above suggests that there is an urgent need for quantification of the matters raised so that the reader can understand the relative impact of each of the challenges identified and how each relates to the others. The remainder of this report is focused on clarifying which perceptions are significant and which are not, or are dependent on other factors.

CHAPTER 3.
THE IMPACT OF PAST INITIATIVES TO REDUCE TRANSPORT COSTS IN THE REGION

3.1 Introduction

This chapter discusses the impact of factors influencing transport costs and tariffs and then examines initiatives by COMESA and SADC/SATCC to reduce these costs. The transport structures under these organizations are explained, and an historical background as to where they originated and their development and coverage to date are given. Various sources were consulted for this purpose. The information in respect of factors influencing high costs of transport is derived mainly from inputs from previous work undertaken by consultants for the regional organizations.

3.2 Factors Influencing High Costs

3.2.1 Road Transport

It is estimated that road transport accounts for more than 80 percent of all freight transport volume conveyed in the SADC region. In addition, nearly all other modes of transport for general goods are linked to road transport transshipment on both ends of the journey, with the exception of bulk mining products. Most of the road transport volume (in terms of net ton km) is made up of relatively short haul traffic, which is effectively considered captive to road, but an increasing volume of long distance traffic (more than 300 km) has moved from rail to road over the last decade. This shift has been due to four main factors:

- The deregulation of road traffic. Previously, road haulage was carried out on a permit system, with the national railway operators operating their own road haulage companies, and this was changed to open access for private sector road hauliers on a regional basis. This created several large and efficient competing regional road haulage companies.
- Increase in permissible Gross Vehicle Mass (GVM), allowing the road hauliers to compete directly with railway operators. This allowed road hauliers to compete directly with rail in respect of fully laden 12 m containers over long distances.
- The partial failure of the national railway operators to provide a reliable, predictable and cost efficient service — the reasons for this are complex, and are not only related to poor management and lack of investment.
- The regional conflict situations, which effectively closed some of the main railway corridors (e.g., Benguela line, and both railway links to Malawi) and rendered others unreliable. Road transport became the preferred mode for the export of copper from Zambia and DRC, irrespective of cost, because of transit time and security considerations.

Railway transport should be cheaper than road transport over long distances and for large volumes, but these two modes are highly competitive in the SADC region because of the reduction in rail volumes, and because of the fierce competition between road hauliers. *The*

result is that road transport costs are generally considered very low for general goods, relative to rail in the region – profit margins are, however, low and the full costs of equipment depreciation are not always applied. Operating constraints also still remain which can further reduce costs — e.g., infrastructure condition, border delays etc.

Increased GVM and axle loads have led to increased efficiency and lower vehicle operating costs, but also to significantly increased damage to the roads and higher maintenance demands, especially because of overloading and poor enforcement of axle load regulations, which in turn lead to slower operating speeds and higher vehicle maintenance costs (due to poor road conditions). There has been a proposal from South Africa that there should be a review of existing regulations and possibly a lowering of the permissible GVM that would also induce a shift from road to rail for targeted long haul traffic. For this to take place, railway competitiveness will have to increase. Spoornet has estimated that a total of 436 m tons of goods are transported by road in South Africa annually, of which 43 m tons are transported along the main railway corridors. Spoornet has stated that it will target about 30 percent of this traffic over the next 20 years. This reopening of the appropriateness of existing legislation needs also to be discussed with SADC in the light of the move towards harmonized regulations.

The main advantage of road transportation is flexibility – it is able to adapt quickly to changing circumstances and offers an effective seamless service on a regional basis — the transit times and security are generally also better because they are controlled by a single organization along the whole transport route. On the other hand, the costs associated with delays for road hauliers at border posts, and the escalating costs of road tolls and user fees, are clearly affecting the competitiveness of road transportation. It is important to harmonize road user charges to ensure that full cost recovery takes place to optimize the balance between road and rail as rail infrastructure is fully recovered through tariffs.

A major operational and cost issue is the deterioration of the main regional road due to increased heavy traffic and the absence of effective maintenance programs. Donor support for road reconstruction has also decreased, based on the not unreasonable demand for the implementation sustainable road management programs to be put in place first. Due to the generally poor economic situation in many of the SADC countries, the designated road funds are sometimes diverted to other government departments and priorities – road agencies in some cases require a higher degree of autonomy to be effective.

It should be possible to enhance the future competitiveness of road transport by the development of new regional multimodal systems, including road/rail transshipment centers – the objective would be to optimize the performance and costs of the transport corridor as a whole. This will require a high degree of regional planning and cooperation — already approved in principle in the SADC protocols.

3.2.2 Rail Transport

Transport costs are generally perceived to be very high in the Southern Africa region, particularly for land locked countries such as Malawi and Zambia (and effectively the eastern part of DRC) — countries outside COMESA and SADC, such as Rwanda, Burundi and

Uganda are also severely affected. The fundamental reasons for the high transport costs are long distances and low volumes, but also many other factors, some linked to the previous and existing regional conflicts and the shrinkage and collapse of the regional economies — compounded by lack of capital investment and maintenance and poor management of the railways. The railways have been a financial burden on the state, and because of the declining economies, have effectively been starved of financial and management resources. At the same time, in order to provide the necessary essential transport services, the road transport sector was deregulated and the private sector was given a free hand — and responded accordingly. The result has been that rail transport costs have risen, road transport has become more competitive and the road hauliers have captured much of the traffic that traditionally belonged to rail. This trend, however, is not confined to African but is a worldwide phenomenon.

It is generally perceived that rail should be cheaper than road for many commodities transported regionally, and that rail is more environmentally friendly (in terms of safety and fuel efficiency) and should therefore be promoted. It is argued that road transporters do not pay for the full cost of the infrastructure provision and maintenance (hence the implementation of user charges and greater enforcement of traffic regulations), and that some railway operators pay the road maintenance levies as part of their diesel costs. These issues are being addressed. Road hauliers argue that the road levy in some countries is not being used for road upgrading and maintenance despite the agreement of the protocol.

Virtually all the regional railway systems are currently undergoing some form of restructuring with involvement of the private sector. In all cases, the intention is that the state will retain ownership of the infrastructure and that the private sector will be granted an operating concession for a limited period, generally 15 to 25 years. Spoornet is the only major regional railway that has not yet fully committed itself to some form of privatization, but it has at the same time sought to become the operator of the privatized regional railways. This has in some ways contributed to delays in the regional privatization process because of fears by some SADC countries of being dominated or controlled by Spoornet. There are fears expressed that the railway systems will be operated in a manner to serve “South African interests”, such as the effective closure of the Botswana route in favor of the more expensive BBR route operated by Spoornet, and also the recent contract to route the exports from the Copperbelt in Zambia through the port of Durban. Spoornet is actively seeking to become the private railway operator in the Maputo Corridor (CFM South) and Zimbabwe/Zambia.

The main problem facing the transport sector, and the railway sector in particular, is that privatization of a monopoly service is proceeding, but without the appointment of a Regional Transport Regulator. This allows the private sector operators to manipulate the choice of railway route and the tariffs — a large proportion of railway freight traffic is captive to railway and can tolerate further increases in tariffs in order to maximize the income to the railway operator, which may be damaging to the regional economy as a whole. Cost is often not the major factor which governs the choice of transport mode and route — other key factors include security, predictability and transit time, hence longer and more expensive routes are sometimes favored instead of traditional cheaper routes which suffer from poor management or effective coordination between different systems. Other factors, such as shipping patterns and choice of port of call are also important, and explain why Swaziland

exports all its containers through the much longer route to Durban, rather than the much shorter route to Maputo. There is always a resistance by customers to change from a transport system that has been shown to work well, unless the performance of the alternative system can be guaranteed, and the private sector has to be convinced the real improvement has taken place. Hence the urgent need for more private sector participation, but with the need for a degree of regional regulation.

The existing capacity of the regional railway system is well in excess of demand, although there are serious operational problems, mainly due to lack of proper maintenance, capital investment/renewal and poor management/coordination. The efficient management of operations is more important than the provision of new infrastructure — it is pointless having high permissible operating speeds if the trains or wagons stand still for several days at a time. Significant cost reduction in railway transportation could be achieved through improved utilization of existing resources — equipment, infrastructure and human resources. This is best achieved according to many respondents through private sector participation, such as concessioning or open access to multiple operators, because of the need to be competitive and profitable.

3.2.3 Other Factors Influencing Regional Road and Rail Transport Costs

The three key 'environmental' factors that influence regional road and rail transport costs in the Southern Africa region are well defined and understood:

Long transport distances. The average distances between the main population and industrial/business centers, and the closest export/import port, are generally between 500 km and 1000 km, much longer than most developed countries. In order to increase the global competitiveness of the region, this increased transport cost must be offset by improved operational efficiency and regional planning — such as the optimum siting of major industries and industrial development zones (IDZs).

Low volumes of traffic. The tkm per route km on all the SADC rail systems are very low by international standards, and this leads directly to poor equipment and infrastructure utilization. In addition to lowering current high costs (given that the total regional transport volume remains relatively constant), the only other solution appears to be to focus on the development of specific high volume regional rail corridors, such as Coallink and Orex, but should this be at the expense of other strategic rail routes and corridors. This would be politically unacceptable since the intention of a new strategy is to grow the regional economy.

Many landlocked countries with additional border crossings and hand-over points on their main import and export routes. This clearly leads to a decrease in efficiency and an increase in costs for both road and rail (processing delays and inspection/hand over delays respectively) and is one of the key focus areas of the SADC Transport Protocol – the implementation of 'seamless' transport services between the SADC countries.

The reduction in transport costs is directly linked to the increase in trade — the consultants working on the USAID RAPID program are of the opinion that "halving transport costs would

stimulate an increase in trade by five times" (ref. presentation at the Africa Rail 2001 conference). The issue, however, is whether this scale of reduction is achievable.

There are many other issues in addition to these key factors, mainly related to efficiency of operations, competition between routes and modes, condition of infrastructure, lack of capital investment, poor management etc. — some of which are listed in the SOW for this study and discussed in Chapter 2. All of these issues impact on total logistic costs which, together with service characteristics such as reliability and frequency of service and trip duration, affect users' choice of corridor and mode.

3.2.4 Marine Transport

While the South African and Namibian ports are generally considered to be efficient, but expensive, in international terms, the East African ports which are intended to serve the majority of the SADC states and central and east Africa, are widely considered or perceived to be even more expensive and are unreliable and inefficient. The situation appears to be gradually improving, driven by the privatization and restructuring programs in all the regional ports, and because the individual ports are now openly competing with each other, even in the same country — this is the most important cost reducing and service enhancing factor.

Exporters or the buyers of goods or commodities are generally concerned about three main factors:

- total logistics cost,
- total transit or delivery time, and
- security/reliability/predictability.

Transport cost is not always the deciding factor, but given a competitive situation where the other key requirements are being met, cost becomes all important. The port and sea transport costs most often exceed the land transport costs, except for large volumes of bulk minerals such as coal, oil and iron ore. Sea transport costs are largely dependent on volume, particularly the size of vessels and shipment. The cost of shipping iron ore or coal to destinations anywhere in the world can be as low as US $5-7 per ton in large capacity (Cape size) vessels of +120,000 dwt. In small vessels, say 15,000 dwt, the freight rate can be up to six times higher. The main reason that goods are transported in small vessels is either because of the limitations of the receiving port or because the buyer cannot or does not want to accept larger volumes.

Freight transport is moving more and more towards containerization, except for bulk minerals and special products such as copper, granite, steel etc. International shipping in Southern African waters is largely handled by the Southern African/Europe Conference Sailings (SAECS) lines. With the reduction in freight volumes through the east coast ports over the past 25 years and the introduction of larger specialized container vessels, SAECS decided to abandon direct calls to the smaller ports and to rather have these act as feeder ports for the larger ports such as Durban, where the container volumes are higher and the operation more efficient. All container vessels calling at Nacala, Beira and Maputo, bound for Europe, also

call at Durban. This has meant that the transport by land of goods directly to Durban, even over long distances, often achieves the lowest total logistics cost. This explains why bananas are transported 500 km by rail from Komatipoort to Durban, rather than 70 km to the container terminal in Maputo (this is an extreme case that does not make economic sense) — containers from Swaziland are all sent to Durban, 300 km further than Maputo. Maputo was once Africa's busiest port, and it is unlikely to fully recover this position, although substantial expansion should be possible with improved efficiency, management and new investment. There is always a great reluctance for customers to change from a system that has been proven to work well, even if significant savings are offered. Low port volumes mean less regular ship calls and vice versa. Low volumes also mean smaller vessels and most often substantially higher sea freight costs — making the port less attractive for some customers.

3.2.5 Inland Water Transportation

Lake transportation in central and eastern Africa is clearly a strategic service – in many cases there are no alternative modes of transport to remote areas. Northern Malawi and large sections of eastern DRC, Rwanda and Burundi are not served by rail, and often the roads are impassable for many months during the rainy season. The rift valley lakes are major waterways — Lake Malawi is more than 500 km long and Lake Tanganyika more than 700 km long. Transportation by lake should provide a cheap and reliable transport service, but the service is slow, the volumes are low, the ships are small (about 500 to 1500 dwt), all resulting in high unit operating costs. In addition, the operating risks are high (weather and climate/seasonal changes, failure of specialized equipment) and there is the additional cost of transshipment and harbor fees at both ends. Transport costs on Lake Tanganyika have been quoted at US $35/ton from Mpulungu to Bujumbura, a distance of more than 700 km[3], with additional harbor and handling fees of US $15/ton, indicating basic tariffs of US $0.05/tkm and an all in rate of US $0.07.1/tkm. The tariffs on Lake Malawi are similar, although the freight services have been disrupted for many years due low lake levels restricting access to the ports and flood damage to the main port access roads – illustrating the high degree of operational risks. The tariffs on Lake Malawi are given as US $117 per teu for a 68 teu container vessel (34 x 12m containers, about the same as one train)[4]. The potential for reducing operating costs for lake transportation in the short term is very limited, due to the low volumes and high cost of low utilization of expensive equipment. Lake transportation services are best run by the private sector on an open competitive basis, as a strategic or essential service, possibly qualifying for a degree of state subsidy, particularly for passenger services. The granting of exclusive operating concessions should be avoided, as this will increase transport tariffs.

River transportation was extensively used in the past, but is now very limited, except in areas where there is no alternative. The main reason for decline is the specialized nature of the service, relatively low volumes and high operating costs, and very high operational risk – hence this can only be considered where there no alternative mode of transport exists, such as the Congo River in DRC. In today's world, private sector or institutional funds and investment will not be provided to a major project which is reliant on a transport system which subject to

[3] Bo Giersing. Personal communications, July to September 2001.
[4] Ibid.

risk of being non-operational on a regular basis due to climatic, weather or environmental events — i.e., acts of God. The development of river transport systems is therefore limited to strategic services — passenger and vehicle ferries — rather than cost competitive main freight transport services, except where alternative road and rail services are not provided. There has recently been a renewed interest in developing the Zambezi River transport system, but mainly motivated by the continued closure of the Sena railway line.

3.2.6 Aviation

Regional air tariffs in general are higher than those between major regional centers in North America and Europe. This can be ascribed primarily to high overhead costs and low volumes leading to diseconomies of scale. Capacity utilization on some routes is good, domestically (e.g., Durban–Johannesburg) but remains a problem regionally, due to the poor performance of the regional economy and an absence of economies of scale due to the number of small airlines in the region. There seems to be a substantial element of cross-subsidization amongst airlines from domestic/regional to international, due to the pressure faced by regional airlines in competing internationally. This remains an issue for the regional transport authorities to solve as it could be an inhibitor of competitiveness to industry in the region. Regulation of air transport in SADC requires clarity and coordination amongst the air transport sectors in the region, in line with such arrangements as the SADC protocol. The region must begin to consolidate its collective position, moving from a collection of small national airlines unable to fully exploit economies of scale, to one of a few larger (possibly regional) airlines on a commercial basis, with appropriate levels of regulation, e.g., air transport charges.

3.2.7 Pipelines

Pipeline tariffs for Petronet are lower than tariffs for Petrozim and Tazama pipelines. While this can also be ascribed to higher volumes and economies of scale, it is also affected by factors such as the status of capital investment, depreciation costs and the extent of maintenance and other overhead costs.

All of the pipelines in the region were originally natural monopolies in the economic sense, but some competition with other modes does occur. Natural monopolies result from the type of infrastructure that the private sector would not ordinarily undertake to provide due to immense capital cost involved, or where it would not be profitable to provide more than one pipeline between any two points. This monopoly situation implies that charges by a private sector operator would probably be high due to the powerful position of the monopolist. While these companies do make profits under state ownership and there could be an argument that would advocate for lower tariffs to reduce this, there is no reason provided by economic theory to believe that the situation would be any different under private ownership. The tendency for a private sector monopolist would be to maximize profits (and therefore transit costs/charges) in any event. In both instances there is a case for an independent regulator. Road and rail have become more prominent as alternatives but neither can match pipelines in terms of the cost advantages (except over short distances) they have in the transport of bulk liquids and gas.

All of the pipelines in the region have met with competition from road and rail operators. This has been the case particularly since the deregulation of road freight by the countries in the region in the late 1980s or early 1990s. The fact that volumes, especially of refined product, have found their way onto road and rail for long distance operations is a particular concern for transport authorities in the region given that pipelines would normally be the cheapest mode. This practice of intense competition by road and rail with pipelines would seem to be result of the following factors:

- increased pressure on state-owned rail operators to increase their share of volumes and become more commercially-oriented, prior to or after their privatization;
- the lowering of transport tariffs by road and rail operators to extremes in the absence of regulation, when faced with significant empty backhauls;
- intense competition in the freight transport sector following deregulation which has led to an oversupply of capacity in the sector, again resulting in low tariffs charged by competing modes (often not quoted and difficult to detect via normal research questionnaires); and
- an increasing preference of clients for volumes to be provided more quickly with fewer intermodal transfers, an option difficult for pipelines to provide due to their static and inflexible nature.

Transport costs in the region would therefore seem to be distorted due to the excess of capacity and other factors, rather than pipeline charges being excessive per se.

3.3 Past Initiatives by COMESA and SADC to Reduce Transport Costs

3.3.1 Initiatives by COMESA Structures

3.3.1.1 Objectives and Basic Policy Guide

The overall objectives of COMESA in brief are to attain sustainable growth of the member states; to promote joint development in all fields of economic activity; to cooperate in the creation of an enabling environment for investment; to cooperate in the promotion of peace, security, and stability; to cooperate in strengthening the relations between the Common Market and the rest of the world and to contribute towards the establishment, progress, and the realization of the objectives of the African economic community.

3.3.1.2 COMESA Structures

The main policy organ is the *Authority of the Heads of State and Government.* It is responsible for general policy and meets once a year. The *Council of Ministers* consists of ministers of government designated by each member state. With regard to transport, there is a committee of ministers responsible for transport and communications that forward its decisions to council for adoption. The council is responsible for policy recommendations to the Authority and meets twice a year. There is also an *Intergovernmental Committee*, which consists of senior government officials as designated by each member state. This committee is responsible for the development of programs and action plans. It is also responsible for ensuring the

monitoring and implementation of the provisions of the treaty and for making recommendations to the council.

Technical committees are responsible for the preparation of comprehensive implementation programs and for monitoring their implementation while *Ad hoc* committees are appointed from time to time to deal with specific issues. A *Consultative Committee* is responsible for providing a link and facilitating dialogue between the business community and other interest groups and organs of the Common Market. In addition a *Secretariat*, headed by the Secretary-General, is the principal administrative organ of the Common Market.

The *COMESA Court of Justice* ensures adherence to law in the interpretation and application of the Treaty. The judgment of this court is final and binding. Finally, the *Committee of Governors of Central Banks*, is responsible for the development of programs and action plans in the field of finance and monetary cooperation and, in general, for monitoring and ensuring the implementation of the provisions of the Treaty relating to Monetary and Financial Cooperation.

3.3.1.3 COMESA/SADC Road Transport Facilitation Instruments

In order to facilitate road transport haulage certain instruments have been agreed upon. These include harmonized axle load limits and vehicle dimensions, as well as overload control. Clearly it is important that a consistent policy is followed to avoid excessive road damage. COMESA carrier licenses, transit plates, harmonized transit charges (HRTC) and High Frequency X-border Land Mobile Radio Communications Systems (HFX) are further initiatives.

The main reasons necessitating the implementation of the instruments are a lack of harmonized policies in the implementation of axle load controls, lack of sufficient equipment for monitoring axle loads in some member states and lack of sensitization of road users. Moreover, there is a lack of an appropriate institutional framework and an absence of training programs for persons involved in the management of weighbridges, a lack of standardization of the issuance of compliance certificates and of calibration procedures for weigh-bridge scales across the demarcated routes and an absence of reliable alternatives in some instances for the transport of heavy cargo loads. One solution may be the operation of weighbridges by the private sector. Lastly the lack of harmonization in road construction and maintenance policy is seen as a constraint.

3.3.1.4 Carrier Licenses and Transit Plates

The objective of the carrier license is to replace the various service permits required from hauliers in the region, therefore assisting in the liberalization of the regional trucking industry and the abolition of trucking monopolies and quotas. The improved utilization of trucks due to authorities in countries not having to issue road service permits, has lead to major cost savings. A road carrier license, obtained from the licensing authority where the road haulier is resident, is valid for 12 months, and is paid for in local currency. The COMESA member

states agreed and implemented the carrier license. The concept of transit plates has not shown much progress.

3.3.1.5 HRTC

The objective of HRTC is to replace the multiplicity of road charges and licenses, often implemented on an ad hoc basis, with a clear-cut system intended to recover the cost of roads from road users. Uniform rates have been discussed and some countries in the region have gazetted and implemented them. Mozambique, Tanzania and the SACU countries do not subscribe to these rates as yet, however, and further discussions are taking place (e.g., SACU meeting in Windhoek 25 to 26 September 2001).

3.3.1.6 Yellow Card Scheme

The Yellow Card is a motor Insurance Card or Certificate recognized by member countries party to the Scheme, which guarantees that the motorist to whom it has been issued has insurance which complies with the Compulsory Third Party Insurance requirement of the country which he/she is visiting. It is an equivalent of a policy of Insurance issued in accordance with the Compulsory Motor Third Party Insurance laws of the country. For a party in whose territory insurance is not compulsory by law, the guarantee provided by the Yellow Card corresponds to the third party liability on the motorist in accordance with the laws and regulations in force in the country where the accident occurred.

The Yellow Card Scheme, which has been in operation for more than 13 years, is a vast improvement over previous systems: Motorists travelling in the region had to take out third party motor insurance cover for every country visited. In general, motor insurance policies specifically excluded liability outside the jurisdiction in which they operate. Hence, a motorist crossing borders was often faced with the inconvenience and extra expense of having to take out fresh insurance at each border crossed. Some of the member states that are party to the Scheme are Malawi, Tanzania, Zambia and Zimbabwe. The scheme is administered by a network of National Bureaus, designated by each member government. Each National Bureau is responsible for the administration and control of the operations of the Scheme in its own country. The National Bureaus are multilaterally committed through an Inter-Bureaus Agreement and have reciprocal arrangements among themselves. At a regional level, the National Bureaus constitute a Council of Bureaus. The Council of Bureaus is the highest body to coordinate and supervise the legal, administrative and financial operations of the National Bureaus and the Yellow Card Scheme. The COMESA Secretariat is the Interim Secretariat for the Council of Bureaus.

Perceived advantages of the scheme are that it is inexpensive. The Yellow Card Insurance cover is much cheaper than any other form of motor third party risk insurance cover and it is economical as it avoids delays, inconveniences and extra expenses. It enables motorists and travelers to save time and unforeseen expenses, for they do not have to stop and queue at every border post for the purpose of buying insurance cover. In addition it enables motorists to save hard currency. As it is available from local insurers in local currency, motorists and member States are able to save the scarce foreign exchange which would otherwise have been

used for purchasing insurance cover at border entries. Furthermore, it provides additional third party liability for property damage and extra benefit for emergency medical treatment expenses to travelling motorists and passengers and it enhances efficiency in transport. Motorists involved in accidents are only required to report the accident to the National Bureau and the Traffic Police of the country visited. They are free from detention and are at liberty to proceed with the journey as long as their vehicles are roadworthy. This has increased efficiency in transport; and has also relieved Embassies, High Commissions and Foreign Missions from being involved because insurers also benefit. It is a simple and economical mechanism to operate. Insurance companies are able to cater for the claims of their customers travelling through the National Bureaus and it provides business. Yellow Card insurers collect up to US$ 550 000 annually from the Yellow Card business. Lastly, it provides a forum for insurers to discuss issues of common interest. An achievement in this regard include the establishment of the PTA Reinsurance Company (ZEP-RE) which is the brain child of the Council of Bureaus on the Yellow Card Scheme; and it provides the opportunity for Insurance Companies to explore and expand business in the region.

3.3.1.7 ASYCUDA, EUROTRACE AND RHCTSS

ASYCUDA is UNCTAD's **A**utomated **SY**stem for **CU**s**t**oms **DA**ta and Management and the software is provided free to the member states through the COMESA regional center. EUROTRACE is a computer system for the collection and analysis of external trade statistics, and was devised by the European Community's Statistical Office (Eurostat). The ASYCUDA system is a computerized Customs management system, which also covers foreign trade procedures. It handles Manifests, Customs declarations, accounting procedures, warehousing, licenses and transit. It also generates reliable and timely trade data. In countries where it is already installed, ASYCUDA has sharply reduced the time it takes to clear goods through Customs.

Both ASYCUDA and EUROTRACE have been installed in Malawi, Namibia, Tanzania, Zambia and Zimbabwe. The ASYCUDA-EUROTRACE project came to an end on 31st December 1999 and a successor project under the name "Regional Harmonization of Customs and Trade Statistics Systems" (RHCTSS) started at the beginning of 2000. Management of the project, whose goal is to consolidate the gains made under the ASYCUDA-EUROTRACE Project, and to assist COMESA in preparing for the Customs Union in 2004, has been entrusted to staff from COMESA member States.

Progress so far is that baseline surveys have been undertaken. A stakeholder mobilization meeting has been held and a project steering committee has also had a first meeting.

3.3.1.8 The COMESA/SADC Customs Document (COMESA/SADC CD)

COMESA/SADC CD is a customs declaration document that is expected to replace existing customs declaration documents. Use of the COMESA-CD for imports/exports, transit and warehousing is expected to significantly speed up customs clearances and reduce the cost of documentation. It will help to reduce delays at border posts because there will no longer be a need to process different documentation. As a result of many countries waiting for

development of computerization of the process, progress has been slow. Zimbabwe, Zambia, Tanzania and Namibia have introduced the system, but Malawi and Botswana are still in the process of finalizing arrangements.

3.3.1.9 Regional Customs Guarantee Scheme (RCBG)

RCBG is designed along the principles of an ATA Carnet, but with a regional guarantee chain in the form of a regional bond. This would eliminate the opening and cancellation of bonds for each country transited. Large amounts of money currently being tied up will become available, generally to increase the effectiveness of transport in the region. Both COMESA and SADC have accepted the principle of the instrument, and five member countries have implemented it.

3.3.1.10 Advanced Cargo Information System (ACIS)

ACIS is a computer based transport logistics information system which provides advance, current and even past information to providers and users of transport services. This information can also be available to various other parties such as agents of providers and users and others such as banks and insurance companies who may have indirect interest in the cargoes transported or vessels and vehicles employed in the movement of the cargoes. It provides a record of what actually happened to cargo and equipment after each sector took up the possession and control of that cargo.

ACIS currently consists of the three modules:

- PortTracker, which is the application system employed in the maritime ports;
- RailTracker, which is the system employed in the railways and is being installed in the railway organizations in the subregion; and
- Backbone Information System (BIS). It is intended that all the ACIS applications will be linked up throughout the COMESA region using the Backbone Information system (BIS). The BIS will enable all the operators, and the ANEs to access information from the subregion to enable wide integration of the transport activities. National and subregional institutions will also be able to access information from the BIS.

Phase I, which is the current one, covers six countries, inter alia Tanzania and Zambia. It was financed by a grant from the European Union (EU) under the framework of regional funds of the 7th EDF of the Lome IV Convention. The United Nations Conference on Trade and Development (UNCTAD) was engaged as the Consultant and COMESA was the contracting authority. UNCTAD handled development and installation of the software and provide basic training. COMESA, through the subregional support team provides Coordination, Establishment of National and Subregional Databases, Software Maintenance, Management Training and Institutionalization.

At the Council of Ministers' meeting that took place in October 1999, the following progress was reported (only that relating to the study area is noted):

- RailTracker: software had been developed and installed in Tanzania Railways, Zambia Railways, and TAZARA;
- VSaT, enabling the Tanzanian and Zambian sections of TAZARA to be interlinked, had been installed.
- PortTracker: software in all modules had been completed, but had only, as yet, been installed in the port of Dar es Salaam

3.3.1.11 Road Safety Development Program

The US government funded a study to update the status of the road safety situation in Africa and a joint COMESA/SADC task force is to be instituted to guide implementation of the road safety program when implementation commences.

3.3.1.12 Maritime and Inland Water Transport Program

The Secretariat has to ensure that the Region utilize the IMO training programs and packages more effectively in order to secure better skills for both operators and regulators in the shipping industry.

3.3.1.13 Common Air Transport Policy/Liberalization of Air Transport

The COMESA Air Transport Liberalization program derives from the Yammoussokro Decision to liberalize the air transport services continent wide by eliminating the barriers which are entrenched through the system of bilateral air services agreements.

In 1999, a Working Group had been set up to work out modalities for the establishment of a COMESA Air Transport Regulatory Board. Some of the more urgent of these modalities are administrative and institutional arrangements, legal issues, fares and rates, code sharing, competition, franchising, computer reservation system, security and safety oversight; and dispute settlement mechanism. In the meantime, an Interim Air Transport Regulatory Board was established by the Council of Ministers. Procedures to be observed during approval/authorization of intra-COMESA airlines to operate in the Region were also decided at this meeting. Responsibilities until such time that the structure of the Regulatory Board had been finalized, were defined. Implementation of the liberalized internal (intra-COMESA) air transport services is currently taking place in a most of the states and substantial increases in the number of intercity frequencies have been recorded. Also the fair fares and air freight charges have declined due the competition.

3.3.1.14 The Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) Project

An initial feasibility study determined that regional implementation of the System was both technically and financially feasible. Further work is, however, still needed on financial, institutional, legal and regulatory issues, taking especially the following into account security and sovereignty of space, control and ownership of the system, investment already made in similar systems, location of Area Control Centers, coordination and harmonization of similar

studies or other subregional organizations, and state of conflict involving some states within the region. As agreed by the First Meeting of the Aeronautical Authorities/Directors of Civil Aviation, in July 1999, the Secretariat had prepared a draft MoU for signature between SASG and member states and circulated it for comments. The draft MoU with amendments was signed by the Ministers at the October 1999 Council of Ministers meeting. At the October 1999 Ministers' council meeting, it was acknowledged that each ICAO Contracting State should have both a National Air Transport Committee and an Airport Facilitation Committee. An Air Transport Facilitation / Security Committee was therefore established. The general objective of the Protocol is to establish transport, communications and meteorology systems which provide efficient, cost-effective, and fully integrated infrastructure and operations, which best meet the needs of customers and promote economic and social development, while being environmentally and economically sustainable. Implementation of the Protocol is facilitated by the development of annexes, guidelines, and model legislative provisions, which form an integral part of the Protocol.

3.3.2 Initiatives by SADC/SATCC

3.3.2.1 The SADC Protocol: Objective and Structuring

In August 1996 the SADC Protocol on Transport, Communications and Meteorology was signed by the heads of state and government. It came into force on July 6, 1998. This protocol forms the heart of SADC. The general objective of the protocol is to establish transport, communications and meteorology systems which provide efficient, cost-effective, and fully integrated infrastructure and operations, which best meet the needs of customers and promote economic and social development, while being environmentally and economically sustainable. Implementation of the Protocol is facilitated by the development of annexes, guidelines, and model legislative provisions, which form an integral part of the protocol.

Three annexes which have been agreed upon (1999) namely, Annex 1: Common Definition of SADC Regional Trunk Roads and Common Route Numbers (the SADC Regional Trunk Route Network was incorporated in the Protocol in 1998), Annex 2: Harmonized Codes and Format for Driving Licenses, and, Annex 3: Establishment and Management of the SADC Permanent Mission to the International Civil Aviation Organization (ICAO).

Eight model legislative provisions (MLPs), which are specific guidelines on the manner in which entities or policies should be created and managed, have also been developed on: Investment in Transport, Commercial Ports, Maritime and Inland Waterway Authorities, Road Network Financing and Management. This includes the concepts of concessioning and user pays and includes guidelines on the bringing about of roads boards, roads authorities and road funds), Provision of Air Services, Airports, Air Traffic and Air Navigation Services and Civil Aviation Authorities.

Two model agreements are also in place, (i.e., Model Telecommunications Policy, and Model Bilateral Agreements on Road Freight and Passenger Transport). Member states are at different stages of implementing these guidelines and MLPs into their national legislation and practices.

Two further legal packages, focused mainly around MLPs, have been agreed upon in principle, but are still being processed for final approval, (i.e., Border Post Reform and Vehicle Overloading Control).

Guidelines still under preparation or have yet to be agreed upon are those on Railway Restructuring and Regulation (Concessioning), as well as those contained in the following documents: The Model Concession Contract for the Provision and Operation of Railway Infrastructure, the Model Concession Contract for the Provision and Operation of Port Terminals and Facilities, leasing Contracts, and the Technical Harmonization and Standardization Manuals.

3.3.2.2 Protocol Implementation Institutional Framework - Mechanisms at Regional Level

Frameworks and mechanisms were developed to facilitate implementation of the Protocol at regional level. These are in three graphs:

- *Regional Subsectoral Committees* (SCOMs), comprising private and public sector partners from private, governmental, regulatory, service provider, user/consumer, and labor sectors. Core voting members consist of official national delegates, led by a designated senior official in charge of policy matters in the relevant subsector. Other participants are expected to provide consultative input from the various subsectors. These Committees each address issues within a specific sector, e.g., transport or roads, within the region;
- *Corridor Planning Committees* (CPCs) who undertake planning with regards corridors. Corridor issues may include commercial and other developments, harbor activities, the flow of goods, competitive advantages of the corridor, etc. An example of a corridor is the Beira Corridor;
- *Route Management Groups* (RMGs) are in many ways similar to CPCs, but address problems specific to a defined transport route. An example of such a route may be the road between Johannesburg and Beit Bridge;
- Airport Facilitation Committees (AFCs); and
- A SATCC-TU reorganization committee to cope with the new Protocol mandate and challenges.

3.3.2.3 Protocol Implementation Institutional Framework - Mechanisms at National Level

In addition to the above, the Protocol Implementation Institutional Framework also consists of certain mechanisms at national level:

- *National Protocol Implementation Teams* (N-PICTs), which comprises national coordinators and/or their deputies. The function of these teams are to see to the implementation of Protocol policy in the member country;
- *Core Subsectoral Groups*, consist of stakeholders from private, governmental, regulatory, service provider, user / consumer, and labor sectors, and led by subsectoral coordinators. Whereas N-PICTS are responsible for implementation of overall policy,

subsectoral groups overseas the implementation of subsector specific, e.g., roads or inland waterways, decisions;

- *National Protocol Implementation Workshops* (NIPWs), combine key stakeholders from the above subsectors;
- *Micro Action Plans (MICAPs).* These go through a process of establishment, implementation, monitoring, and progress reporting. Efficient Protocol implementation progress monitoring is expected to be achieved through quarterly reporting on the implementation of consolidated MICAPs. All countries that have developed and submitted MICAPs received some assistance from SATCC, through the USAID-financed STEP project; and
- National Legal Reform Teams.

3.3.2.4 Implementation of Protocol Institutional Framework Mechanisms at Regional Level

Progress to date is as follows: The new structure of SATCC-TU has been approved and is to be phased in over the period 2000-2002. Various RMGs exist in the region, but they need to be strengthened. Although CPCs do not currently exist, they might develop from existing transport or corridor development groups or from RMGs.

SCOMs are in their infancy, mostly as a result of weak input from consultative members. They have so far been driven largely by service providers and industry professionals. According to PAAS (Policy Analysis Assistance to SATCC), for the SCOMS to become fully functional, the following surface transport and transport-related regional bodies need to be formed, transformed or strengthened: the existing Federation of Regional Road Freight Associations (FRRFA). (The Federation currently is a consultative member of the ROADS SCOM); the existing Federation of Clearing and Forwarding Agents of Southern Africa (FCFASA). (The Federation is currently a consultative member of the Maritime SCOM), the existing Southern African Railways Association (SARA). (SARA has applied for membership of the SATCC Railway SCOM); a regional customs forum; a regional association of road agencies. The American Association of State Highway and Transport Officials (AASHTO) and the US Federal Highway Administration (FHWA) have agreed to assist in the formation and early development of such an association; a regional association of road contractors and the road construction equipment leasing industry; an association of chambers of commerce; and a regional association of national shippers' councils.

It is crucial that waterway management entities, none of which currently exist in the region, should be formed.

In addition to the progress described above, the following progress has been made in the implementation of the National Protocol Objectives: member states approved the process of road transit charges in 1999, but it took long to calculate harmonized charges. An implementation manual is currently being produced; road design standards are currently being reviewed; technical work on the harmonization of road signs and signals has been completed, but still needs to be formalized; road safety issues are being addressed on a corridor base, starting with the Beira Corridor; harmonized customs procedures and documentation is being documented and the concept of one-stop border posts developed; an MoU between member

states has called for the creation of an integrated network of weigh stations, the creation of a region vehicle overload control association (REVOCA), and for regional associations. REVOCA held its inaugural meeting, at which a number of decisions regarding the institutional, management and implementation issues of regional vehicle overloading were taken; introduction of a new reporting format of rail corridor performance indicators by the Corridor Management Groups; decisions have been made as to the routing of regional rail traffic; a SADC Railway Rolling Stock Information System (RSIS) project, funded by USAID, is being implemented; the Inland Waterways Subcommittee of the SATCC Maritime and Inland Waterways Committee was formed with the objective of addressing the use of SADC major waterways for transport purposes; all countries bordering inland waterways are signatories to the basic International Maritime Organization Conventions dealing with safety; although little progress has been made in regional cooperation between airlines, bilateral agreements manage to ease traffic right restrictions to some extent; development of the SATCC Information System.

3.3.2.5 Implementation of Protocol Institutional Framework Mechanisms at National Level

All member states have N-PICTs in place, and the following countries have submitted MICAPs: Angola, Botswana, Malawi, Mauritius Mozambique, Swaziland, Tanzania, and Zimbabwe. Only Tanzania has submitted a comprehensive MICAP implementation progress report. Continued assistance to N-PICTs, especially with regards to establishment of the reporting mechanism, is needed.

In most countries, the private sector is yet to become an effective partner. None of the member states have passed generic legislation for private sector investment in public infrastructure, in spite of assistance given in the form of *inter* alia the model 'Investment in Transport Act', which forms part of the Policy Analysis Assistance to SATCC-TU (PAAS) of the SADC Transport Efficiency Project (STEP).

In addition to the above, some progress has been made in the implementation of the National Protocol Objectives, especially with regards to the following: concessioning, restructuring and privatization of railways; establishment of roads boards, dedicated road funds, and autonomous roads agencies; concessioning of ports and restructuring of ports management structures; privatization of maritime shipping operations; forming of autonomous civil aviation authorities; development of a strategy for vehicle overloading; and development of a strategy preventing unnecessary delays at border posts.

The information system's basic purpose is to enable SATCC-TU to maintain and continuously update and keep track of both adequacy information, regarding all aspects of the region's transport, communications, and meteorological services; and implementation and impact information.

Although progress had been made in the implementation of SATCC-TU internal processes and hardware installation, regional successes are still very limited.

SATCC Website and Information Database. Basic hardware and software required for SATCC-TU networking has been installed, enabling experts to share network resources and exchange information internally and externally, basic routines for operating statistical data bases are being refined, and manuals detailing use and maintenance of databanks have been compiled and are being updated as required.

SATCC-TU Library. Funding is still being sought to automate the library, and to add technical reference materials to the library. A number of brochures and booklets covering subjects such as 'railway restructuring and concessioning' have been published.

3.3.2.6 Transport and Communications Integration Study for Southern Africa

Although the Protocol and its implementation institutional framework forms the central part of SADC's policy structure, a number of other studies have shaped restructuring in Southern Africa. One of the most important of these is the Transport and Communications Integration Study for Southern Africa, carried out for SATCC and funded by the European Commission (EC).

3.3.2.7 Association of Southern African National Roads Agencies (ASANRA)

ASANRA was established on 19 March 2001 and consisted of representatives of national road agencies, educational institutions, industry/private sector and other interested parties designated by the Board of Directors. The Board consists of CEOs for each road agency / authority / relevant government official.

ASANRA focuses on the identification and harmonization of best practice regarding standards. This includes overload control, harmonized axle load limits, design guidelines, implementation of the SATCC roads and bridges specifications and codes of practice; Encouraging the development and harmonization of road management systems and production of guidelines on such management systems; Implementation of harmonized road user charges and production of guidelines for such implementation; and promotion and piloting of the one-stop border post concept. A President, Vice President and Executive Director officiates, whereas the Executive Committee consist of a President, a Vice President and 3 representatives from standing committees.

It has the following standing committees:

- Network Management and Financing (chaired by Botswana);
- Material and Design Standards (chaired by Tanzania);
- Safety (chaired by Namibia);
- Construction and Maintenance (chaired by Mozambique); and
- Research and Development (chaired by South Africa).

A first Board of Directors meeting was held in Harare, Zimbabwe, on 7 May 2001. At this meeting, it was decided that a business plan is to be drawn up based on four focus areas; a Regional Technology Transfer Center is to operate under the Standing Committee on

Research and Development; FHWA is to make US$10,000 for operation during the first two years; USAID may also support programs under the Regional Technology Transfer (T^2) Center on request. A first executive meeting was held in Windhoek, Namibia, on 15 August 2001. The purpose of the meeting was to develop terms of reference for the Standing Committee on Research and Development, to develop terms of reference for the Business Plan, and to make provision for the establishment of a Regional Technology Transfer Center. Outcomes of this meeting were that terms of reference of the R&D Committee were approved. Work would commence on a logical framework, project ideas would be forwarded and a standing committee convened; Regional Technology Transfer Center: It would be permanently housed at the CSIR; it would not form part of R&D, but would be repackaged as a project plan; its functions would be standardized; and a consultant would be appointed to develop a business plan.

3.4 The New Africa Initiative 2001 (NAI)

The NAI 2001, which is a merger of the Millennium Partnership for the African Recovery Program (Map) and the Omega Plan, is a recent development with the potential to impact the whole of Africa. Many sectors, including transport, are to be addressed under this initiative. Objectives in the case of transport include:

- a reduction in delays in the trans-border movement of people, goods and services, and
- an increase in air passenger and freight linkages across African subregions.

It is important to note that the NAI is intended to provide an over-arching framework aimed at fast-tracking economic development on the continent, inter alia by attracting foreign investment to Africa coupled with a strategy to achieve good governance.

3.5 Some Concluding Comments

What can be seen from this chapter is that while there has been some good progress from the initiatives of COMESA and SADC (e.g., Yellow Card Scheme), in other areas progress has been pedestrian and there appears to be a lack of urgency (e.g., road transport harmonization policies). This appears to be because different countries have different resources and move at different paces and because in some instances there is a serious lack of implementation capacity. Not all individuals or bodies appear to understand the agreements reached and are themselves driven by parochial concerns such as “turf protection”. Input by the private sector is not significant in many cases. These comments, however, reflect perceptions. What is now necessary is to investigate more scientifically the reasons for uneven or limited success.

While there are many dedicated public servants who are sincerely trying to “make a difference”, they are not rewarded for speedy progress and operate within a relatively bureaucratic environment.

CHAPTER 4.
WEAKNESSES AND STRENGTHS OF PAST INITIATIVES

4.1 Introduction

This chapter quantitatively investigates the weaknesses and strengths of past initiatives, aimed at improving transport sector efficiency in southern Africa. The reasons for the uneven success of such initiatives (perceptive variables) are varied and require careful scientific analysis. In this chapter results of this investigation are presented and analyzed both statistically and, where appropriate qualitatively. Specific findings of the Harare workshop are also taken into account.

4.2 Survey Finding

An electronic survey was undertaken. This method of surveying respondents, primarily relied on questionnaires which were distributed electronically (e.g., email and/or fax). Further details of the survey methodology is presented in Section 6.1 and Appendix F.

4.3 Perceptive Variables

To determine the respondent's perceptions about each question being asked, perceptive variables were used to rank each modal response (these are the subquestions asked under each question [see Appendix E]). Each perceptive variable was ranked according to how much the respondent agreed with the statement.

Rank	Score
Strongly agree	4
Agree	3
Disagree	2
Strongly disagree	1

From the above, it becomes evident that the higher the mean score the more strongly the respondent agreed with the perceptive variable. For a detailed listing of each of the perceptive variables based on Question 3 of the questionnaire (i.e., constraints), the reader is referred to Appendix E.

4.4 Questionnaire Analysis

For a detailed description of the statistical methodology used in analyzing the data the reader is referred to section 1.6 and Appendix F. The actual analysis conducted comprised of:

- Deriving the arithmetic mean (i.e., average) of a group of observation
- Deriving the standard deviation
- Analysis of the Variance (ANOVA)

4.5 Constraints to Implementation

This section presents a statistical analysis (by mode) of the results from the electronic survey. Responses here were based on Question 3 of the questionnaire (see Appendix E). The primary purpose of the tables presented in this section is to present the ranking of perceptive variables (constraints) derived from the questionnaire responses. In other words, the tables are trying to show, how strongly (in agreement or in disagreement) the respondents rated each of the statements made.

In order to better understand the ranking of the perceptive variables, the reader is referred to Appendix F to gain the definitions of the mean, standard deviation and analysis of variance as discussed in this chapter.

4.5.1 Road Transport

Table 4.1 presents the mean scores and standard deviations of the perceptive variables as ranked by respondents from the road industry. The scores are ranked according to the order of magnitude of the mean.

Table 4.1: Ranking of Variables Impacting on the Limited Implementation of Recommendations – Road Sector

Rank	Constraints	Mean	Std Dev
1	Implementation capacity within governments	3.45	0.80
2	Harmonization of legislation and policies	3.36	0.79
3	Translation of model legislation and policies into national frameworks	3.33	0.84
4	Insufficient resources (tech & fin)	3.27	0.70
5	Insufficient consultation/coordination at national and regional level	3.18	0.66
6	Different stages of socioeconomic development	3.14	0.71
7	Insufficient involvement of all stakeholders	3.09	0.61
8	Inadequate dissemination and application of research information	3.09	0.68
9	Inadequate monitoring mechanisms	3.05	0.84
10	Lack of business focus at government level	3.05	0.72
11	Lack of stakeholder commitment	3.00	0.76
12	External influences	3.00	0.53
13	Inadequate supporting structures and synchronization	2.91	0.81
14	Institutional gaps	2.86	0.56
15	Lack of advocacy	2.86	0.56
16	Political instability	2.82	0.73
18	Vested interests, sovereignty and nationalism	2.73	0.83
17	Low level of awareness of regional activities	2.73	0.88
19	Ad hoc changes in government policy	2.68	0.78
20	Insufficient working/viable examples	2.45	0.80

Table 4.1 indicates that respondents from the road sector agreed most strongly with the perceptive variable, 'the level of implementation capacity within governments', as being the most important constraint of all the perceptive variables suggested. On the other hand, road

respondents disagreed most strongly with the perceptive variable, 'insufficient working/viable examples.' In other words, respondents from this sector perceived that, there are a number of working/viable examples in the transport environment in the region, but it is only the dissemination of information regarding these examples that is lacking.

Key statistical points arising from Table 4.1 can be listed as:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 4.1 is indeed statistically robust.

Two key qualitative points arising from Table 4.1 can be listed as:

Resource (financial and human) limitations within Government Structures

Rankings, in positions 1 to 4, by the road sector respondents, allude to the fact that, many private sector transport operators are dependent on government structures in facilitating development and growth within the road transport industry (especially when these operators are operating in a regional/international environment). If this facilitation is not being realized, it is in some part due to the limited resource capacity within government structures. In other words, the rankings confirm the perceptions amongst the private sector that government departments are constraining progress.

For example, in some of the study countries, transport departments/ministries do not have the necessary human resource and technical capacity and were therefore limited to engaging consultants to assist in departmental obligations. It can be concluded that the level of institutional capacity, within some government departments, is limited and needs to be urgently reassessed. There is a desperate need to re-examine the human resource capacity in many implementing agencies in order to implement recommendations effectively.

Lack of Involvement of all the Role-players

The road freight sector, of all the transport sectors in the study region, has the largest number of players. This is partly because in the study region, the road freight sector is primarily driven by private sector operators. The ranking in the fifth position of the insufficient involvement/consultation of stakeholders in the industry, is a cry by the industry for greater involvement in facilitating economic development (in partnership with governments) through transport in the region.

All stakeholders should be involved in the process of resolving transport problems in the region. Thus there is a need to identify the relevant stakeholders and involve them in the process. Stakeholders, such as the inland revenue, immigration authorities, etc., which may at first be thought to have little interest in transport, play a key role in the total transport/supply chain (especially at the border crossings). The Ministries of

Transport can only facilitate the process of improving the transport environment; for this to happen in a sustainable fashion, all stakeholders must buy-in to the process through active and continuous consultation.

4.5.2 Air Transport

Table 4.2 gives the mean scores and standard deviations of the perceptive variables as ranked by respondents from the civil aviation industry. The scores are ranked according to the order of magnitude of the mean.

Table 4.2: Ranking of Variables Impacting on the Limited Implementation of Recommendations – Civil Aviation Sector

Rank	Constraint	Mean	Std Dev
1	Insufficient resources (technical and financial)	3.50	0.58
2	Implementation capacity within governments	3.50	0.58
3	Vested interests, sovereignty and nationalism	3.50	0.58
4	Different stages of socioeconomic development	3.50	0.58
5	Harmonization of legislation and policies	3.25	0.96
6	Insufficient involvement of all stakeholders	3.25	0.50
7	Inadequate supporting structures and synchronization	3.25	0.50
8	Institutional gaps	3.25	0.50
9	Translation of model legislation and policies into national frameworks	3.00	0.82
10	Inadequate monitoring mechanisms	3.00	0.82
11	Low level of awareness of regional activities	3.00	0.82
12	Lack of stakeholder commitment	3.00	0.82
13	Lack of business focus at government level	3.00	0.82
14	Lack of advocacy	3.00	0.82
15	Insufficient consultation/coordination at national and regional level	3.00	0.82
16	Inadequate dissemination and application of research information	3.00	0.82
17	Insufficient working/viable examples	2.75	0.96
18	External influences	2.75	0.50
19	Political instability	2.75	0.50
20	Ad hoc changes in government policy	2.50	0.58

Table 4.2 indicates that respondents from the civil aviation sector agreed most strongly with the perceptive variable, 'insufficient resources (both technical and financial)', as being the most important constraint of all the perceptive variables suggested. (This in many ways is to be expected as the civil aviation sector is very capital intensive). On the other hand, respondents from the civil aviation sector disagreed most strongly with the perceptive variable, '*ad hoc* changes in government policy.' In other words the respondents from this sector perceived that, ad hoc changes in government policy is the least important perceptive variable that influences the civil aviation sector in the region.

Key statistical points arising from Table 4.2 are:

- There were only five questionnaires for Question 3 of air transport, which is too small a sample size to properly carry out significance tests.
- The tests indicated no significant difference between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F.)
- The lack of any significant differences between the means confirms that the ranking as contained in Table 4.2 is indeed statistically robust.

Two key qualitative points arising from Table 4.2 can be listed as:

Capital Intensity

Of all the transport modes in the region, the civil aviation industry has the largest capital needs, both in terms of finance, human resources (remuneration and technical) and equipment. The number of organizations involved in civil aviation in the region are not justified by the revenue generated from the traffic (both passenger and freight) available. The continuous need to keep abreast of institutional developments, e.g., new aircraft, technical advances, necessitates that airlines based in the study region, have ongoing capital needs that are dictated by external forces.

Nationalism

Each country in the study region still wants to maintain its unique identity and sovereignty. Countries want to hold on to their infrastructure and regional responsibility and this impacts on the effectiveness of regional integration/coordination. Rather than reaching towards the Yamoussoukro Declaration (open skies), many countries are still holding to bilateral agreements. From the interview conducted amongst civil aviation stakeholders, there is the perception that local issues within each member state take higher priority than regional issues despite the agreement of the protocol.

4.5.3 Marine/Inland Water and Port Transport

Table 4.3 gives the mean scores and standard deviations of the perceptive variables as ranked by respondents from the marine/inland waterway and port industry. The scores are ranked according to the order of magnitude of the mean.

Table 4.3: Ranking of Variables Impacting on the Limited Implementation of Recommendations – Marine Sector

Rank	Constraint	Mean	Std Dev
1	Harmonization of legislation and policies	4.00	0.00
2	Insufficient resources (tech & fin)	3.50	0.71
3	Inadequate monitoring mechanisms	3.50	0.71
4	Lack of business focus at government level	3.50	0.71
5	Different stages of socioeconomic development	3.50	0.71
6	Lack of advocacy	3.50	0.71

Rank	Constraint	Mean	Std Dev
7	Implementation capacity within governments	3.00	1.41
8	Ad hoc changes in government policy	3.00	1.41
9	Translation of model legislation and policies into national frameworks	3.00	0.00
10	Low level of awareness of regional activities	3.00	0.00
11	Inadequate supporting structures and synchronization	3.00	0.00
12	External influences	3.00	0.00
13	Insufficient consultation/coordination at national and regional level	3.00	0.00
14	Insufficient involvement of all stakeholders	2.50	0.71
15	Lack of stakeholder commitment	2.50	0.71
16	Institutional gaps	2.50	0.71
17	Political instability	2.50	0.71
18	Insufficient working/viable examples	2.50	0.71
19	Inadequate dissemination and application of research information	2.50	0.71
20	Vested interests, sovereignty and nationalism	2.00	1.41

Table 4.3 indicates that respondents from the marine/ports sector agreed most strongly with the perceptive variable, 'harmonization of legislation and policies', as being the most important constraint of all the perceptive variables suggested. On the other hand, respondents from the marine/ports sector disagreed most strongly with the perceptive variable, 'vested interests, sovereignty and nationalism.' In other words the respondents from this sector perceived that, vested interests, sovereignty and nationalism,; is the least important perceptive variable that influences the marine/ports sector in the region.

Key statistical points arising from Table 4.3 are:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 4.3 is indeed statistically robust.

Two key qualitative points arising from Table 4.3 can be listed as:

Legislative Environment

The lack of appropriate legislation and differences in legal/policy instruments between member states has impacted on the efficiency that can be achieved by the transport operators in the region.

The different legal environments impact in a variety of ways, for example, in the case of member states having differing legal axle load weights, vehicles transiting a number of countries on a journey may be operating at optimal level in one state and suboptimal in another (due to the fact they may have to reduce the weight of cargo being carried to comply with the axle load standards in the state being transited). In turn, the axle loading permitted along a transport corridor can determine which port of exit/entrance is used in the supply chain. Certain ports, through no fault of their own, are therefore

hindered in attracting all potential cargoes that could utilize their facilities, due to axle load limits within their country or in neighboring member states.

Lack of Monitoring Mechanisms

A number of port stakeholders interviewed felt that there was a lack of (or did not know of) a monitoring agency/authority tasked with assessing the level of implementation or performance management of the implementation process. In some cases respondents felt that this task was the responsibility of the SATCC, and others that the responsibility lay with the Ministry of Transport in each of the member states. The limitation in the level of monitoring mechanisms in certain member states, gives rise to transport developing in ways that may not be beneficial to the region as a whole, e.g., not adhering to the shortest route principle, which in turn influences which of the regional ports is used in the supply chain.

4.5.4 Pipeline Transport

Table 4.4 gives the mean scores and standard deviations of the perceptive variables as ranked by respondents from the pipeline industry. The scores are ranked according to the order of magnitude of the mean.

Table 4.4: Ranking of Variables Impacting on the Limited Implementation of Recommendations – Pipeline Sector

Rank	Constraint	Mean	Std Dev
1	Inadequate monitoring mechanisms	3.33	1.15
2	Inadequate dissemination and application of research information	3.33	0.58
3	Insufficient consultation/coordination at national and regional level	3.33	0.58
4	Insufficient resources (tech & fin)	3.00	1.00
5	Low level of awareness of regional activities	3.00	1.00
6	Translation of model legislation and policies into national frameworks	3.00	0.00
7	Vested interests, sovereignty and nationalism	3.00	0.00
8	Inadequate supporting structures and synchronization	3.00	0.00
9	Different stages of socioeconomic development	3.00	0.00
10	Lack of stakeholder commitment	2.67	1.15
11	Ad hoc changes in government policy	2.67	1.15
12	Insufficient involvement of all stakeholders	2.67	0.58
13	Implementation capacity within governments	2.67	0.58
14	Lack of business focus at government level	2.67	0.58
15	External influences	2.67	0.58
16	Harmonization of legislation and policies	2.67	0.58
17	Institutional gaps	2.33	2.08
18	Political instability	2.33	0.58
19	Lack of advocacy	2.33	0.58
20	Insufficient working/viable examples	2.00	1.00

Table 4.4 indicates that respondents from the pipeline sector agreed most strongly with the perceptive variable, 'inadequate monitoring mechanism', as being the most important constraint of all the perceptive variables suggested. On the other hand, respondents from the pipeline sector disagreed most strongly with the perceptive variable, 'insufficient working/viable examples.' In other words, respondents from this sector believe that, there are a number of working/viable examples in the transport environment in the region, but it is only the dissemination of information regarding these examples that is lacking.

Key statistical points arising from Table 4.4 results:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 4.4 is indeed statistically robust.

Two key qualitative points arising from Table 4.4 can be listed as:

Limited Dissemination of Research Findings

A number of studies have been conducted on transport costs within the Southern African region, but failure to disseminate the results of such studies has hindered the application of recommendations emanating from this research. Pipeline stakeholders noted that the benefits of transporting hazardous liquids, e.g., fuel, by pipeline offers unique advantages (especially those relating to the environment) that may not be known by policymakers. It was, therefore, suggested by pipeline stakeholders interviewed that policymakers need to be advised of the findings of transport research being conducted in the region in order to determine transport strategies that are appropriate for the local environment.

Low Level of Awareness

Continuing from the above, the level and extent of dissemination of information correlates well with the level of awareness about a particular issue. However, there are still obstacles with respect to regional transport players being made aware that all transport modes have a key role to play in developing the region, a major obstacle being, corporate secrecy due to the perceived level of competition. The lack in the level of sharing information in turn impacting on the level of awareness, has impacted negatively on the level of investment in all transport modes in the region. In that investment may be skewed towards one particular transport mode, e.g., road, at the expense of other alternative transport strategies.

4.5.5 Railway Transport

Table 4.5 gives the mean scores and standard deviations of the perceptive variables as ranked by respondents from the road industry. The scores are ranked according to the order of magnitude of the mean.

Table 4.5: Ranking of Variables Impacting on the Limited Implementation of Recommendations – Railway Sector

Rank	Constraint	Mean	Std Dev
1	Insufficient resources (tech & fin)	3.14	0.90
2	Harmonization of legislation and policies	3.14	0.69
3	Vested interests, sovereignty and nationalism	3.00	1.15
4	Implementation capacity within governments	3.00	1.00
5	Lack of stakeholder commitment	3.00	0.82
6	Lack of business focus at government level	3.00	0.82
7	Institutional gaps	3.00	0.58
8	Different stages of socioeconomic development	3.00	0.58
9	Political instability	3.00	0.58
10	Translation of model legislation and policies into national frameworks	2.86	1.21
11	Inadequate monitoring mechanisms	2.86	0.90
12	Low level of awareness of regional activities	2.86	0.90
13	Inadequate supporting structures and synchronization	2.86	0.69
14	Insufficient involvement of all stakeholders	2.71	0.95
15	Ad hoc changes in government policy	2.57	1.27
16	External influences	2.57	0.53
17	Lack of advocacy	2.14	0.90
18	Insufficient consultation/coordination at national and regional level	2.14	0.90
19	Inadequate dissemination and application of research information	2.14	0.90
20	Insufficient working/viable examples	2.00	0.82

Table 4.5 indicates that respondents from the rail sector agreed most strongly with the perceptive variable, 'insufficient resources (both technical and financial)', as being the most important constraint of all the perceptive variables suggested. (This in many ways is to be expected as the rail sector is very capital intensive). On the other hand, respondents from the rail sector disagreed most strongly with the perceptive variable, 'insufficient working/viable examples.' In other words, respondents from this sector believe that, there are a number of working/viable examples in the transport environment in the region, but it is only the dissemination of information regarding these examples that is lacking.

Key statistical points arising from Table 4.5:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 4.4 is indeed statistically robust.

Two key qualitative points arising from Table 4.5 can be listed as:

Lack of Business Focus

In most of the member states governments are the primary drivers of economic development (even though there is a concerted shift towards the private sector). The

lack of business focus of many government departments/ministries (and transport utilities which in the past operated under public management) has influenced the level of implementation of protocols. The level funding available in the public domain is becoming lower and lower and therefore parastatals must become more business-focused (make money). In fact, some parastatals are changing very rapidly in that they have to declare dividends to government.

Lack of Stakeholder Commitment

As one respondent stated, 'the real parties that should be implementing are the member states themselves and not the SADC/SATCC. If there is no seriousness on the part of each of the member states, implementation will stall.' Stakeholder commitment is a prerequisite for effective implementation.

4.5.6 Other Constraints

Other constraints (identified through personal interviews with stakeholders in the region) that have affected the level of implementation of recommendations can be listed as:

Institutional Gaps

Many of the respondents from the private sector felt that there was still a gap between the political and operation levels. It was noted that recommendations were made at a political level, but implemented at an operational level. It was in the translation of the political directive to the operational level through the implementation process that problems would arise.

Lack of Working/Viable Examples

Lessons can be learned from success stories. Unfortunately, in the region it is being argued that there are few if any working examples of implemented recommendations. For example, the rail concessioning process has been dropped in some countries for the reason that there is no example within SADC. Another argument that is raised is that if there is a working example, the conditions in which it is working are unique to that operation and therefore may not apply to another.

Lack of Supporting Structures and Synchronization/Coordination

A number of bilateral agreements have been signed between member states. In order for these bilateral agreements to be implemented fully, supporting structures also need to be in place. It was the creation of policy for the Roads Bill that slowed the process down, by one to two years.

In one example, the restructuring of the roads department involved a number of stakeholders, the coordination of which would take time. The rate at which the reformation of the road department took place was primarily dependent on the

legal/parliamentary processes. The establishment of a supporting infrastructure that is focused on service delivery can help minimize the extent of delay in implementation.

Some respondents noted that there was a lack of coordination between countries in a variety of aspects and this too impacted on the lack of implementation.

Vested Interests

One respondent noted that the pace of implementation was very slow due to the resistance to change arising from the perceived potential loss of income for vested interests in the current (inefficient) environment. The safeguarding of these interests took priority over the improvement of transport costs.

Level of Lobbying

Private sector lobbying in many of the member states is weak. This is partly due to the fact that the private sector in these states is still in its early stages of development. The lack of lobbying impacts the rate of decision-making in government. If the low number of local lobby groups is cause for concern, there are even fewer lobby groups that have regional 'clout' and this is even more of a problem.

Control Outside their Realm

The acceptance that some factors that influence transport costs in the region are beyond immediate control, e.g., foreign currency exchange rates, has in some cases resulted in stakeholders not rising to meet the challenge in managing the situation.

Change of Events

A number of stakeholders confirmed that in their countries some of the recommendations/guidelines have been overtaken by events. For example, some of these guidelines were compiled many years ago before there was a government policy on commercialization, restructuring, etc. Now there is a government policy on commercialization and restructuring of government departments, which has superseded the recommendations/guidelines in terms of their importance to the national economy.

Focus of Stakeholders Outside of the Region

One of the respondents in the civil aviation industry noted that air operators in the region, instead of cooperating with each other, are given to infighting. Most of the SADC airlines are very weak and are trying to get partners to ensure long-term sustainability. Nevertheless, instead of getting partners from within SADC, they are pairing up with non- African airlines. BA/Comair is an example.

Change Processes

Respondents agreed that new policies come into play, which result in the revoking of old policies. Nevertheless, effective change takes time, especially when taking into account the past socialist and capitalist ideals of some of the member states. The legacy of the past has a tight hold on the present in some of the member states, slowing down the grasp of new policies that can impact on transport costs.

Differing Stages of Development

It was noted that a number of recommendations have not been implemented due to the governments in the region being at differing stages of economic/social development. The pace of change is unique to each member state, which takes account of its own unique environment. The concept of local versus regional levels of development (and the subsequent impact on the rate of development) has to be accepted by all stakeholders.

4.6 Modal Ranking

Table 4.6 brings together responses from the five modes (as contained in Section 4.5).

Table 4.6: Ranking of Variables Impacting on the Limited Implementation of Recommendations – All Modes

Constraint/Perceptive Variable	Transport Mode				
	Road	Rail	Air	Sea	PipeL
Translation of model legislation and policies into national frameworks	3	10	3	9	6
Insufficient resources (Technical & Financial)	4	1	4	2	4
Insufficient involvement of all stakeholders	7	14	7	14	12
Implementation capacity within governments	1	4	1	7	13
Inadequate monitoring mechanisms	9	11	9	3	1
Vested interests, sovereignty and nationalism	18	3	18	20	7
Low level of awareness of regional activities	17	12	17	10	5
Lack of stakeholder commitment	11	5	11	15	10
Lack of business focus at government level	10	6	10	4	14
Inadequate supporting structures and synchronization	13	13	13	11	8
Ad hoc changes in government policy	19	15	19	8	11
Institutional gaps	14	7	14	16	17
Different stages of socioeconomic development	6	8	6	5	9
External influences	12	16	12	12	15
Political instability	16	9	16	17	18
Lack of advocacy	15	17	15	6	19
Insufficient working/viable examples	20	20	20	18	20
Harmonization of legislation and policies	2	2	2	1	16
Insufficient consultation/coordination at national and regional level	5	18	5	13	3
Inadequate dissemination and application of research information	8	19	8	19	2

4.7 Discussion of Results

This section will discuss and compare the ranking of the top three constraints/perceptive variables from the electronic survey as well noting specific results from the Harare workshop.

4.7.1 Ranking Correlations/Conclusions

What can we conclude from the ranking of perceptive variables as presented in Table 4.6?

Public versus Private Sector

Respondents representing the road sector were primarily from the private sector. This was not the case of the civil aviation and pipeline respondents, where most of the respondents came from organizations, e.g., government parastatals that still have a majority public shareholding. Comparison between the rankings of the transport modes shows clear differences between the responses of the public and private sector. The divergent responses expressed by public versus private sector respondents, does indicate the need for continued dialogue between government departments and the private sector in order to appreciate the problems and needs of each grouping.

Industry Specific

The assumption is made, that the ranking of perceptive variables by the respondents was primarily based on issues faced in their respective industries. In other words, the ranking by civil aviation respondents, focussed on issues affecting civil aviation, which are different from issues being faced in the road sector.

Within the southern African region each transport mode faces unique and different challenges within their operating environments. This in turn limits the effectiveness of generic interventions, but instead, requires mode specific interventions in order for each transport mode to operate effectively within their environment. For example, the move towards deregulating all transport modes simultaneously (through the translation of model legislation and policies into national frameworks) may not result in the ideal transport environment, as each transport mode may be at a differing level of operational readiness. This reason, offers an explanation to the ranking of perceptive variable A (Table 4.6), which varied from position 3 to position 10 in the transport mode rankings.

Sector Protective

Can it be assumed that respondents knowing the issues of their particular industry, ranked the perceptive variables in order to bring certain issues to the forefront of policymakers? This reason cannot be discounted, nevertheless, the limited sample size does not permit this hypothesis to be statistically tested. For example, respondents from the rail industry, represent railway companies that must operate in the international arena, as their local markets are very limited and not financially sustainable.

International railway operations within the region, are governed by agreements between two or more railway organizations. As a deregulated and open operating environment has not been developed within some member states in the region (with respect to rail operations), it is quite clear that many of the respondents placed vested interests, sovereignty and nationalism (of other member states) high up on the ranking scale.

4.7.2 Harare Workshop

As part of the study, the Consultant was required to organize a regional workshop to obtain feedback from stakeholders on the constraints to implementation of recommendations as well as suggesting actions on the way forward, which could be used to accelerate implementation of the recommendations. In this regard, a workshop was organized between July 9 and 10, 2001 at the Sheraton Hotel, in Harare, Zimbabwe. A full report on the workshop proceedings is presented as a separate document.

Key differences from the workshop (when compared with results emanating from the electronic survey) can be listed as follows:

- In excess of 50 percent of the delegates at the Harare workshop were from public sector institutions or inter-governmental secretariats. The electronic survey targeted private sector/transport service provider's stakeholders, who formed the majority of respondents.
- The electronic survey (and study tour) were primarily quantitative exercises when compared to the Harare workshop that was qualitative.
- It became evident that the respondents of the electronic questionnaire emphasized the need for greater private sector involvement in the transport sector. The Harare workshop placed less emphasis on this development, in part, possibly due to a measure of defensiveness as the majority of the respondents were primarily from the public sector.

4.7.3 Overall Rankings

Table 4.7 ranks the 20 perceptive variables according to the sum of the respondents' rankings by mode. Taking for example (see Table 4.6), perceptive variable A (translation of model legislation and policies into national frameworks), the summation of respondents' rankings equals 31. This is based on road respondents ranking this perceptive variable in 3rd place; rail, in 10th place; air in 3rd place; sea in 9th place and pipeline in 6th place. Adding these rankings (3 + 10 + 3 + 9 + 6) equals 31. The perceptive variable with the lowest sum (of ranking positions), is indicative of that variable being given the highest rank (when all rankings are taken into account). From this ranking exercise, insufficient resources (technical and financial) have the lowest total, and are, therefore the highest rank in overall importance.

Table 4.7 Overall Ranking of Perceptive Variables (Constraints)

Constraint/Perceptive Variable	Rank	Total
Insufficient resources (technical and financial)	1	15
Harmonization of legislation and policies	2	23
Implementation capacity within governments	3	26
Translation of model legislation and policies into national frameworks	4	31
Inadequate monitoring mechanisms	5	33
Different stages of socioeconomic development	6	34
Lack of business focus at government level	7	44
Insufficient consultation/coordination at national and regional level	8	44
Lack of stakeholder commitment	9	52
Insufficient involvement of all stakeholders	10	54
Inadequate dissemination and application of research information	11	56
Inadequate supporting structures and synchronization	12	58
Low level of awareness of regional activities	13	61
Vested interests, sovereignty and nationalism	14	66
External influences	15	67
Institutional gaps	16	68
Ad hoc changes in government policy	17	72
Lack of advocacy	18	72
Political instability	19	76
Insufficient working/viable examples	20	98

4.8 Summary

This chapter has provided the results of the electronic survey conducted to ascertain respondents' views on a number of perceptive variables (in this case constraints to implementation). Taking the modal results from Table 4.6, there are certain constraints that are of critical importance across all transport modes.

As a closing note, the number of respondents in some cases (see Appendix F) being on the low side may have slightly affected the ranking of perceptive variables. In such cases views from the qualitative interviews have been used to derive conclusions presented.

CHAPTER 5.
QUANTITATIVE TRANSPORT COST ANALYSIS BY CORRIDOR AND MODE

5.1 Introduction

The challenges described in previous chapters are important factors contributing to transit transport cost in the region. The purpose of this chapter is to quantify the resulting total transport costs and their breakdown by mode and mode combinations for different corridors in the region. An intermodal comparison of costs is also made, as well as benchmarking where possible. Following this, potential cost savings for road and rail transport are quantified. Finally, conclusions are made.

5.2 Background

5.2.1 Description of Cost Categories

Cost data were obtained from a number of sources (5-12 and 27-30) and aggregated to calculate transport cost by corridor and mode. Total costs were assumed to consist of NDR and DR costs.

NDR costs comprise:

- *Port charges*, consisting of:
  - Wharfage charges,
  - Handling charges, and
  - Clearing charges.
- *Border post charges* (non distance related portion), consisting of:
  - Third party insurance,
  - Cross-border permit fee,
  - Carbon tax, and
  - Border toll.
- *Trans-shipment cost,* applicable in cases of intermodal transfers.

Distance related costs comprise:

- Haulage costs,
- Border post charges (distance related portion), namely road user charges,
- Toll fees,
- Other costs, consisting of:
  - Insurance premiums
  - Facilitation fees, and
  - Stocks-in-transit (inventory cost).

5.2.2 Formats for Presenting Cost Information

Three formats are used for presenting cost information. Firstly, all costs (i.e., both NDR and DR costs) are presented as cost per container per corridor (Table 5.1). Secondly, distance related costs are presented as cost per container per kilometer (Table 5.2), in order to enable the comparison of distance related costs between corridors. Thirdly, actual costs are presented relative to average values, in order to identify "outliers" (Table 5.3).

5.3 Results Obtained

5.3.1 Road Transport

Cost information obtained for road transport is given in various tables and figures. Table 5.1 gives actual cost per corridor. Table 5.2 gives actual cost per corridor and per kilometer, and Table 5.3 gives the actual cost/average cost ratio. Figure 5.1 presents NDR cost, and Figure 5.2 DR cost. Results of the analysis are discussed below. It should be noted that, in these tables, "Table no" refers to the number of the spreadsheet in the cost analysis model, which has not been included in the report.

5.3.1.1 NDR Cost

Table 5.1 and Figure 5.1 show that average NDR cost is about $500 per container per corridor. This table also shows that port charges are the single biggest contributor to NDR cost. Corridors that deviate from this average are:

- The Harare–Lilongwe and the Tete–Lusaka corridors, where NDR costs are low because port charges are not applicable.
- The two Dar es Salaam corridors (Dar es Salaam – Harare and Dar es Salaam–Blantyre corridors) where the high port charges at Dar es Salaam cause these two corridors to be the most expensive. Table 5.1 shows that port charges at Dar es Salaam are about 150 percent of the charges at other ports in the region.

5.3.1.2 DR Cost

Table 5.2 and Figure 5.2 indicate that the Dar es Salaam–Blantyre corridor is more than 40 percent more expensive than the Maputo–Johannesburg and the Walvis Bay–Noordoewer corridors. Table 5.2 also shows that haulage cost in general contributes more than 90 percent to total DR cost. The fact that haulage cost for the Maputo–Johannesburg corridor is 40 percent lower than for the Dar es Salaam–Blantyre corridor, indicates the potential for reducing transport cost by creating an enabling environment that would promote efficiency.

5.3.1.3 Actual Cost Relative to Average Cost

Table 5.3 shows the variation in the "actual/average cost ratio" between corridors and hence enables "outliers" to be identified. Regarding *total NDR cost*, the Dar es Salaam corridor has the highest ratio of 1.46, due to the high port charges at Dar es Salaam, and the Tete–Lusaka corridor the lowest ratio of 0.11, given the absence of port charges on this corridor. Regarding

NDR border charges, the Durban – Lusaka corridor has the highest ratio of 2.05–this can be ascribed to the combined effect of three border posts on this corridor and the high average charges per border crossing. Regarding total *DR costs*, the variation is less pronounced: from a maximum of 1.18 for the Dar es Salaam corridor to a minimum of 0.86 for the Maputo–Johannesburg corridor. In both cases, this is related to corresponding variations in haulage costs.

5.3.2 Rail Transport

Table 5.4 gives actual cost per corridor. Table 5.5 gives actual cost per corridor and per kilometer. Table 5.6 gives the ratio between actual cost and average cost. Figure 5.3 shows non distance related cost, whereas distance related cost is presented in Figure 5.4. Results obtained are discussed below. It should be noted that, in these tables, "Table no" refers to the number of the spreadsheet in the cost analysis model, which has not been included in the report.

5.3.2.1 NDR Cost

In the case of rail transport, port charges are the only NDR cost component. Table 5.4. and Figure 5.3 show that port charges for Maputo, Beira and Durban are relatively similar and vary between a low of $430 per container at Beira to a high of $448 at Durban.

5.3.2.2 DR Cost

Table 5.5 and Figure 5.4 reveal that haulage cost contributes more than 90 percent of total DR cost. They also reveal that the Beira–Lubumbashi corridor is 50 percent more expensive than the least expensive rail corridors (Maputo–Johannesburg and Beira–Blantyre), in line with haulage cost fluctuations on these corridors. The high value for "Other costs" on the Maputo–Lavumisa corridor is directly linked to the low average trip speed of 3.8 km/h on this corridor (see Table 5.20), which increases trip duration and leads to high values for this cost component (consisting of insurance, facilitation fees and stocks-in-transit). As in the case of road transport, it is important to note the existence of low haulage cost on some corridors indicates the possibility of reducing transport cost on the more expensive corridors by creating an environment that promotes efficiency in the provision of transport services.

5.3.2.3 Actual Cost Relative to Average Cost

Table 5.6 confirms the patterns outlined above: port charges are relatively stable, haulage cost shows a considerable fluctuation between corridors, and the slow trip speed on the Maputo – Lavumisa corridor causes the ratio for "Other costs" to be a high 2.08.

Table 5.1: Road Transport: Actual Cost per Corridor ($)

Corridor					Cost category										
					Non-distance related				Distance related					Total cost	
					($/container/corridor)				($/container/corridor)					($/cont/	($/cont/
Main	Sub-corridor	Corri-dor no	Table no	Numb border posts	Port charges	Border post (NDR)	Trans-ship-ment	Total	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total	km)	corridor)
Maputo															
	Maputo - Lavumisa	1	16	1	440	66	0	506	330	17	0	5	352	3.260	857
	Maputo - Johannesburg	2	17	1	440	58	0	498	658	17	32	10	717	2.165	1215
Beira															
	Beira - Lubumbashi (via Harare and Lusaka)	5	19	3	430	101	0	531	2264	127	0	63	2453	1.887	2984
	Beira - Blantyre (via Tete)	6	20	1	430	69	0	499	1143	55	20	35	1253	2.234	1751
	Beira - Blantyre (via Nsanje)	7	21	1	430	69	0	499	828	55	0	25	908	2.477	1407
Nacala															
	Nacala - Lusaka (via Lilongwe)	9	22	2	430	96	0	526	2466	125	0	48	2639	1.784	3165
	Nacala - Mtwara	10	23	1	430	48	0	478	1102	57	0	20	1180	2.193	1658
Tete															
	Harare - Lilongwe (via Blantyre)	11	24	2	0	136	0	136	1395	92	50	25	1562	1.828	1698
	Tete - Lusaka	12	25	1	0	55	0	55	1151	49	0	23	1224	1.499	1279
Durban															
	Durban - Border with DRC (via Beit Bridge)	13	26	2	448	55	0	503	3410	73	56	92	3631	1.583	4134
	Durban - Lusaka (via Plumtree)	14	27	3	448	153	0	601	3395	184	32	109	3720	1.712	4320
Dar es Salaam															
	Dar es Salaam - Harare (via Lusaka)	15	28	2	680	33	0	713	3741	125	0	114	3980	1.884	4693
	Dar es Salaam - Blantyre (via Lilongwe)	16	29	1	680	21	0	701	3366	78	50	59	3552	2.098	4253
Walvis Bay															
	Walvis Bay - Harare (via Maun)	19	30	2	445	121	0	566	3349	151	0	64	3564	1.715	4130
	Walvis Bay - Noordoewer	21	31	0	445	0	0	445	1446	0	0	21	1467	1.612	1912
	Walvis Bay - Johannesburg (via Gobabis)	22	32	2	445	111	0	556	2279	131	0	73	2482	1.612	3038

Notes:

NDR = Non-distance related, e.g. third party insurance

DR = Distance related, e.g. road use charges (transit fees)

I + B + S = Insurance + Facilitation fees + Stocks-in-transit

NA = not applicable

Table 5.2: Road Transport: Actual Cost per Corridor and per Kilometer ($)

Corridor					Cost category									
					Non-distance related ($/container/corridor)				Distance related ($/container/km)					Total ($/cont/km)
Main	Sub-corridor	Corri-dor no	Table no	Numb border posts	Port charges	Border post (NDR)	Trans-ship-ment	Total	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total	
Maputo														
	Maputo - Lavumisa	1	16	1	440	66	0	506	1.256	0.064	0.000	0.018	1.338	3.260
	Maputo - Johannesburg	2	17	1	440	58	0	498	1.174	0.030	0.057	0.018	1.279	2.165
Beira														
	Beira - Lubumbashi (via Harare and Lusaka)	5	19	3	430	101	0	531	1.432	0.080	0.000	0.040	1.552	1.887
	Beira - Blantyre (via Tete)	6	20	1	430	69	0	499	1.458	0.070	0.026	0.045	1.598	2.234
	Beira - Blantyre (via Nsanje)	7	21	1	430	69	0	499	1.458	0.096	0.000	0.045	1.599	2.477
Nacala														
	Nacala - Lusaka (via Lilongwe)	9	22	2	430	96	0	526	1.390	0.070	0.000	0.027	1.488	1.784
	Nacala - Mtwara	10	23	1	430	48	0	478	1.458	0.075	0.000	0.027	1.560	2.193
Tete														
	Harare - Lilongwe (via Blantyre)	11	24	2	0	136	0	136	1.502	0.099	0.054	0.027	1.681	1.828
	Tete - Lusaka	12	25	1	0	55	0	55	1.350	0.058	0.000	0.027	1.434	1.499
Durban														
	Durban - Border with DRC (via Beit Bridge)	13	26	2	448	55	0	503	1.306	0.028	0.021	0.035	1.390	1.583
	Durban - Lusaka (via Plumtree)	14	27	3	448	153	0	601	1.345	0.073	0.013	0.043	1.474	1.712
Dar es Salaam														
	Dar es Salaam - Harare (via Lusaka)	15	28	2	680	33	0	713	1.502	0.050	0.000	0.046	1.598	1.884
	Dar es Salaam - Blantyre (via Lilongwe)	16	29	1	680	21	0	701	1.660	0.038	0.025	0.029	1.752	2.098
Walvis Bay														
	Walvis Bay - Harare (via Maun)	19	30	2	445	121	0	566	1.390	0.063	0.000	0.027	1.480	1.715
	Walvis Bay - Noordoewer	21	31	0	445	0	0	445	1.219	0.000	0.000	0.018	1.237	1.612
	Walvis Bay - Johannesburg (via Gobabis)	22	32	2	445	111	0	556	1.209	0.069	0.000	0.039	1.317	1.612
Notes:														
NDR = Non-distance related, e.g. third party insurance														
DR = Distance related, e.g. road use charges (transit fees)														
I + B + S = Insurance + Facilitation fees + Stocks-in-transit														
NA = not applicable														

Table 5.3: Road Transport: Ratio: Actual Cost/Average Cost

Corridor					Cost category									
					Non-distance related				Distance related					Total
					Ratio				Ratio					Ratio
Main	Sub-corridor	Corri-dor no	Table no	Numb border posts	Port charges	Border post (NDR)	Trans-ship-ment	Total	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total	
Maputo														
	Maputo - Lavumisa	1	16	1	1.06	0.88	NA	1.04	0.91	1.06	0.00	0.58	0.90	1.65
	Maputo - Johannesburg	2	17	1	1.06	0.77	NA	1.02	0.85	0.50	4.68	0.56	0.86	1.10
Beira														
	Beira - Lubumbashi (via Harare and Lusaka)	5	19	3	1.04	1.35	NA	1.09	1.04	1.33	0.00	1.24	1.04	0.96
	Beira - Blantyre (via Tete)	6	20	1	1.04	0.92	NA	1.02	1.06	1.16	2.09	1.40	1.08	1.13
	Beira - Blantyre (via Nsanje)	7	21	1	1.04	0.92	NA	1.02	1.06	1.60	0.00	1.40	1.08	1.26
Nacala														
	Nacala - Lusaka (via Lilongwe)	9	22	2	1.04	1.29	NA	1.08	1.01	1.17	0.00	0.85	1.00	0.90
	Nacala - Mtwara	10	23	1	1.04	0.65	NA	0.98	1.06	1.25	0.00	0.85	1.05	1.11
Tete														
	Harare - Lilongwe (via Blantyre)	11	24	2	0.00	1.83	NA	0.28	1.09	1.64	4.41	0.85	1.13	0.93
	Tete - Lusaka	12	25	1	0.00	0.74	NA	0.11	0.98	0.96	0.00	0.85	0.97	0.76
Durban														
	Durban - Border with DRC (via Beit Bridge)	13	26	2	1.08	0.74	NA	1.03	0.95	0.46	1.76	1.10	0.94	0.80
	Durban - Lusaka (via Plumtree)	14	27	3	1.08	2.05	NA	1.23	0.97	1.21	1.04	1.35	0.99	0.87
Dar es Salaam														
	Dar es Salaam - Harare (via Lusaka)	15	28	2	1.64	0.45	NA	1.46	1.09	0.83	0.00	1.44	1.08	0.96
	Dar es Salaam - Blantyre (via Lilongwe)	16	29	1	1.64	0.28	NA	1.44	1.20	0.64	2.02	0.91	1.18	1.06
Walvis Bay														
	Walvis Bay - Harare (via Maun)	19	30	2	1.08	1.63	NA	1.16	1.01	1.04	0.00	0.84	1.00	0.87
	Walvis Bay - Noordoewer	21	31	0	1.08	0.00	NA	0.91	0.88	0.00	0.00	0.56	0.83	0.82
	Walvis Bay - Johannesburg (via Gobabis)	22	32	2	1.08	1.50	NA	1.14	0.87	1.15	0.00	1.21	0.89	0.82
Notes:														
NDR = Non-distance related, e.g. third party insurance														
DR = Distance related, e.g. road use charges (transit fees)														
I + B + S = Insurance + Facilitation fees + Stocks-in-transit														
NA = not applicable														

Figure 5.1: Road transport: Non distance related cost ($)

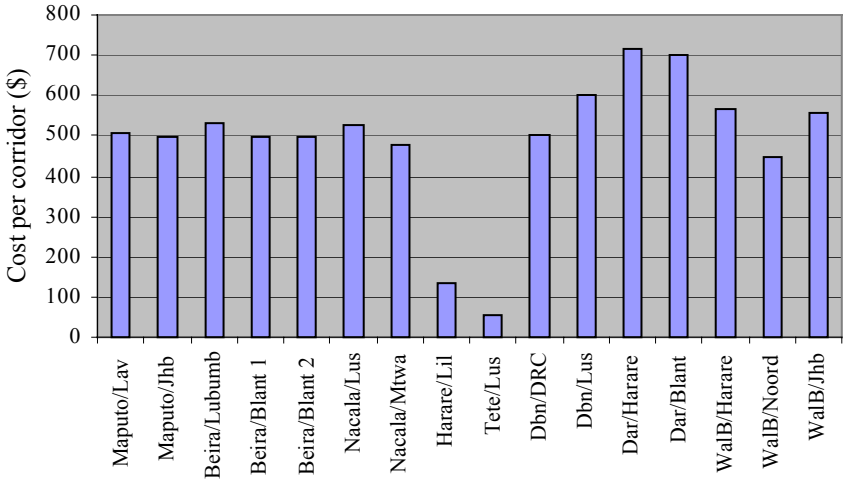


Figure 5.2: Road transport: Distance related cost ($)

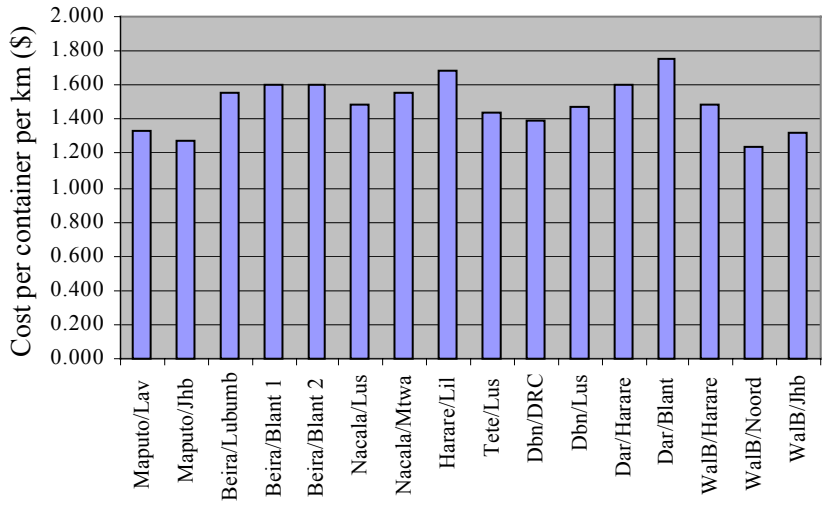


Table 5.4: Rail Transport: Actual Cost per Corridor ($)

Corridor					Cost category										
					Non-distance related ($/container/corridor)				Distance related ($/container/corridor)					Total cost ($/cont/km)	Total cost ($/cont/corridor)
Main	Sub-corridor	Corridor no	Table no	Numb border posts	Port charges	Border post (NDR)	Trans-ship-ment	Total	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total		
Maputo															
	Maputo - Lavumisa	1	33	0	440	0	0	440	287	0	0	34	321	3.172	761
	Maputo - Johannesburg	2	34	0	440	0	0	440	618	0	0	39	657	1.908	1097
	Maputo - Harare (via Chicualacuala)	3	35	0	440	0	0	440	1790	0	0	76	1865	1.874	2305
Beira															
	Beira - Lubumbashi (via Harare and Lusaka)	5	36	0	430	0	0	430	4118	0	0	116	4234	1.824	4664
	Beira - Blantyre (via Nsanje)	7	37	0	430	0	0	430	603	0	0	26	630	1.827	1060
Durban															
	Durban - Lusaka (via Plumtree)	14	38	0	448	0	0	448	2941	0	0	119	3061	1.398	3509

Notes:

NDR = Non-distance related, e.g. third party insurance

DR = Distance related, e.g. road use charges (transit fees)

I + B + S = Insurance + Facilitation fees + Stocks-in-transit

NA = not applicable

Table 5.5: Rail Transport: Actual Cost per Corridor and per Kilometer ($)

Corridor					Cost category									
					Non-distance related ($/container/corridor)				Distance related ($/container/km)					Total ($/cont/ km)
Main	Sub-corridor	Corri-dor no	Table no	Numb border posts	Port charges	Border post (NDR)	Trans-ship-ment	Total	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total	
Maputo														
	Maputo - Lavumisa	1	33	0	440	0	0	440	1.196	0	0	0.143	1.338	3.172
	Maputo - Johannesburg	2	34	0	440	0	0	440	1.074	0	0	0.069	1.143	1.908
	Maputo - Harare (via Chicualacuala)	3	35	0	440	0	0	440	1.455	0	0	0.062	1.517	1.874
Beira														
	Beira - Lubumbashi (via Harare and Lusaka)	5	36	0	430	0	0	430	1.610	0	0	0.046	1.656	1.824
	Beira - Blantyre (via Nsanje)	7	37	0	430	0	0	430	1.040	0	0	0.046	1.086	1.827
Durban														
	Durban - Lusaka (via Plumtree)	14	38	0	448	0	0	448	1.172	0	0	0.048	1.219	1.398
Notes:														
NDR = Non-distance related, e.g. third party insurance														
DR = Distance related, e.g. road use charges (transit fees)														
I + B + S = Insurance + Facilitation fees + Stocks-in-transit														
NA = not applicable														

Table 5.6: Rail Transport: Ratio: Actual Cost/Average Cost

Corridor					Cost category									
					Non-distance related				Distance related					Total
					Ratio				Ratio					Ratio
Main	Sub-corridor	Corri-dor no	Table no	Numb border posts	Port charges	Border post (NDR)	Trans-ship-ment	Total	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total	km)
Maputo														
	Maputo - Lavumisa	1	33	0	1.00	NA	NA	1.00	0.95	NA	NA	2.08	1.01	1.59
	Maputo - Johannesburg	2	34	0	1.00	NA	NA	1.00	0.85	NA	NA	1.00	0.86	0.95
	Maputo - Harare (via Chicualacuala)	3	35	0	1.00	NA	NA	1.00	1.16	NA	NA	0.90	1.14	0.94
Beira														
	Beira - Lubumbashi (via Harare and Lusaka)	5	36	0	0.98	NA	NA	0.98	1.28	NA	NA	0.66	1.25	0.91
	Beira - Blantyre (via Nsanje)	7	37	0	0.98	NA	NA	0.98	0.83	NA	NA	0.66	0.82	0.91
Durban														
	Durban - Lusaka (via Plumtree)	14	38	0	1.02	NA	NA	1.02	0.93	NA	NA	0.69	0.92	0.70

Notes:

NDR = Non-distance related, e.g. third party insurance

DR = Distance related, e.g. road use charges (transit fees)

I + B + S = Insurance + Facilitation fees + Stocks-in-transit

NA = not applicable

Figure 5.3: Rail transport: Non distance related cost

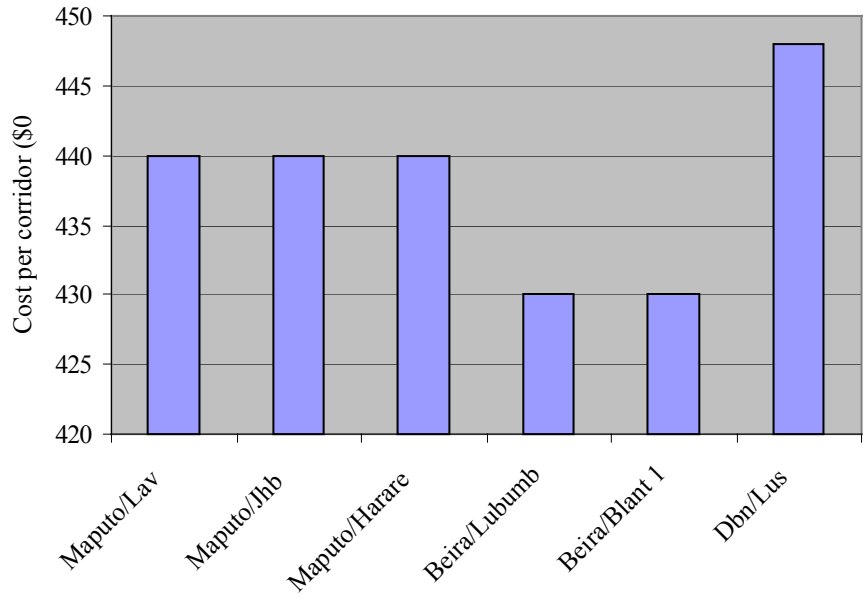
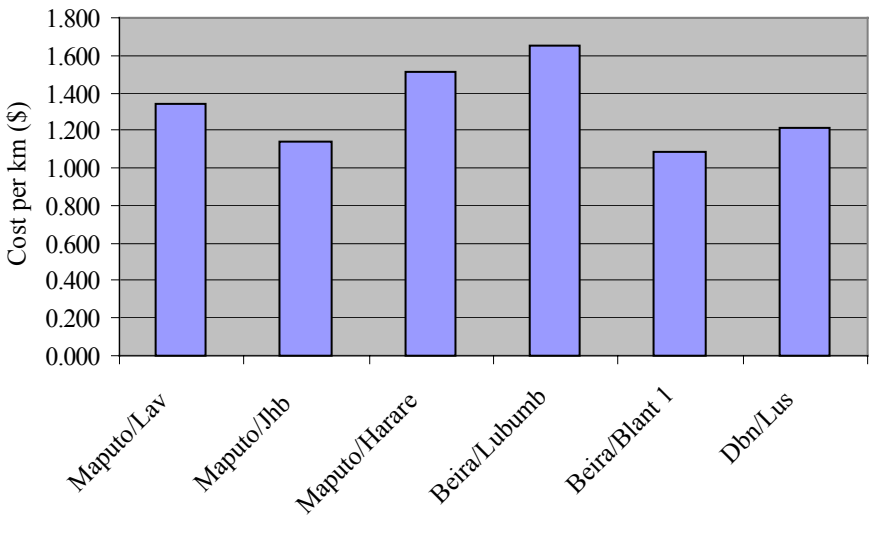


Figure 5.4: Rail transport: Distance related cost



5.3.3 Multimodal Transport

Table 5.7 gives actual cost per corridor. Table 5.8 gives actual cost per corridor and per kilometer. Table 5.9 gives the ratio between actual and average cost. Figure 5.5 presents non distance related cost, and Figure 5.6 presents distance related cost. These results are discussed below. It should be noted that, in these tables, "Table no" refers to the number of the spreadsheet in the cost analysis model, which has not been included in the report.

5.3.3.1 NDR Cost

Table 5.7 and Figure 5.5 show a wide variation in NDR cost. Port charges remain a high contributor to total DNR, but in the case of four corridors that involve inland water transport (Beira–Bujumbura, Lusaka–Kigali, Lilongwe–Bujumbura and Walvis Bay–Bujumbura), high transshipment cost to/from inland water transport is also an important contributor to high NDR cost. Two corridors are subject to the combined effect of port charges and transshipment cost (Beira–Bujumbura and Walvis Bay–Bujumbura), resulting in NDR cost on the most expensive corridor (Beira–Bujumbura) to be more than twice that of the least expensive corridor (Nacala–Lusaka).

5.3.3.2 DR Cost

Table 5.8 and Figure 5.6 show that haulage cost remains the single biggest contributor to total DR cost (approximately 95 percent). This causes total DR cost to fluctuate with haulage cost. Total DR cost on the most expensive corridor (Dar es Salaam–Harare) is 26 percent higher than on the least expensive corridor (Walvis Bay–Harare). Likewise, haulage cost on the Walvis Bay–Harare corridor is 27 percent lower than on the Dar es Salaam–Harare corridor, which indicates the potential for cost reductions on the Dar es Salaam–Harare corridor.

5.3.3.3 Actual Cost Relative to Average Cost

Table 5.9 shows the variation in the actual/average cost ratio for total NDR cost, of between 1.54 (Beira–Bujumbura corridor) and 0.71 (Nacala–Lusaka corridor). This results from the volatility of this ratio in transshipment costs, which vary between 1.98 and 0.18 for these corridors. Total DR cost, on the other hand, is relatively stable and its ratio varies between a maximum of 1.15 (Dar es Salaam–Harare) and minimum of 0.91 (Walvis Bay–Harare).

5.3.4 Sea Transport

Table 5.10 gives actual cost per corridor. Table 5.11 gives actual cost per corridor and per kilometer. It should be noted that, in these tables, "Table no" refers to the number of the spreadsheet in the cost analysis model, which has not been included in the report.

As Maputo–Nacala is the only sea transport corridor considered in this study, a meaningful comparison with other modes is not possible. It is nevertheless interesting to note that haulage cost of $0.42 per container per kilometer is only a fraction of the haulage cost for road, rail and multimodal transport.

Table 5.7: Multimodal Transport: Actual Cost per Corridor ($)

Corridor					Cost category										
					Non-distance related				Distance related					Total cost	
					($/container/corridor)				($/container/corridor)					($/cont/	($/cont/
Main	Sub-corridor	Corri-dor no	Table no	Numb border posts	Port charges	Border post (NDR)	Trans-ship-ment	Total	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total	km)	corridor)
Beira															
	Beira - Lubumbashi (via Harare and Lusaka)	5	39	1	430	26	120	576	2325	53	0	76	2453	1.894	3030
	Beira - Bujumbura (via Harare and Lusaka)	8	40	1	430	26	660	1116	4097	53	0	139	4289	1.954	5405
Nacala															
	Nacala - Lusaka (via Lilongwe)	9	41	1	430	28	60	518	2224	70	0	77	2371	1.656	2889
Durban															
	Durban - Border with DRC (via Beit Bridge)	13	42	1	448	26	120	594	3402	53	0	126	3581	1.650	4175
Dar es Salaam															
	Dar es Salaam - Harare (via Lusaka)	15	43	1	680	26	120	826	3868	53	0	122	4043	1.987	4869
Mpulungu															
	Lusaka - Kigali (via Mpulungu)	17	44	1	0	Na	600	600	2657	Na	0	77	2734	1.634	3334
	Lilongwe - Bujumbura (via Mpulungu)	18	45	1	0	28	600	628	2235	70	0	65	2369	1.794	2997
Walvis Bay															
	Walvis Bay - Harare (via Maun)	19	46	1	445	53	120	618	2973	75	0	98	3146	1.572	3764
	Walvis Bay - Bujumbura (via Livingstone)	20	47	1	445	11	600	1056	5031	52	0	134	5216	1.650	6272

NDR = Non-distance related, e.g. third party insurance

DR = Distance related, e.g. road use charges (transit fees)

I + B + S = Insurance + Facilitation fees + Stocks-in-transit

Na = not available

Table 5.8: Multimodal Transport: Actual Cost per Corridor and per Kilometer ($)

Corridor					Cost category									
					Non-distance related				Distance related					Total
					($/container/corridor)				($/container/km)					($/cont/
Main	Sub-corridor	Corri-	Table	Numb	Port	Border	Trans-	Total	Haulage	Border	Toll	Other	Total	km)
		dor	no	border	charges	post	ship-			post	fees	(I+B+S)		
		no		posts		(NDR)	ment			(DR)				
Beira														
	Beira - Lubumbashi (via Harare and Lusaka)	5	39	1	430	26	120	576	1.453	0.033	0.000	0.048	1.533	1.894
	Beira - Bujumbura (via Harare and Lusaka)	8	40	1	430	26	660	1116	1.481	0.019	0.000	0.050	1.551	1.954
Nacala														
	Nacala - Lusaka (via Lilongwe)	9	41	1	430	28	60	518	1.276	0.040	0.000	0.044	1.360	1.656
Durban														
	Durban - Border with DRC (via Beit Bridge)	13	42	1	448	26	120	594	1.344	0.021	0.000	0.050	1.415	1.650
Dar es Salaam														
	Dar es Salaam - Harare (via Lusaka)	15	43	1	680	26	120	826	1.579	0.021	0.000	0.050	1.650	1.987
Mpulungu														
	Lusaka - Kigali (via Mpulungu)	17	44	1	0	Na	600	600	1.302	Na	0.000	0.038	1.340	1.634
	Lilongwe - Bujumbura (via Mpulungu)	18	45	1	0	28	600	628	1.337	0.042	0.000	0.039	1.418	1.794
Walvis Bay														
	Walvis Bay - Harare (via Maun)	19	46	1	445	53	120	618	1.241	0.031	0.000	0.041	1.313	1.572
	Walvis Bay - Bujumbura (via Livingstone)	20	47	1	445	11	600	1056	1.323	0.014	0.000	0.035	1.372	1.650
Notes:														
NDR = Non-distance related, e.g. third party insurance														
DR = Distance related, e.g. road use charges (transit fees)														
I + B + S = Insurance + Facilitation fees + Stocks-in-transit														
Na = not available														

Table 5.9: Multimodal Transport: Ratio: Actual Cost/Average Cost

Corridor					Cost category									
					Non-distance related				Distance related					Total
					Ratio				Ratio					Ratio
Main	Sub-corridor	Corri-	Table	Numb	Port	Border	Trans-	Total	Haulage	Border	Toll	Other	Total	km)
		dor	no	border	charges	post	ship-			post	fees	(I+B+S)		
		no		posts		(NDR)	ment			(DR)				
Beira														
	Beira - Lubumbashi (via Harare and Lusaka)	5	39	1	1.17	0.94	0.36	0.79	1.06	1.19	NA	1.09	1.07	1.08
	Beira - Bujumbura (via Harare and Lusaka)	8	40	1	1.17	0.94	1.98	1.54	1.08	0.69	NA	1.15	1.08	1.11
Nacala														
	Nacala - Lusaka (via Lilongwe)	9	41	1	1.17	0.98	0.18	0.71	0.93	1.45	NA	1.00	0.94	0.94
Durban														
	Durban - Border with DRC (via Beit Bridge)	13	42	1	1.22	0.94	0.36	0.82	0.98	0.75	NA	1.14	0.98	0.94
Dar es Salaam														
	Dar es Salaam - Harare (via Lusaka)	15	43	1	1.85	0.94	0.36	1.14	1.15	0.78	NA	1.14	1.15	1.13
Mpulungu														
	Lusaka - Kigali (via Mpulungu)	17	44	1	0.00	NA	1.80	0.83	0.95	NA	NA	0.86	0.93	0.93
	Lilongwe - Bujumbura (via Mpulungu)	18	45	1	0.00	0.98	1.80	0.86	0.98	1.52	NA	0.89	0.99	1.02
Walvis Bay														
	Walvis Bay - Harare (via Maun)	19	46	1	1.21	1.89	0.36	0.85	0.91	1.13	NA	0.93	0.91	0.90
	Walvis Bay - Bujumbura (via Livingstone)	20	47	1	1.21	0.40	1.80	1.46	0.97	0.49	NA	0.80	0.95	0.94
Notes:														
NDR = Non-distance related, e.g. third party insurance														
DR = Distance related, e.g. road use charges (transit fees)														
I + B + S = Insurance + Facilitation fees + Stocks-in-transit														
NA = not applicable														

Figure 5.5: Multi-modal transport: Non distance related cost ($)

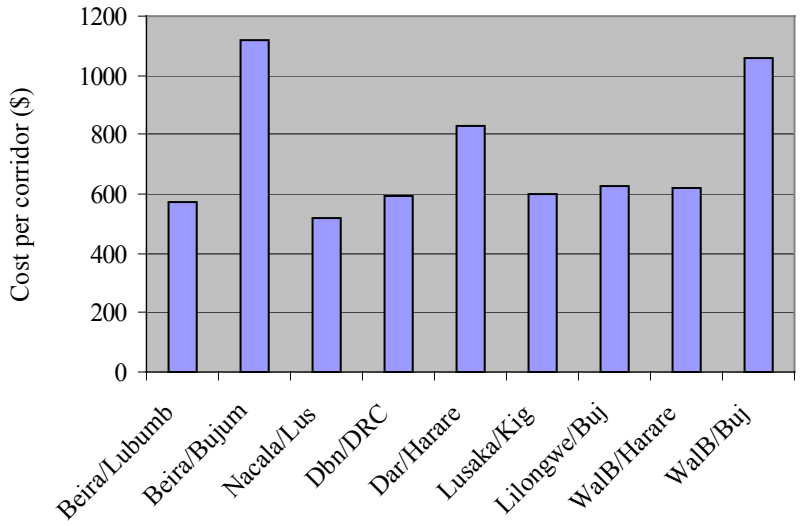


Figure 5.6: Multi-modal transport: Distance related cost ($)

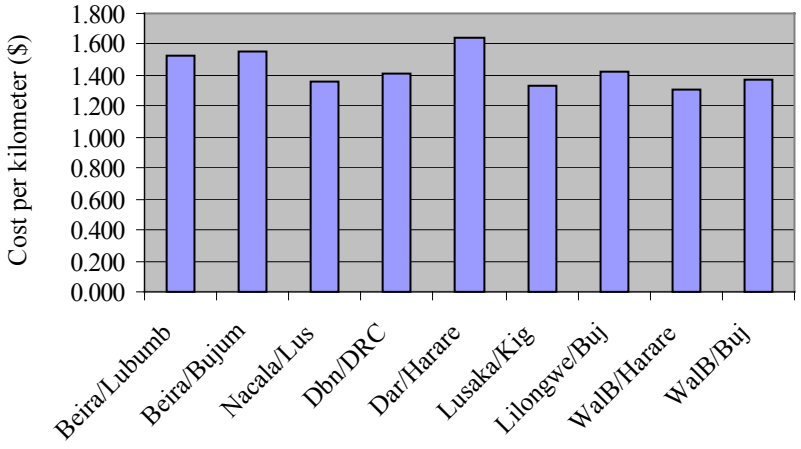


Table 5.10: Sea Transport: Actual Cost per Corridor ($)

Corridor					Cost category										
					Non-distance related				Distance related					Total cost	
					($/container/corridor)				($/container/corridor)					($/cont/	($/cont/
Main	Sub-corridor	Corri-	Table	Numb	Port	Border	Trans-	Total	Haulage	Border	Toll	Other	Total	km)	corridor)
		dor	no	border	charges	post	ship-			post	fees	(I+B+S)			
		no		posts		(NDR)	ment			(DR)					
Maputo															
	Maputo - Nacala	4	18	0	440	0	0	440	882	0	0	113	995	0.683	1435
Notes:															
NDR = Non-distance related, e.g. third party insurance															
DR = Distance related, e.g. road use charges (transit fees)															
I + B + S = Insurance + Facilitation fees + Stocks-in-transit															
NA = not applicable															

Table 5.11: Sea Transport: Actual Cost per Corridor and per Kilometer ($)

Corridor					Cost category									
					Non-distance related				Distance related					Total
					($/container/corridor)				($/container/km)					($/cont/
Main	Sub-corridor	Corri-	Table	Numb	Port	Border	Trans-	Total	Haulage	Border	Toll	Other	Total	km)
		dor	no	border	charges	post	ship-			post	fees	(I+B+S)		
		no		posts		(NDR)	ment			(DR)				
Maputo														
	Maputo - Nacala	4	18	0	440	0	0	440	0.420	0.000	0.000	0.054	0.474	0.683
Notes:														
NDR = Non-distance related, e.g. third party insurance														
DR = Distance related, e.g. road use charges (transit fees)														
I + B + S = Insurance + Facilitation fees + Stocks-in-transit														
NA = not applicable														

5.3.5 Aviation

5.3.5.1 Background

Air freight operations are conducted within the region by a number of operators:

- National airlines (freight/passenger combination)
- Chartered airfreight carriers.

5.3.5.2 Regional Comparison

The airfreight tariffs in the region are as per Tables 5.12 to 5.18. The sources of data were freight forwarders in the region, airlines and the IATA air cargo tariff (TACT) database. Most air cargo is of a high value, low weight nature or is regarded as perishable.

In the tables below, the classification of rates per kilogram weighting is as follows:

Min: Minimum charges applicable, regardless of weight
Nil: Refers to charges applicable on cargos up to 99 kg
100 kg: Refers to charges applicable on cargo up to 299 km
300 kg: Refers to charges applicable on cargo up to 499 km
500 kg: Refers to charges applicable on cargo up to 999 km
1000 kg: Refers to charges applicable on cargo or 1000 kg and above.

Table 5.12: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: Johannesburg (South Africa)

Destination & Airline	Min	Nil	100kg	300kg	500kg	1 000kg
Malawi: Blantyre	33.54	2.01	1.58	1.58	1.42	1.42
Botswana: Gaborone	33.54	1.43	0.89	0.89	0.89	0.89
Mozambique: Maputo	33.54	1.06	0.99	0.99	0.96	0.96
Namibia: Windhoek	33.54	1.24	0.85	0.85	0.63	0.63
Zambia: Lusaka	33.54	1.45	1.30	1.21	1.13	1.13
Zimbabwe: Harare	33.54	1.18	0.89	0.72	0.59	0.59
Tanzania: Dar es Salaam	33.54	1.60	1.39	1.32	1.27	1.25

Table 5.13: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: Blantyre (Malawi)

Destination	Min	Nil	100kg	300kg	500kg	1 000kg
South Africa: Johannesburg	33.54	2.01	1.58	1.58	1.42	1.42
Botswana: Gaborone	35.00	1.71	1.30	1.30	1.13	1.13
Zimbabwe: Harare	30.00	1.21	0.92	0.75	0.63	0.63

Table 5.14: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: Gaborone (Botswana)

Destination	Min	Nil	100kg
South Africa: Johannesburg	25.19	1.15	0.86
Mozambique: Maputo	25.19	1.15	0.86
Namibia: Windhoek	25.19	0.97	0.73
Zambia: Lusaka	25.19	1.15	0.86
Zimbabwe: Harare	25.19	0.97	0.72
Tanzania: Dar es Salaam	25.19	2.10	1.58

Table 5.15: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: Windhoek (Namibia)

Destination	Min	Nil	100kg	300kg
South Africa: Johannesburg	6.83	0.51	0.38	0.35
Botswana: Gaborone	6.83	0.64	0.48	0.39
Mozambique: Maputo	6.83	0.61	0.46	Na
Zambia: Lusaka	9.56	0.57	0.43	0.37
Zimbabwe: Harare	9.56	0.59	0.47	Na

***Note**: Na means not available*

Table 5.16: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: Lusaka (Zambia)

Destination	Min	Nil	100kg
South Africa: Johannesburg	27.00	1.51	1.13
Botswana: Gaborone	27.00	1.59	1.19
Mozambique: Maputo	27.00	1.59	1.19
Namibia: Windhoek	27.00	1.00	0.68
Zimbabwe: Harare	25.00	0.54	0.41
Tanzania: Dar es Salaam	27.00	1.49	1.12

Table 5.17: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: Harare (Zimbabwe)

Destination	Min	Nil	100kg
South Africa: Johannesburg	32.00	1.19	0.89
Malawi: Blantyre	38.00	1.11	0.89
Botswana: Gaborone	32.00	1.45	1.12
Mozambique: Maputo	32.00	1.12	0.85
Nambia: Windhoek	32.00	1.72	1.31
Zambia: Lusaka	32.00	0.78	0.71
Tanzania: Dar es Salaam	38.00	1.82	1.19

Table 5.18: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: Dar es Salaam (Tanzania)

Destination	Min	Nil	100kg
South Africa: Johannesburg	32.00	3.23	2.42
Botswana: Gaborone	32.00	2.88	2.16
Mozambique: Maputo	32.00	2.94	2.19
Nambia: Windhoek	32.00	3.23	2.43
Zambia: Lusaka	32.00	1.90	1.41
Zimbabwe: Harare	38.00	1.82	1.35

5.3.5.3 International Comparison

This section compares the airfreight charges of the SADC countries examined in the previous section with selected North American origins and destinations. Results are given in Tables 5.19 to 5.20.

Table 5.19: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: Anchorage (U.S.)

Destination	Min	Nil	100kg	300kg
New Zealand: Wellington	76.00	11.22	8.39	7.79
Japan: Tokyo	55.00	7.12	4.90	3.93
Singapore: Singapore	55.00	10.22	6.95	3.86
Russia: Vladivostok	55.00	8.20	4.50	3.70
Russia: Moscow	70.00	9.78	6.72	6.72

Table 5.20: Air Freight Charges (US$/kg), per Origin-Destination: 2001 Origin: New York (U.S.)

Destination	Min	Nil	100kg	300kg	500kg
Mexico: Mexico City	45.00	2.05	3.47	1.45	1.38
Uruguay: Montevideo	60.00	8.07	6.38	5.08	4.24
Chile: Santiago	60.00	8.31	4.60	4.13	3.42
Brazil: Sao Paulo	60.00	9.31	6.18	5.14	2.99

Finally, a number of long hauls from regional hubs to one specific center were examined. The common destination in this case was identified as London. Origins used in the comparison were Johannesburg, New York, Buenos Aires and Hong Kong. Results are summarized in Table 5.21.

Table 5.21: Air Freight Charges from Selected Regional Centers to a Common Destination

Route	Min	Nil	100kg	300kg	500kg
Johannesburg – London	36.26	21.55	16.17	12.94	11.10
New York – London	70.00	5.25	4.87	2.78	2.44
Buenos Aires – London	50.00	13.79	8.29	6.48	5.35
Hong Kong – London	57.43	11.41	4.98	4.58	4.58
Sydney – London	43.97	7.94	4.01	2.59	1.99

5.3.5.4 Conclusions

From the above data, a number of conclusions can be drawn:

- The air tariffs levied between the specified centers in the SADC region are substantially lower in US$ terms than those applicable between regional centers in North America and are almost on a par with charges levied on air cargo in Europe, in terms of the minimum charge.
- The higher weight rates (US$/kg) on SADC regional air tariffs result in overall higher air tariffs in the SADC region than between major regional centers in North America and Europe.

On major international export routes to Europe (a major destination for exports from the region) air tariffs from the SADC countries are lower than on other routes to Europe in terms of the minimum charge but higher rates are levied on a weight basis. This results in overall higher air tariffs from the Southern African region to Europe than from other major world centers (e.g., Australia) to Europe.

5.3.6 Pipelines

5.3.6.1 General

There are three pipelines in the Southern African region. These are:

- Mozambique-Zimbabwe Petrozim Petroleum Products Pipeline (Beira–Harare),
- Tanzania-Zambia Tazama Pipeline (Dar es Salaam–Ndola), and
- South Africa: Petronet Pipelines (Durban–Johannesburg).

Key information on each of these pipelines is set out below. Possible future gas pipelines, e.g., Mozambique-South Africa (from the Pande gas field) and Namibia-South Africa (from the Kudu gas field), are not dealt with in this report.

Petrozim Petroleum Products Pipeline
CPMZ owns and operates the pipeline running from the Mozambican port of Beira to a terminal at Feruka, near Mutare, in Zimbabwe. Delivery is to tanks owned and operated by the National Oil Co of Zimbabwe (NOCZIM). A second pipeline, owned and operated by Petrozim Lines (Pty) Ltd, runs from Feruka to Msasa, near Harare. Petrozim Lines is jointly owned by NOCZIM and Lonmin Plc. NOCZIM imports approximately 80 percent of Zimbabwe's petroleum through the pipeline. Pipeline length is 288 km.

The existing CPMZ Feruka terminal was constructed in 1964 for delivery to tanks only and is a class 150 system. The Petrozim pipeline was constructed in the 1990s and is a class 600 system. On line delivery from the CPMZ to the Petrozim system is not practical and CPMZ is at this time installing a new class 600 terminal at Feruka which will have the capacity to

handle both the existing flow rate and that which would be achieved by a planned future expansion of capacity.

Capacity of the pipeline is 1,216,953 metric tons (MT) per annum.

Tazama Pipeline
Tazama Pipelines Limited owns and operates the pipeline running (1.710 km) from Dar es Salaam in Tanzania through to the Indeni refinery in Ndola, Zambia. The pipeline is jointly owned by the governments of Zambia (67 percent) and Tanzania (33 percent). The primary recipient country is Zambia. The capacity of the pipeline is 22,000 bbl/d or 1.1 million MT annually.

Petronet Pipeline
The pipeline is owned and operated by Petronet, one of the Transnet group of parastatal companies in South Africa. The main section of the pipeline runs from Durban to Gauteng in South Africa. The total pipeline length operated by Petronet is 3,000 km. Petronet operates facilities for both crude and refined product.

5.3.6.2 Pipeline Volumes for SADC Pipelines

The volumes transported by each of the pipelines are given in Table 5.22 below.

Table 5.22: Volumes Transported by Pipelines in the Region, 2000

Petrozim/CPMZ	Tazama	Petronet
727,260 MT	503,063 MT	15,900 ml

In the case of Petrozim/CPMZ, the tariff is a guaranteed annual minimum charge levied with volumes <600,000 MT, and therefore the tariff most applicable in terms of actual volumes.

5.3.6.3 Comparison of Pipeline Tariffs Within SADC

Data on the tariffs levied for each of the pipelines was obtained for the year 1999/2000 from the organizations' annual reports. The data is contained in Table 5.23 below.

Table 5.23: Comparison of Pipeline Tariffs (US$/MT), 1999/2000

Beira (2000)	Tazama (1999)	Petronet (2001)
24.19	24.0	15.92

A key point on the comparison between the pipelines is that each of them carries a different ratio of refined to crude product. The units indicated in the Beira and Tazama suggest that a significant portion of the volume is crude, whereas a significant portion of Petronet's volumes is refined product. The Petronet pipeline system has been benchmarked as having a high standard of efficiency in comparison to international operations. Higher tariffs in respect of the Beira and Tazama pipelines are more to do with the lower volumes of product conveyed.

5.4 Intermodal Comparison and Benchmarking

5.4.1 Intermodal Comparison of Transport Costs

An intermodal comparison of NDR and DR costs for road, rail, multimodal and sea transport are made in a number of tables and figures. Tables 5.24 and 5.25 respectively give the results of an intermodal comparison of NDR and DR cost. Figures 5.7 and 5.8 respectively present these comparisons graphically. Results are discussed below.

5.4.1.1 NDR Cost

Table 5.24 and Figure 5.7 show the result of an intermodal comparison of NDR cost. Firstly, the variation (differences) between minimum and maximum values are important. In the case of rail transport, there is almost no variation since port charges are the only component of NDR cost and port charges for the rail corridors are relatively similar. The same applies to sea transport. Road and multimodal transport, on the other hand, show a big variation, as NDR costs in their case also include border post charges and transshipment costs. The latter is especially important in the case of multimodal transport and due to high transshipment cost to/from inland water transport, transshipment costs for some corridors exceed port charges. Secondly, it is interesting to note that multimodal transport has the highest value for average NDR cost. Again, this is caused by high transshipment cost to/from inland water transport in the case of those multimodal corridors where inland water transport forms a leg of the corridor.

5.4.1.2 DR Cost

Table 5.25 and Figure 5.8 indicate that rail transport reveals the biggest variation between minimum and maximum values. (This of course excludes sea transport as there was only one corridor in that case.) They also show that, regarding the three "land" modes, rail is the least expensive, followed by multimodal transport. The difference between average DR cost for rail (the least expensive mode) and road (the most expensive) is however only 12 percent. It is also clear that average DR cost for sea transport is about a third of that for the land transport modes.

Table 5.24: Intermodal Comparison: NDR Cost ($/corridor)

Value	Road	Rail	Multi-modal	Sea
Min	55	430	518	440
Ave	488	438	726	440
Max	713	448	1116	440

Table 5.25: Intermodal Comparison: DR Cost ($/km)

Value	Road	Rail	Multi-modal	Sea
Min	1.237	1.086	1.313	0.474
Ave	1.486	1.327	1.439	0.474
Max	1.681	1.656	1.650	0.474

Figure 5.7: Inter-modal comparison: Non distance related cost ($/corridor)

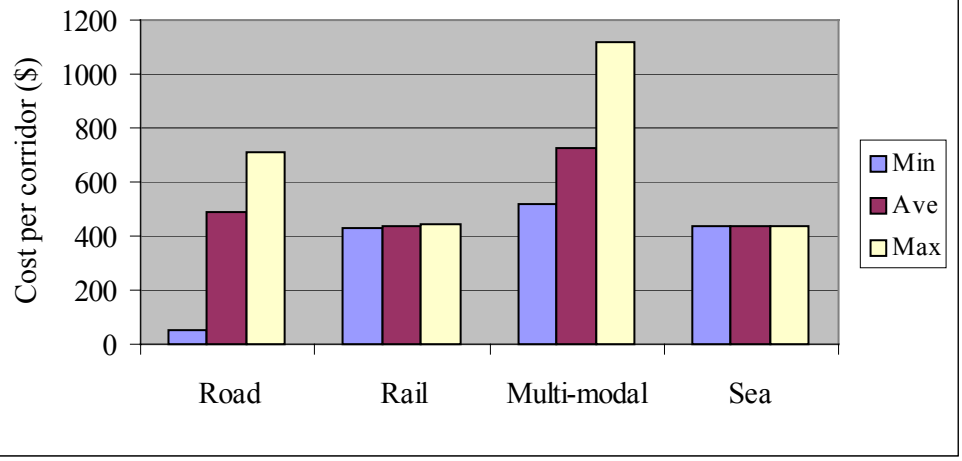
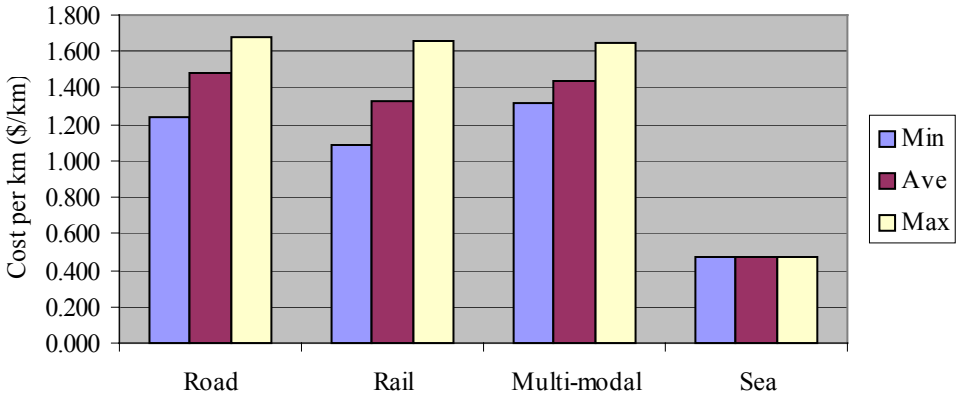


Figure 5.8: Inter-modal comparison: Distance related cost ($/km)



5.4.2 Benchmarking of Regional Transport Cost

Haulage cost for road and rail transport is benchmarked in a number of tables and figures. Tables 5.26 and 5.27 relate to haulage cost for road transport and rail transport respectively. This information is also presented graphically in Figures 5.9 and 5.10. Results are discussed below.

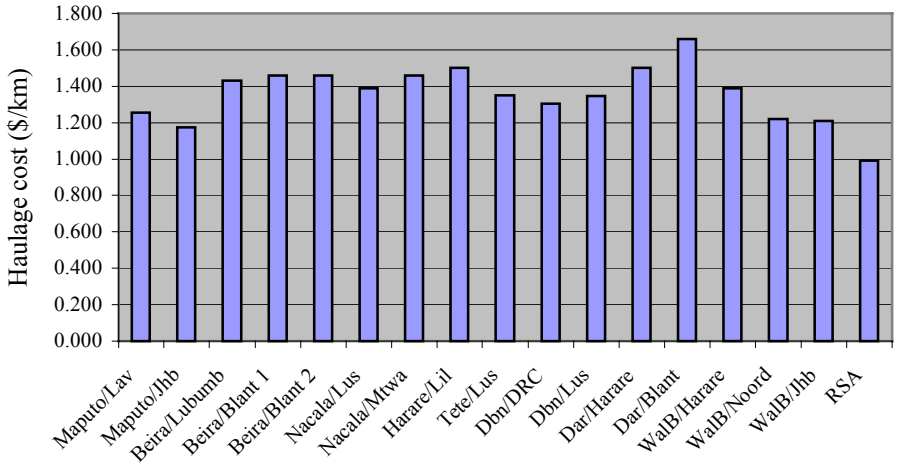
5.4.2.1 Haulage Cost for Road Transport

The road freight industry in South Africa is known to be very competitive, and for this reason South African haulage costs were used to benchmark haulage cost on regional corridors. It is alarming to note, from Table 5.26 and Figure 5.9, that all regional corridors are at least 20 percent more expensive. In the worst case (the Dar es Salaam–Blantyre (via Lilongwe) corridor), haulage cost is 66 percent higher than in South Africa. A total of nine regional corridors are in fact more than 40 percent more expensive than South Africa. While this is partially explained by the higher volumes of goods conveyed, there is obviously considerable potential for cost-saving initiatives in the region, aimed at promoting operational efficiency and eliminating impediments such as long standing times, empty return legs and poor road infrastructure that decreases travel speeds and increases vehicle operating cost.

Table 5.26: Haulage Cost: Road Transport: Benchmarking

Item	Value
Maputo - Lavumisa	1.256
Maputo - Johannesburg	1.174
Beira - Lubumbashi (via Harare and Lusaka)	1.432
Beira - Blantyre (via Tete)	1.458
Beira - Blantyre (via Nsanje)	1.458
Nacala - Lusaka (via Lilongwe)	1.390
Nacala - Mtwara	1.458
Harare - Lilongwe (via Blantyre)	1.502
Tete - Lusaka	1.350
Durban - Border with DRC (via Beit Bridge)	1.306
Durban - Lusaka (via Plumtree)	1.345
Dar es Salaam - Harare (via Lusaka)	1.502
Dar es Salaam - Blantyre (via Lilongwe)	1.660
Walvis Bay - Harare (via Maun)	1.390
Walvis Bay - Noordoewer	1.219
Walvis Bay - Johannesburg (via Gobabis)	1.209
RSA	0.99

Figure 5.9: Haulage cost: Road transport: Benchmarking



5.4.2.2 Haulage Cost for Rail Transport

In Table 5.27 and Figure 5.10, container rail haulage cost in ten countries in the region is compared to three European countries and the USA.

With the exception of Botswana, rail containerized transport is more expensive than the overseas countries. The worst case is Zimbabwe, where haulage cost is almost 4.5 times that of Botswana and the USA, and almost nine times higher than in Germany. It is also of concern to record that rail costs in the region have been increasing over the last few years: average rail costs in 1999 are 33 percent higher than in 1996.

An interesting comparison is South America, where rail costs used to be between $0.60 and $0.80 per container kilometer five years ago. Following privatization, rail costs have been reduced by an average of 40 percent.[5]

Corresponding figures for bulk transport of grain are given below:[6]

Tanzania:	$0.70 per container per kilometer
Mozambique:	$0.96 per container per kilometer
Zimbabwe:	$0.68 per container per kilometer (but subsidized)
Zambia:	$1.63 per container per kilometer.

5.4.2.3 Inland Water Transport

[5] Bo Giersing. Personal Communications, July to September 2001.
[6] Ibid.

A study by Price Waterhouse[7] has indicated that costs on Lake Malawi should be about $0.069 per ton kilometer for bulk traffic and $0.023 for container traffic for revenue and costs to break even. The figure used in this study for the Mpulungu – Bujumbura trip on Lake Tanganyika therefore may seem high, but it should be borne in mind that such operations are characterized by low volumes and short distances.

5.4.2.4 Sea Transport

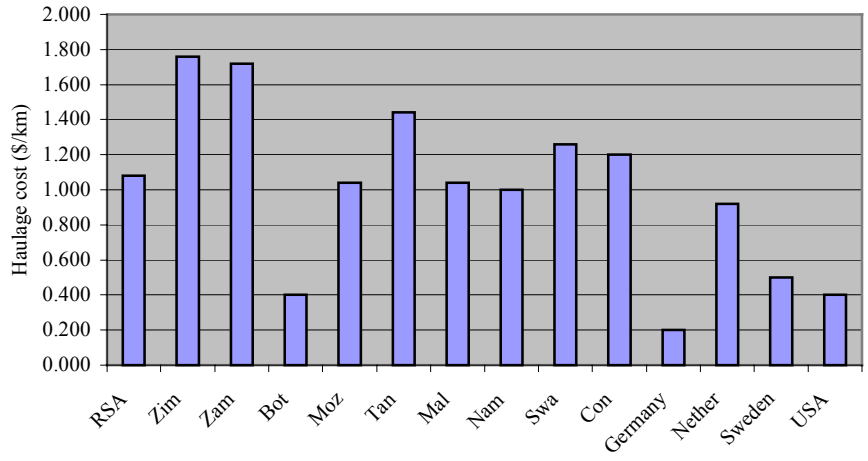
Regarding sea transport, the cost of $0.40 per container kilometer applicable to the Maputo – Nacala trip seems high compared to other routes, but for this specific route it is still competitive. For small vessels on longer routes, costs between $0.010 and $0.020 per container kilometer have been quoted. With sea transport, the critical factor is not distance, but size of the vessel. Huge variations in costs can occur—the extreme would be coal transport from Richards Bay to the east at $0.003 per ton kilometer.

Table 5.27: Haulage Cost: Rail transport: Benchmarking

Item	Value
South Africa (Spoornet)	1.080
Zimbabwe (NRZ)	1.760
Zambia (ZR)	1.720
Botswana (BR)	0.400
Mozambique (CFM)	1.040
Tanzania (Tazara)	1.440
Malawi (Malawi)	1.040
Namibia (Namrail)	1.000
Swaziland (Swaziland)	1.260
DRCongo (DRC)	1.200
Germany	0.200
Netherlands	0.920
Sweden	0.500
United States	0.400

[7] Abt Associates. Technical Working Paper – Valuation of Lake Services Assets. Prepared for Price Waterhouse as part of the Malawi Railways restructuring project, 1996 and funded by USAID/SARP.

Figure 5.10: Haulage cost: Rail transport: Benchmarking



5.5 Quantification of Potential Cost Savings

5.5.1 Introduction

During this study, a number of issues were identified that contribute to high transport cost in the region. Issues listed in the SOW are discussed in Chapter 2.5. Issues identified during stakeholder interviews are discussed in Appendix B. All these issues can be related to factors (independent variables) affecting transport cost. In this section, estimates of cost savings that could be effected by eliminating selected inefficiencies in the case of road and rail transport are given.

5.5.2 Road Transport

5.5.2.1 Examples of System Inefficiencies

The following system inefficiencies were selected to illustrate savings that could be achieved by addressing system inefficiencies:

- delays at border posts,
- slow travel speeds,
- road condition,
- low volumes (suboptimal vehicle utilization), and
- charges per border post.

There are various examples of these inefficiencies. Table 5.28 provides proof of unacceptable delays at certain border posts. In the worst-case scenario (Beit Bridge and Victoria Falls), delays are an average of 36 hours per border post. From Table 5.29 it follows that the average trip speed for road transport is as low as 11.8 km/h (Dar es Salaam–Lusaka) and for rail

transport as low as 3.8 km/h (Maputo–Manzini). Table 5.30 shows that an unacceptably high percentage of the road network can be described as poor. The worst-case scenario is the "Beira Corridor" where 43 percent of the road is classified as "poor".

Table 5.28: Border Post Delays (1999)

Corridor	Border post	Average time to cross border (hours)
Beira	Machipanda Zobue	24
	Mutare	26
Maputo	Ressano Garcia	6
	Namaacha	4
North-south	Beit Bridge	36
	Chirundu	24
	Victoria Falls	36
	Martins Drift	6
Trans-Caprivi	Kazungula	24
Trans-Kalahari	Buitepos	6
	Pioneer Gate	4
Tazara	Kapiri	10
	Nakonde/Tunduma	17

Source: Imani Capricorn and World Bank staff, based on interviews with users

Table 5.29: Road and Rail Transport: Average Transit Times and Trip Speeds (1999)

Corridor	Origin/ destination	Road			Rail		
		Approx distance (km)	Ave transit time (hrs)	Ave speed (km/h)	Approx distance (km)	Ave transit time (hrs)	Ave speed (km/h)
Beira	Beira – Lusaka	*1 150*	*84*	*13.7*	*2 010*	*168*	*11.9*
	Beira – Lilongwe	*850*	*70*	*12.1*	–	–	–
	Beira – Harare	–	–	–	*602*	*48*	*13.0*
Maputo	Maputo – Johannesburg	*604*	*20*	*30.2*	*575*	*72*	*7.9*
	Maputo – Harare	–	–	–	*1 269*	*144*	*8.8*
	Maputo – Manzini	*207*	*7*	*29.5*	*193*	*50*	*3.8*
Nacala	Nacala – Lilongwe	–	–	–	*1 014*	*96*	*10.5*
North – South	Durban – Harare	*1 850*	*120*	*15.4*	*2 065*	*160*	*12.9*
	Durban – Lusaka	*2 280*	*180*	*12.6*	*2 740*	*240*	*11.4*
	Durban – Johannesburg	*600*	*10*	*60.0*	*640*	*24*	*29.0*
Tazara	Dar es Sal – Lusaka	*1 980*	*168*	*11.8*	*2 045*	*192*	*10.6*
	Dar es Sal – Lilongwe	*1 800*	*96*	*18.7*	–	–	–
Trans-Caprivi	Walvis Bay – Lusaka	*1 462*	*72*	*20.3*	–	–	–
Trans-Kalahari	Walvis Bay – Johannesburg	*1 350*	*96*	*14.0*	–	–	–

Source: Imani Capricorn, based on interviews with users.

Table 5.30: SADC Road Corridor Condition

Corridor	% Poor	% Fair	% Good	Not available
North-south	22	17	51	10
Trans-Kalahari		27	73	
Maputo			100	
Tazara	34	21	13	32
Trans-Caprivi	15	20	65	
Beira	43	26	3	28

Source: SATCC, updated by World Bank Staff.

5.5.2.2 Quantification of Potential Cost Reductions

The Durban–Border of DRC corridor (see Table 5.1) was used as a case study to quantify potential cost savings that could be achieved through the introduction of certain initiatives. Details regarding assumptions and calculations are contained in Appendix A.1. Estimates of potential cost savings are contained in Table 5.31 below.

Table 5.31: Road Transport: Calculation of Potential Savings

Item/Initiative	Actual cost per corridor ($)								Saving relative to base case (%)
	Port charges	Border post (NDR)	Trans-shipment	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total	
Current situation (= base case)	448	55	NA	3410	73	55	92	4133	NA
Reduce delays at border posts	448	55	NA	3095	73	55	64	3791	8.28
Increase travel speed	448	55	NA	2301	73	55	51	2984	27.80
Improve road condition	448	55	NA	2959	73	55	83	3673	11.11
Increase volumes	448	55	NA	2719	73	55	92	3442	16.72
Reduce border charges	448	28	NA	3410	73	55	92	4105	0.67

Note: NA = Not applicable

Note: I+B+S = Insurance + facilication fees + stocks-in-transit

It is important to note that these savings are based on the specific assumptions described in Appendix A.1. It should also be observed that potential savings are corridor/mode-specific and that they will differ between corridors and modes. It is nevertheless interesting to note the magnitude of savings that could be achieved relative to the base case (i.e., current costs on the Durban–DRC border corridor). These savings vary between 0.67 percent in the case a rationalized border post charges to almost 28 percent in the case of increased travel speeds due to improved road geometry.

5.5.3 Rail Transport

5.5.3.1 Example of System Inefficiencies

Inefficiencies for which potential savings are calculated are as follows:

- low volumes,
- lack of competition,
- long standing times (other than at border crossings),
- low operating speeds,
- low port volumes, and
- nonexistence of seamless border operations.

5.5.3.2 Quantification of Potential Cost Reductions

The Beira–Lubumbashi corridor (see Table 5.4) was used as the base case to quantify potential cost savings that could be achieved through the introduction of certain initiatives.

Details regarding calculations are contained in Appendix B.2. Estimates of potential cost savings are contained in Table 5.32 below.

Table 5.32: Rail Transport: Calculation of Potential Savings

Item/Initiative	Actual cost per corridor ($)								Saving relative to base case (%)
	Port charges	Border post (NDR)	Trans-shipment	Haulage	Border post (DR)	Toll fees	Other (I+B+S)	Total	
Current situation (= base case)	430	NA	NA	4118	NA	NA	139	4687	NA
Increased railway volumes	430	NA	NA	3400	NA	NA	139	3969	15.32
Increase railway Competition	430	NA	NA	3706	NA	NA	139	4275	8.79
Reduced standing times	430	NA	NA	3878	NA	NA	130	4438	5.31
Increased rail operating speeds	430	NA	NA	4030	NA	NA	130	4590	2.07
Increased port volumes	390	NA	NA	4118	NA	NA	139	4647	0.85
Seamless border operations	430	NA	NA	3998	NA	NA	125	4553	2.86
Total of all savings potentials	390	NA	NA	2540	NA	NA	103	3033	35.29

Note: NA = Not applicable
Note: I+B+S = Insurance + facilication fees + stocks-in-transit

These savings are based on the calculations and assumptions outlined in Appendix A.2. As in the case of road transport, it should be noted that these savings are corridor- and mode-specific. Given the assumptions made, it is interesting to note that savings vary from a low of under 1 percent (in the case of increased port volumes) to a high of over 15 percent (in the case of increased rail volumes). If all initiatives are introduced, an estimated saving of over 35 percent of current costs can be achieved.

5.5.4 Ranking of Factors by Stakeholders

During interviews, stakeholders were asked to rank factors contributing to high transport cost by mode. They were given the following options in the case of each statement:

4 = strongly agree
3 = agree
2 = disagree
1 = strongly disagree.

These factors were those issues listed in the SOW, as well as other issues identified by stakeholders during interviews. Results of the analyses are contained in Appendix B.

It is both interesting and informative to examine the results of the analysis. Firstly, the two factors ranked most important in the case of road transport, namely:

- border post delays, and
- physical road condition,

do not appear at all on the list of issues in the SOW. Secondly, delays at border posts (ranked most important by stakeholders) is only ranked fourth in terms of estimated cost saving

potential (see Table 5.31). This table shows that increased travel speeds have a much higher saving potential than reducing delays at border posts (28 percent versus eight percent).

Delays at border posts may have a high irritation and frustration value and should therefore be perceived as significant. It is however important that decisions to remove system inefficiencies and reduce costs should not only be based on perceptions but also on corridor- and mode-specific scientific analysis. The figures given in Table 5.31 for road and Table 5.32 for rail should therefore be regarded as estimates only.

5.6 Conclusions

5.6.1 General

In this chapter, corridors and modes were compared in terms of actual costs, aggregated under the headings "non distance related costs" (NDR costs) and "distance related costs" (DR costs). The components of NDR costs are port charges, border post charges (NDR portion) and transshipment costs. The components of DR costs are haulage costs, border post charges (DR portion), toll fees and "other costs" (consisting of insurance premiums, facilitation fees and inventory costs). System inefficiencies give rise to high costs by impacting negatively on total cost. An example is "delays at border posts", which adds to haulage costs by adversely affecting operational productivity. "Delay costs" can therefore be defined as costs over and above haulage costs without delays.

5.6.2 Specific Conclusions

The following conclusions resulting from this analysis of costs can now be drawn:

- The analysis of *transit* transport cost in some corridors in the region reveals that costs in many instances actually compare unfavorably with costs in other countries. Long distances in the region inevitably make costs higher, especially in the case of the landlocked countries.

- The analysis confirms that haulage cost is by far the most important component of total cost. In the case of road and rail transport, this is followed by port charges. For multimodal transport, transshipment costs on some corridors are the second biggest contributor to total cost.

- Border post *charges* (both the NDR and DR portions), toll fees and "other costs" constitute a relatively small percentage of total cost. This means that, in theory, haulage costs offer the biggest potential for cost savings. It is however also necessary to examine specific factors impacting on cost by mode. In the case of haulage cost for **road transport**, for example, low travel speeds and long standing times at border posts contribute substantially to high transport cost.

- Regional **air tariffs** in general are higher than those between major regional centers in North America and Europe. This can be ascribed primarily to high overhead costs and low volumes leading to diseconomies of scale.

- All of the **pipelines** in the region were originally natural monopolies in the economic sense, but some competition with other modes does occur. Pipeline tariffs for Petronet are lower than tariffs for Petrozim and Tazama pipelines. While this can also be ascribed to higher volumes and economies of scale, it is also affected by factors such as the status of capital investment, depreciation costs and the extent of maintenance and other overhead costs.

- Costs for **inland water transport** are relatively high. Such operations are, however, once again characterized by low volumes and short distances, which tend to increase costs.

- **Coastal sea transport costs** are also relatively high. In this case, the important determining factor is the size of the vessel. In the study area, low volumes typically are a prohibiting factor against the use of larger vessels.

- Although total **port charges** are relatively consistent between ports (with the exception of Dar es Salaam where charges are substantially higher than the other ports), there is a marked difference in the composition of port charges. For Walvis Bay, Durban and Dar es Salaam, "wharfage" is the most important component. For the Mozambique ports (Maputo, Beira and Nacala), "clearing charges" are the biggest component.

- In terms of both NDR and DR costs, **rail transport** outperforms road and multimodal transport (see Tables 5.24 and 5.25). Rail transport however is plagued by other factors that impact negatively on the attractiveness of rail transport, such as trip duration and frequency of service.

Regarding **corridor specific conclusions**, attention is focused on the three most important road corridors as well as the three most important (mainly) rail corridors in the region, as identified in Maps 2.1 through 2.2 in Chapter 2.

- **Beira – Lusaka/Harare road corridor:** Total NDR costs for this corridor are 9 percent higher than the average for all road corridors. This results from the relatively high border post charges (NDR portion) between Mozambique and Zimbabwe, which causes NDR border charges for this corridor to be 35 percent higher than the average. Also, total DR costs are higher than the average for road corridors. This mainly results from high haulage costs which should be seen in the light of low average speeds on this corridor (less than 14 km/h, from Table 5.29), higher than average delays at Mutare and Chirundu border posts (see Table 5.28), and poor road conditions (see Table 5.30).

- **Durban – Lusaka (via Beit Bridge) road corridor:** Total NDR costs are slightly above the average for road corridors, resulting from the net effect of high port charges and low NDR border charges. Total DR costs are six percent below average. This mainly results from low haulage costs that mitigate the fact that toll fees on the corridor are 76 percent higher than the average for road corridors. It can safely be assumed that keen competition amongst South African operators is a major force in lowering transport cost on this corridor relative to other corridors, despite system inefficiencies that prevail in the form of delays at the Beit Bridge and Chirundu border posts that contribute to long transit times and operational inefficiencies, and poor road conditions on some sections of this route.

- **Durban – Lusaka (via Plumtree) road corridor:** Although port charges on this corridor is the same as that for the previous corridor (Durban – Lusaka (via Beit Bridge), high border post charges (NDR component) on this corridor (resulting from the fact that this corridor involves *three* border crossings of which the RSA/Botswana and Botswana/Zimbabwe crossings are relatively expensive), cause total NDR to be 23 percent higher than average. Regarding DR costs, lower toll fees (relative to the Durban – Lusaka (via Beit Bridge) corridor) are offset by higher DR border post charges, the latter which results from the fact that this route traverses four countries. Total DR costs are just below the average for road corridors, resulting mainly from the fact that haulage costs (the biggest component of total DR costs) are similar to the Durban – Lusaka (via Beit Bridge) corridor and for the same reasons.

- **Maputo – Johannesburg rail corridor:** Total NDR (which is equal to port charges in the case of rail) is average. Total DR costs are about 14 percent less than the average for rail corridors, resulting from the fact that the tariffs of Spoornet and CFM are on the lower end of the regional spectrum.

- **Durban – Lusaka (via Beit Bridge) rail corridor:** Total NDR costs are similar to the previous corridor (the Maputo – Johannesburg rail corridor). Total DR costs are eight percent lower than the average for rail corridors. It is understood that stiff competition from road transport on this corridor plays a pivotal role in lowering haulage cost for rail on this corridor.

- **Durban – Lusaka (via Plumtree) rail corridor:** Total NDR costs are higher than for the two rail corridors above, mainly because of transshipment costs resulting from the road section on this corridor. Total DR costs are also higher than for the Durban–Lusaka (via Plumtree) corridor, resulting from higher haulage costs caused by relatively high rail costs on the Zimbabwe and Zambia sections of the corridor.

5.6.3 Potential for Cost Reduction

Although transport costs in the region, given the traffic volumes and the long distances, seem reasonable, there is considerable potential for improvement. This follows from the existence of operational inefficiencies.

- In the case of **road transport**, various examples of system inefficiencies can be cited. Delays at border posts are unacceptably long, for example 36 hours at each of the Beit Bridge and Victoria Falls border posts. Trip duration is long because of low travel speeds and long standing times, resulting in average trip speeds as low as 11.8 km/h on the Dar es Salaam – Lusaka corridor. A total of 43 percent of the road on the "Beira corridor" is classified as "poor".

Potential savings for road transport were calculated for a number of initiatives aimed at reducing or eliminating system inefficiencies, using the Durban–Border of DRC corridor as a case study.

- It is estimated that increased travel speeds can potentially render savings in total transport cost of almost 28 percent.

- Increased volumes could result in a saving of almost 17 percent relative to current costs. This could be achieved by creating an "enabling" environment where operators could maximize annual distances traveled by their vehicles as well as maximizing vehicle utilization.

- Improved road maintenance will lead to higher (more optimal) travel speeds and reduce vehicle operating cost. It is expected that this would result in an 11 percent saving in transport cost.

- Delays at border posts not only increase haulage costs but also add to frustration levels. The reduction of delays at border posts is calculated to save more than eight percent of total cost by increasing vehicle productivity.

- For various reasons, cost savings in the case of **inland water, coastal sea transport**, **aviation** and **pipelines**, may be less easily achievable. The first two of these modes typically are characterized by low volumes and short distances which drive up costs. Aviation should be treated as a special case as it does not compete directly with road and rail. In general, the contribution of these modes is relatively small compared to road and rail. Considerable savings in aviation however could be achieved if air transport were to be supplied on a regional and not a national basis.

- In the case of **rail transport**, there is also considerable scope for cost reductions. This follows from the existence of system inefficiencies impacting negatively on performance indicators. Average trip speeds, for example, are very low (as low as 3.8 km/h on the Maputo–Manzini link), which leads to long transit times and high costs. Also, the wide variation in haulage costs between different countries in the region suggests the potential for cost-reducing strategies.

- Potential cost savings were calculated for a number of strategies, such as increasing volumes, increasing competition, reducing standing times, increasing operating speeds, increasing port volumes and introducing seamless border operations, using the Beira–Lubumbashi rail corridor as a case study.

- Estimated savings from these initiatives range from 1 percent to more than 15 percent relative to current costs.

- The adoption of compatible systems on the regional basis would also lead to lower costs in the long run.

5.7 Other Factors Influencing Corridor and Mode Attractiveness

Cost is only one of several attributes affecting corridor attractiveness. Other attributes are often equally important and may, in some cases, be even more important than cost. In other cases, they impact on cost, given the inter-relationship between these attributes. An unreliable service on a given corridor, for example, may deter shippers from using the corridor which may, in turn, lead to low volumes, diseconomies of scale and high cost.

Important attributes to corridor attractiveness are listed below.

Total Cost per Trip

To shippers, total cost per trip (rather than cost per ton km) is an important parameter affecting corridor choice where alternatives are available. Total cost is the product of cost per kilometer and distance. This means that, even if cost per kilometer is low but distances are high, transport cost as a percentage of the fob price will be high. Whereas costs may be reduced by introducing appropriate measures, distances are fixed and will, in the case of most land-locked countries, always imply high transport cost.

Frequency of the Service

This is an important factor affecting corridor attractiveness. A case in point is corridors originating and ending in Walvis Bay. Shipping lines prefer not to call at Walvis Bay on a regular basis, which implies longer waiting times at the port. This means that improving other components of the corridor (e.g., the road link) will be less effective unless the whole corridor system is improved and vigorously marketed to change the perceptions of both shippers and shipping lines. An infrequent service will continue to deter shippers from using the corridor and, via low volumes and diseconomies of scale, lead to high costs.

Reliability of the Service

This not only involves whether a shipment will reach its destination safely, but also whether the trip can be completed within the promised time. Where the service is not reliable, it will detract from the attractiveness of the corridor and encourage shippers to use alternative corridors. An unreliable service will thus also lead to low volumes and high costs.

Duration of Trip

Trip duration is an important parameter affecting corridor choice. Table 5.29 shows average transit times and trip speeds for road and rail. For road transport, speeds vary between a high of 60 km/h (Durban–Johannesburg route) to a low of only 11.8 km/h (Dar es Salaam–Lusaka route). Transit times and speeds for rail are even lower and vary between 29 km/h (Durban – Johannesburg route) and 7.9 km/h (Maputo–Manzini route). Speed in this instance is average trip speed, obtained by dividing distance by transit time. It therefore includes a considerable amount of standing time that reduces average speed. This also means that it would be of no value to increase actual operating speed while ignoring delays (e.g., at border posts) when the vehicle is actually not moving at all. Furthermore, if the "best corridor performers" in this table are taken as benchmarks, it follows that there is considerable room for improvement on some of the other corridors.

CHAPTER 6.
STRATEGIES TO ENHANCE IMPLEMENTATION OF RECOMMENDATIONS AND PROTOCOLS

6.1 Introduction

This chapter scientifically determines a variety of strategies that may be adopted by the implementing agencies (e.g., governments or stakeholders as appropriate) to hasten the implementation of the various recommendations (discussed in Section 4.5). In this chapter results of the electronic survey (based on Question 4) will be presented and analyzed in a scientific (i.e., statistical) and qualitative (i.e., descriptive) way. Further analysis of the ranking of perceptive variables, will be undertaken, which it is hoped will shed light on the potential success of implementing the suggested strategies, in order to enhance trade and food security in the region.

6.2 Survey Process

In order to understand the survey process followed in ascertaining respondents views on strategies to fast track the implementation of recommendations/protocols, the reader is referred to Section 1.6 and Appendix F.

6.3 Questionnaire Analysis

For a detailed description of the statistical methodology used in analyzing the data the reader is referred to Section 1.6 and Appendix F. The actual analysis conducted comprised of:

- deriving the arithmetic mean (i.e., average) of a group of observation,
- deriving the standard deviation, and
- analysis of the variance (ANOVA).

6.4 Strategies to Accelerate Implementation

This section presents a statistical analysis (by mode) of the results from the electronic survey. Responses here were based on Question 4 of the questionnaire (Appendix E). The primary purpose of the tables presented in this section is present the ranking of perceptive variables (strategies) derived from the questionnaire responses.

In order to better understand the ranking of the perceptive variables, the reader is referred to Appendix F to gain the definitions of the mean, standard deviation and analysis of variance as discussed in this chapter.

6.4.1 Road Transport

Table 6.1 ranks, according to respondents representing the road industry, the mean scores and standard deviations of a variety of strategies that could be used to accelerate the

implementation of recommendations, which it is hoped will improve the trade and food security in the region.

Table 6.1: Ranking of Potential Implementation Strategies – Road Sector

Rank	Issue	Mean	Std Dev
1	Public/private partnerships	3.55	0.51
2	Cooperation/commitment from COMESA/SADC member states	3.55	0.51
3	Training and education	3.45	0.51
4	Establishment of dedicated funding sources	3.41	0.50
5	Establishment of monitoring mechanisms	3.32	0.48
6	Establishment/strengthening of transport forums e.g., RMFs	3.23	0.43
7	Information sharing/effective communication	3.14	0.35
8	Pooling of regional resources/capital	3.14	0.71
9	Promoting the region as a viable and sustainable economic market	2.91	0.68
10	Drafting of transport policy/legislation	2.86	0.56
11	Government (public sector) involvement in the transport sector	2.00	0.87

Table 6.1 indicates that respondents from the road sector agreed most strongly with the perceptive variable, 'public private partnerships', as being the most important strategy of all the perceptive variables suggested. On the other hand, road respondents disagreed most strongly with the perceptive variable, 'government involvement in the transport sector.' In other words, respondents from this sector believed that, less and not more government involvement in the transport sector, is required for the sector to thrive.

Key statistical points arising from Table 6.1 can be listed as:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 6.1 is indeed statistically robust.

Key points that may explain the ranking order from Table 6.1 can be listed as:

Public/Private Partnerships

A major reason for road respondents ranking public/private partnerships in first position, is that this sector of the transport industry would like to have a greater involvement in ensuring that the road infrastructure system design and level the level of service provided, meets the end consumer needs.

Cooperation and Commitment from and between Member States

An example of inter-state cooperation is seen in the case of the Trans Kalahari Corridor (road), where, Namibia, Botswana and South Africa have established a committee (Trans Kalahari Planning Committee) which sits every quarter to resolve various issues

impacting negatively on the efficient functioning of the corridor, e.g., border hours, axle limits and customs documentation. The chair of the committee rotates between countries. It is accepted by committee members that full commitment is needed in order to make this initiative bear fruit.

Dedicated Funding Sources

In fourth position, the road respondents ranked dedicated funding sources, in light of the need to have adequate funds available to develop and maintain the road transport infrastructures. Ministries of Transport are funded by their counterpart Ministry of Finance and, have to compete with other government portfolios, e.g., health, education, etc. for funds. The vision is that an adequate budget should be provided from dedicated funds, followed through with commitment to use these funds for the purpose that they were intended for.

Regional Management Forums

Naturally following from increased cooperation between COMESA/SADC member states, the establishment of regional management forums (RMFs) has the potential to increase protocol implementation. The ranking in sixth position, alludes to the importance of this initiatives to the road transport respondents. An example of RMF is the Trans Kalahari Management Committee (forum made up of members from Namibia, Botswana and South Africa).

An RMF will consist of private and public stakeholders and will aim to be an efficient and effective forum for addressing regional transport and management issues. Other objectives of a RMF are that they will try to find a common agenda (between participants) on the benefits to be gained by each country through such cooperation. RMFs can be efficient management tools.

6.4.2 Air Transport

Table 6.2 ranks, according to respondents representing the air industry, the mean scores and standard deviations of a variety of strategies that could be used to accelerate the implementation of recommendations, which it is hoped will improve the trade and food security in the region.

Table 6.2: Ranking of Potential Implementation Strategies – Civil Aviation Sector

Rank	Action	Mean	Std Dev
1	Public/private partnerships	3.50	0.58
2	Cooperation/commitment from COMESA/SADC member states	3.50	0.58
3	Drafting of transport policy/legislation	3.50	0.58
4	Promoting the region as a viable and sustainable economic market	3.50	0.58
5	Training and education	3.50	0.58
6	Pooling of regional resources/capital	3.50	0.58
7	Information sharing/effective communication	3.25	0.50
8	Establishment of monitoring mechanisms	3.25	0.50
9	Establishment of dedicated funding sources	3.25	0.50
10	Establishment/strengthening of transport forums e.g., RMFs	2.75	0.50
11	Government (public sector) involvement in the transport sector	2.25	0.98

Table 6.2 indicates that respondents from the civil aviation sector agreed most strongly with the perceptive variable, 'public private partnerships', as being the most important strategy of all the perceptive variables suggested. On the other hand, civil aviation respondents disagreed most strongly with the perceptive variable, 'government involvement in the transport sector.' In other words, respondents from this sector believed that, less and not more government involvement in the transport sector, is required for the sector to thrive.

Key statistical points arising from Table 6.2 can be listed as:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 6.2 is indeed statistically robust.

Key points that may explain the ranking order from Table 6.2 can be listed as:

Marketing may be the Key to Unlocking the Potential (and Realigning the Perceptions) of the Region

From stakeholder interviews, it was gained that there are perceptions that air transport routes to/from and across Africa are not economically sustainable and therefore unprofitable. The ranking in fourth position of the need to promote the region as a viable and sustainable market, confirms the need by air stakeholders for this perception to be challenged. Aggressive marketing to increase and attract volumes is therefore required to increase the sustainability of civil aviation in the region.

Pooling of Resources

The ranking in sixth position of a need to pool resources, recognizes the capital-intensive nature of the civil aviation industry. With each member state supporting its

own national airline, with associated aircraft fleet, serving a limited market, etc., large amounts of resources are not being optimally utilized.

6.4.3 Marine/Inland Water/Ports

Table 6.3 ranks, according to respondents representing the marine/ports industry, the mean scores and standard deviations of a variety of strategies that could be used to accelerate the implementation of recommendations, which it is hoped will improve the trade and food security in the region.

Table 6.3: Ranking of Potential Implementation Strategies – Marine Sector

Rank	Action	Mean	Std Dev
1	Public/private partnerships	4.00	0.00
2	Establishment of monitoring mechanisms	4.00	0.00
3	Cooperation/commitment from COMESA/SADC member states	3.50	0.71
4	Information sharing/effective communication	3.50	0.71
5	Establishment of dedicated funding sources	3.50	0.71
6	Training and education	3.50	0.71
7	Drafting of transport policy/legislation	3.00	0.00
8	Promoting the region as a viable and sustainable economic market	3.00	0.00
9	Establishment/strengthening of transport forums e.g., RMFs	3.00	0.00
10	Pooling of regional resources/capital	3.00	0.00
11	Government (public sector) involvement in the transport sector	2.00	0.00

Table 6.3 indicates that respondents from the marine/ports sector agreed most strongly with the perceptive variable, 'public private partnerships', as being the most important strategy of all the perceptive variables suggested. On the other hand, respondents from the marine/ports sector disagreed most strongly with the perceptive variable, 'government involvement in the transport sector.' In other words, respondents from this sector believed that, less and not more government involvement in the transport sector, is required for the sector to thrive.

Key statistical points arising from Table 6.3 can be listed as:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 6.3 is indeed statistically robust.

Key points that may explain the ranking order from Table 6.3 can be listed as:

Information-Sharing through Effective Communication

The ranking of information sharing in fourth position, confirms the need to engage of appropriate channels of communication to ensure that information reaches the

politicians/decision-makers and those on the operational floor, in a way that they can understand, is essential. During the process of disseminating information, there is also a need to determine who is receiving the information and how it is being passed on to other individuals. The target audience for information on transport issues in the region needs to be significantly wider.

6.4.4 Pipeline Transport

Table 6.4 ranks, according to respondents representing the pipeline industry, the mean scores and standard deviations of a variety of strategies that could be used to accelerate the implementation of recommendations, which it is hoped will improve the trade and food security in the region.

Table 6.4: Ranking of Potential Implementation Strategies – Pipeline Sector

Rank	Q4	Action	Mean	Std Dev
1	A	Public/private partnerships	3.67	0.58
2	C	Information sharing/effective communication	3.67	0.58
3	D	Establishment of monitoring mechanisms	3.67	0.58
4	H	Establishment/strengthening of transport forums e.g., RMFs	3.67	0.58
5	K	Pooling of regional resources/capital	3.67	0.58
6	F	Promoting the region as a viable and sustainable economic market	3.33	1.15
7	I	Establishment of dedicated funding sources	3.33	1.15
8	J	Training and education	3.33	0.58
9	B	Cooperation/commitment from COMESA/SADC member states	3.00	1.00
10	E	Drafting of transport policy/legislation	3.00	0.00
11	G	Government (public sector) involvement in the transport sector	2.67	0.58

Table 6.4 indicates that respondents from the pipeline sector agreed most strongly with the perceptive variable, 'public private partnerships', as being the most important strategy of all the perceptive variables suggested. On the other hand, respondents from the pipeline sector disagreed most strongly with the perceptive variable, 'government involvement in the transport sector.' In other words, respondents from this sector believed that, less and not more government involvement in the transport sector, is required for the sector to thrive.

Key statistical points arising from Table 6.4 can be listed as:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 6.4 is indeed statistically robust.

Key points that may explain the ranking order from Table 6.4 can be listed as:

Monitoring Mechanisms

The ranking in third place of the need to establish monitoring mechanisms, confirms the concerns amongst the pipeline fraternity of losing increasing volumes in the transport of hazardous liquids and gases to other transport modes, e.g., road.

6.4.5 Railway Transport

Table 6.5 ranks, according to respondents representing the rail industry, the mean scores and standard deviations of a variety of strategies that could be used to accelerate the implementation of recommendations, which it is hoped will improve the trade and food security in the region.

Table 6.5: Ranking of Potential Implementation Strategies – Rail Sector

Rank	Action	Mean	Std Dev
1	Cooperation/commitment from COMESA/SADC member states	3.57	0.53
2	Establishment of monitoring mechanisms	3.57	0.53
3	Promoting the region as a viable and sustainable economic market	3.57	0.79
4	Establishment/strengthening of transport forums e.g., RMFs	3.57	0.53
5	Information sharing/effective communication	3.43	0.53
6	Public/private partnerships	3.14	0.69
7	Drafting of transport policy/legislation	3.14	0.69
8	Training and education	3.14	0.69
9	Establishment of dedicated funding sources	3.00	0.82
10	Pooling of regional resources/capital	2.86	0.90
11	Government (public sector) involvement in the transport sector	1.86	0.70

Table 6.5 indicates that respondents from the rail sector agreed most strongly with the perceptive variable, 'cooperation/commitment from COMESA/SADC member states', as being the most important strategy of all the perceptive variables suggested. The international operating nature of many of the region's railways, could have influenced this ranking. On the other hand, respondents from the rail sector disagreed most strongly with the perceptive variable, 'government involvement in the transport sector.' In other words, respondents from this sector believed that, less and not more government involvement in the transport sector, is required for the sector to thrive.

Key statistical points arising from Table 6.5 can be listed as:

- No significant difference was detected between any of the mean scores. This is also confirmed by the ANOVA tests (as presented in Appendix F).
- The lack of any significant differences between the means confirms that the ranking as contained in Table 6.5 is indeed statistically robust.

Key points that may explain the ranking order from Table 6.5 can be listed as:

Government Involvement in Business Processes

The low ranking (eleventh position) of government involvement in the transport sector confirms rail stakeholder perceptions that alternative strategies to rail operations in the region, is the way forward. An example of one such strategy is concessioning. Governments themselves must understand that despite the dynamics of the past (physical borders were drawn up by colonial masters), the current business environment recognizes borderless territories made possible through alliances and liberalization and the need to respond quickly to market needs.

6.4.6 Other Strategies

Other strategies (identified through personal interviews with stakeholders in the region) that have the potential of being implemented in the region are:

Stakeholder Involvement

All stakeholders must be identified. This is a point often missed at the initial stage. Projects are completed without considering completed. There is a need to involve the policy-makers (through constant dialogue) and to get their all the relevant stakeholders. In this way a project may lose its impact, when and if buy-in commitment. All in all there needs to be a greater involvement of stakeholders.

Drafting of Policy

The process of formulating a definitive and comprehensive national transport policy statement needs to commence. The process must take into account the new environments that governments are trying to develop, i.e., public/private partnerships, etc.

Communication/Dialogue between Stakeholders

Continued and constant dialogue between stakeholders can become the key to unlocking the potential of the region. There is also a need to examine ways in which synergies can be achieved by more cooperation, e.g., through code sharing (as practiced in the civil aviation industry). Steering committees can be established (consisting of private and government sector representatives) and Members of Parliament or the media can be sensitized through such committees.

Correct Assessment of Social versus Economic Impacts of Transport Interventions

There is a definite need to clearly delineate the social versus the economic costs/benefits arising from transport interventions. The problem with the implementation of transport infrastructure projects for example, is that such interventions have both social and economic impacts downstream. Governments may

therefore hold back on the implementation of recommendations that may have negative social impacts because such intervention have the tendency to become a political issue.

Devising Targeted Strategies

Targeted (focused) strategies need to be devised. When countries are identified that appear to be on the brink of implementation, they should be assisted to move faster. Even financial resources should be mobilized to assist such countries. Examples of member states that have successfully implemented protocols need to be publicized.

Accepting the Need to Move Slowly

Change is incremental/evolutionary and this needs to be recognized. If things are done, at arms length from governments, the governments will lose control. For some governments this is an undesirable situation. There is a need to move in an incremental fashion along a commercial pathway, rather than jumping along political lines.

Refocus

Trade needs to be refocused to deal with regional countries and implementation of the SADC protocol. Some respondents felt that only once this has been done can one judge with fairness the implementation of the protocol. The solution is that government committees, e.g., RMFs, must be very strong. governments need to decide to give implementation of the protocol a high priority in their respective national programs.

6.5 Strategies Discussed at the Harare Workshop

As already discussed, delegates at the Harare stakeholder workshop also considered action that could accelerate the implementation of recommendations in the region. A summary listing of key actions is presented below (the reader is referred to the report of the Harare workshop, contained in a separate document):

- agreement and commitment of countries to collaborate on corridor development
- identify opportunities for private/public sector partnerships,
- increased involvement of the private sector (representation will be corridor specific) in corridor management committees,
- strengthen national transport associations e.g.: road and clearing agents,
- identification and replication of mechanisms for private sector involvement; e.g., Trans-Kalahari Corridor Management Committee,
- extend awareness of priorities and potential benefits to regional and international investors, and
- make known regional and international success stories to stakeholders,

6.6 Modal Ranking

Table 6.6 brings together responses from the five modes (as contained in Section 6.4) and clearly indicates the ranking of variables according to respondents' perceptions.

Table 6.6: Ranking of Variables/Interventions – All Modes

Strategy/Perceptive Variable	Rank				
	Road	Rail	Air	Mar	PipeL
Public/private partnerships	1	6	1	1	1
Cooperation/commitment from COMESA/SADC member states	2	1	2	4	10
Information sharing/effective communication	7	5	7	3	3
Establishment of monitoring mechanisms	5	2	8	2	2
Drafting of transport policy/legislation	10	7	5	9	9
Promoting the region as a viable and sustainable economic market	9	3	4	10	8
Government (public sector) involvement in the transport sector	11	11	11	11	11
Establishment/strengthening of transport forums e.g., RMFs	6	4	10	8	4
Establishment of dedicated funding sources	4	9	9	5	7
Training and education	3	8	6	6	6
Pooling of regional resources/capital	8	10	3	7	5

6.7 Discussion of Results

This section will discuss and compare the results from the electronic survey.

6.7.1 Ranking Correlations

Looking at Table 6.6 it is evident that ranking correlations showed more consistency than those in Table 4.6. Possible reasons for the greater consistency in the ranking of strategies (according to mode) are:

Fewer Choices

The smaller number of strategies to choose from[8] when compared to 20 constraints (Tables 4.6 and 6.6).

Government Intervention

There was complete correlation between all modes in ranking in 11th position (bottom) the need for government involvement in the transport environment.

[8] Tanzania Harbors Authority. *Annual Report and Accounts* for the year ended June 30, 1999. Dar es Salaam, 2000.

6.8 Overall Rankings

Taking the modal results from Table 6.6, the question can be asked, 'are there certain constraints that are of critical importance across all transport modes?' Table 6.7 presents the overall ranking of perceptive variables (strategies).

Table 6.7: Overall Ranking of Perceptive Variables (Implementation Strategies)

Strategy/Perceptive Variable	Rank	Total
Public/private partnerships	1	10
Cooperation/commitment from COMESA/SADC member states	2	19
Establishment of monitoring mechanisms	3	19
Information sharing/effective communication	4	25
Training and education	5	29
Establishment/strengthening of transport forums e.g., RMFs	6	32
Pooling of regional resources/capital	7	33
Promoting the region as a viable and sustainable economic market	8	34
Establishment of dedicated funding sources	9	34
Drafting of transport policy/legislation	10	40
Government (public sector) involvement in the transport sector	11	55

Table 6.7 ranks the 11 perceptive variables according to the sum of the respondents' rankings by mode. Taking for example (see Table 6.6), perceptive variable A (public/private partnerships), the summation of respondents' rankings equals 10. This is based on road respondents ranking this perceptive variable in 1st place; rail, in 6th place; air in 1st place; sea in 1st place and pipeline in 1st place. Adding these rankings (1 + 6 + 1 + 1 + 1) equals 10. The perceptive variable with the lowest sum (of ranking positions), is indicative of that variable being given the highest rank (when all rankings are taken into account). From this ranking exercise, PPPs have the lowest total, and is therefore is the highest ranked in overall importance.

The number of respondents according to mode (in some cases) being on the low side may have affected the ranking of perceptive variables. In such cases views from the qualitative interviews have been used to derive conclusions to be discussed below.

6.9 Strategy Analysis

This section critically analyses each of the ranked strategies (Table 6.7). Aspects as to which sectors should play a role in the implementation, how can implementation be effected, etc., will be presented. Recommendations as to the way forward in implementing each strategy will also form part of the analysis.

The reader is referred to the Harare workshop report (separate document) to determine the current (or intended) status within SATCC and/or COMESA of implementing a variety of strategies (some of which are discussed below) impacting on transport in the region.

6.9.1 Public-Private Partnerships

By far the most significant factor to emerge from the analysis is the need perceived by nearly all respondents for greater involvement of the private sector at all levels. Four modes ranked this strategy as number one (road, civil aviation, marine and pipeline) and one mode number two (rail). A major reason for involving the private sector is to ensure that the user or consumer is involved in the system design and in the service level provided. The private sector attracts skilled experts and project managers capable of assisting the public sector, and can take over some functions currently handled by government on an outsourced or agency basis. Ideally, the public and private sectors should work in a partnership relationship with the former focusing on the regulatory aspects, the setting of charges and the policy direction as well as inter-state coordination matters.

Public private partnerships can be achieved in at least three forms:

Project specific: e.g., Build-operate-transfer (BOT) infrastructure projects where the private sector not only runs the facility, but provides capital and takes the commercial risk. The role of the public sector is to set and monitor standards and agree fair user charges. Such projects can only be realized where volumes are sufficient to ensure a financial return for the investors. A variation is to run a concession (say, the operation of weighbridges on a tendered basis).

Corridor specific: e.g., Partnerships to develop and promote a corridor (Walvis Bay Corridor) or to remove bottlenecks and achieve efficient freight flows (Trans Kalahari Corridor Committee).

Generic partnership: e.g., Representation at regional forums by the private sector should be increased radically and the private sector should be treated as an equal partner as it has much to contribute, including resources.

We need to ask ourselves what can be done to realize (i.e., the how) public private partnerships? Subactions can be listed as:

Mode	Public Private Partnerships
Road	BOT schemes, e.g., Maputo Corridor in South Africa
Rail	Concessioning/private sector involvement in operations and management, e.g., Central East African Railway (Malawi)
Pipeline	Concessioning
Civil Aviation	Code Sharing/Alliances/private sector partial ownership, e.g., shareholding of Swissair in South African Airways
Marine/Ports	Concessioning of port operations, e.g., the Outsourcing of container port operations in Dar es Salaam

6.9.2 Cooperation/Commitment from COMESA/SADC Member States

Member states in Southern and Eastern Africa associate with either the SADC or COMESA regional organizations, or with both. In the case of SADC, there are now 14 member states while COMESA has 20 members. These organizations have logical structures at a number of different levels to effect regional integration and coordination. In addition, some states are members of the Southern African Customs Union (SACU). Clearly however, with so many groupings, the risk of duplication of activities is real, but the major problem is the time taken to achieve agreement from the governments of so many states. There is a direct relationship between complexity of getting the buy-in/commitment from member states and this increases with the number of member states in a grouping. This is especially the case when some of the states are experiencing economic instability or are involved with military conflict. In addition, the cost of attendance of the many meetings necessary in such structures is of concern to some of the less well-off countries.

One solution to this may be to devise ways of simplifying both the system (including the number of organizations) and the structures. This, of course, would be a long-term goal and some steps have already been taken towards rationalization by these organizations. In the meantime, it is suggested that progress in implementation should be made incrementally after in-principle agreement to a policy has been obtained. In other words, where a member state or states are ready to go ahead with implementation, they should do so even if other states are holding back for whatever reason. The success of "pilot" projects can be a very strong incentive for other states to want to replicate the benefits. It is suggested that the Trans Kalahari Corridor Committee may be a good example of a successful pilot.

Cooperation is one thing, commitment is another, which should originate at highest level. A number of respondents have alluded to national priorities taking precedence over regional, especially with regard to airlines and the promotion of certain routes or the securing of certain revenues. The implication is that despite the signed protocol, the evidence is that at "official" level, there is sometimes non-compliance. This is a more intransigent problem since any penalty for non-compliance is in practice unlikely to be enforceable.

It is being suggested that there needs to be a mechanism developed to obtain buy-in of all stakeholders this could be through concerted and tougher discussions on transport matters at the Council of Ministers level, backed up by good feedback from supporting structures with regard to examples of non-compliance and through performance indicators. Such a mechanism needs to put pressure on member states to implement, recommendations/protocols which have been ratified by member states. On the other hand, involvement of the private sector can play a key role in lobbying for change through increased commitment of member states to protocol implementation.

A variation on this theme (gained from conducting the qualitative interviews) is the fear of dominance by South Africa. South Africa has by far the largest economy in the region and, the other side of this coin, whereby South Africa sometimes does not always communicate the need to review issues agreed with other member states when circumstances change. Examples of the former would be purchase of signaling systems incompatible with Spoornet systems and, of the latter, a decision by South Africa to investigate the reduction of payloads for road

transport. Member states, which have a comparative advantage, e.g., size of local economy, should be discouraged from stalling/resisting implementation recommendations through their non participation in the implementation process.

6.9.3 Establishment of Monitoring Mechanisms

The establishment of monitoring mechanisms has briefly been mentioned in Section 6.4.3. This strategy is considered important because by introducing monitoring systems, there will be an effective performance measuring system to ascertain the rate of progress in removing bottlenecks. Further analysis of this intervention will be presented in this section.

With respect to establishing a monitoring mechanism, we need to determine what should be monitored. What type of indicators (if monitored) will allude to improvements in the transport environment in the southern African region. Potential elements of a monitoring mechanism (e.g., indices) could be:

- decrease in transport costs,
- decrease in travel times,
- progress on milestone achieved, and
- progress of responsibility executed.

In addition to monitoring the above, there is also a need to monitor regional/national capacity (human and technical). Through such monitoring impending problems can be identified and solutions derived. The indices developed can be:

- generic,
- corridor specific, and
- modal specific.

Through the establishment of monitoring mechanisms it is not the intention to establish another bureaucratic structure. What is required is that the people/institutions assigned to conduct the monitoring process fulfill their obligations. Capacity limitations within current public establishments/secretariats may provide the opportunity for the monitoring to be outsourced to the private sector. It would then be required that the contracted organization report back to the secretariats/stakeholders on regular basis regarding the progress of monitoring in the region.

It is imperative that stakeholders from both the private and public come to agreement on what is to be monitored and the deliverables resulting from the monitoring process. Agreement needs to be made on, what types of milestones need to be monitored, the type and structure of the agency responsible for the monitoring and the level and frequency of reporting back to interested stakeholders.

The process of agreeing on what elements should be monitored and by whom, is indeed very challenging. As a first step a database could be developed based on existing information, which could be restructured in order to enable the monitoring process to commence.

6.9.4 Information Sharing and Effective Communication

Aspects of information sharing and effective communication have already been alluded to in Section 6.4.3. Nevertheless, continued analysis proposes that the development of an shared information system (i.e., database) should continue in earnest. Information sharing initiatives have commenced in the region. For example, USAID RAPID have assisted SATCC to set up a website in Johannesburg because of the limited bandwidth availability in Maputo and because the SATCC function is to move to Gaborone shortly.

It is hoped that a web-based database would be open to all and should be multi-functional. It could contain, inter alia:

- transport legislation (regional and national);
- minutes of meetings (secretariats, transport forums, etc.);
- protocols;
- contact names and addresses;
- reports and studies;
- ongoing project reports and evaluations;
- tender notices and announcements; and
- transport statistics.

As the database is developed incrementally, so too could access be increased as and when more information populates the database. The database developed will avoid duplication of effort. For example, Donor agencies intending to fund transport studies in the region, could first see if similar projects have been undertaken or are in the process of being completed. A web-based database with focus on the transport industry has already been developed by CSIR/Transportek. 'Iport' (www.iport.za.com) as it is called, is a multifunctional web-based transport information database.

A Improved information sharing will lead to more effective communication and it is recommended that the database be populated and accessible by SATCC, COMESA, SACU and newer structures such as ASANRA and FESARTA.

6.9.5 Training and Education

The training and education needs of those involved in transport (both in the public and private sectors) are diverse as well as unique. Interviews revealed particular concern for the lack (not only based on numbers but on skill levels) in some government departments and lack of training in customer responsiveness. Within some government departments promotion is based on length of service rather than on skill level and suitability for the position on offer. There is also sometimes a lack of training in management and an inability to communicate and translate decisions into action "on the ground".

There are always initiatives of a capacity building nature ongoing at any particular time, but specific attention perhaps needs to be given to encourage a regional training approach in

transport by assessing minimum skills requirements in the short, medium and long term. The private sector can assist government departments and agencies on a contractual basis.

The plethora of consultants working in the region has given rise to differing standards of delivery and project execution, while the level of skills transfer is sometimes poor. Skills transfer milestones could be built into most projects and progress in this area monitored by an independent party. For example, after 12 months of working alongside a consultant, has there been an increase in knowledge level of the local professional, manifested by him/her having greater responsibility for project delivery.

6.9.6 Establishment and Strengthening of Transport Forums

Continuing the discussion of Section 6.4.1, the establishment and strengthening of existing transport forums is an intervention that can be used to improve implementation of transport recommendations in the region. It is not being suggested that the number of existing forums be increased but rather strengthened. There may be cases, where an increase in the number of forums could be warranted, e.g., transport forums representing new transport corridors.

The strengthening of transport forums has to some extent already been covered under bringing in the private sector more fully and establishing management tools, performance indicators and databases. Nevertheless, it should be noted that currently, there are a number of existing transport forums in the region, representing different transport groups and needs.

There needs to be full public and private participation in discussing secretariat functions of these forums. This will ensure that such forums do meet the need of the stakeholders represented. It is important that the secretariat functions are efficient and the private sector can be asked to give support where necessary. Clearly, wider representation can only be sustained when a forum is perceived to be effective and making tangible progress.

6.9.7 Pooling of Resources

In order to achieve economies of scale in capital expenditure, the pooling of resources may realize this. The civil aviation industry in particular is highly capital intensive, and such strategies may lead to developing a competitive edge in the regional market. Nevertheless, opportunities for pooling lie in all transport subsectors. Table 6.8 indicates how the pooling of resources may be effected by the differing transport modes in the region.

Table 6.8: Pooling of Resources – Transport Sector

Mode	Pooling
Road	Common approach to road user charging structures Common vehicle tracking systems
Air	Regional Training Institute, offering international training programs Standardized aircraft Spare parts Common language used in software Common software platforms Regional airline
Rail	Common software platforms Common signaling systems Common tracking system
Pipeline	Common software platforms Common language used in software
Marine	Common software platforms Common language used in software

For each of the modes represented in Table 6.8 it is being proposed that a regional approach be followed instead of an ad hoc country approach. In addition, there is a need to consolidate a common strategy to ensure harmonization, the pooling of knowledge and resources in the region. An example of where such an approach could be applied is in increasing the level of compatibility of information technology systems used in the region. Achieving this is a challenge, in that often donor agencies may have their own agenda, which may not match that of the region. For example, a donor country may require that the recipient country use the donor country's systems, which may not be compatible to the local systems already being used in the region.

Another strategy to realize pooling of resources is through the enactment of a common purchasing policy for the region. Nevertheless, the drawback of obtaining the buy-in of regional stakeholders is the aspect of sovereignty of each member state.

6.9.8 Promotion of the Region as a Viable Market

Interviews with stakeholders around the region revealed the lack of regional approach in promoting the region (to Europe and/or North America) as having a viable and sustainable transport infrastructure to effect the efficient movement of goods and services. The limited promotion in turn, impacts on the level at which international investors seriously consider developing a market in southern Africa when taking into account the nature of the regional transport infrastructure. In order to reverse this, it is being suggested that as progress is made in getting the transport sector and infrastructure in order, there should be an active worldwide promotion campaign to inform potential investors about these achievements.

6.9.9 Establishment of Dedicated Funding Sources

The establishment of a dedicated transport-funding source, is a big issue, especially in the road sector. The point is that to sustain an economic primary road system, a steady financial stream must be achieved. This can be done through introducing national dedicated funds and,

ultimately, a regional dedicated fund could be established as agreed in the protocol. If such a fund is to be developed, it is imperative that there must be enough revenue generated to ensure its sustainability.

6.9.10 Drafting of Transport Policy/Legislation

This intervention was ranked relatively low but a number of respondents mentioned it. In short, it is the need to harmonize existing legislation and to ensure that each member state has a national transport policy and that this accords with regional transport policy. In some states, there is still a need to amend legislation to bring it in line with the regionally agreed protocols.

6.9.11 Government Involvement

This is an area where there was some divergence between private and public sector. Essentially, the former believes that government should play a more facilitative role and not become involved in operational issues. This factor is less developed in public sector responses where perhaps there is an element of defensiveness or feeling of "loss of control". Neither group of respondents, however, ranked this constraint highly, although it is partly reflected under the need for PPPs. Some distrust is evident because privatization or restructuring is often associated with job losses rather than efficiency and is normally opposed vigorously by organized labor.

CHAPTER 7.
FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

This chapter provides an overview of the study background and objectives. It summarizes the main findings, conclusions and recommendations that are discussed in detail in previous sections. Findings and conclusions specifically relate to *transport costs* in the region and *the implementation of initiatives* aimed at reducing transport costs. Recommendations relate to *strategies/action plans* aimed at speeding up the implementations of these initiatives in order to lower transport costs.

7.2 Study Background and Objectives

The study was commissioned following recommendations of a transport network study planning meeting in Lusaka, Zambia[9] because high transport costs in the region, and particularly those on the main transit corridors, continued to prevail, despite various initiatives by COMESA and SATCC aimed at reducing such costs. This has been a major concern to the whole spectrum of stakeholders, as it impacts negatively on the international competitiveness of the region and jeopardizes the economic integration of the countries concerned.

Against this background, three study objectives were formulated:

- to analyze comparative transit costs along different corridors by road/rail/sea/inland water/pipeline and aviation modes,
- to critically analyze the causes of slow implementation of the various recommendations that are contained in research and workshop reports that can lower transit costs if executed and, and
- to propose modalities of hastening implementation of the recommendations and hence lower transport costs in the region.

The approach followed in this report comprises an analysis of each selected transport corridor by mode, a review of past initiatives to reduce transport cost in the region, a quantitative analysis based on questionnaire responses and interviews as to the reasons for slow progress and proposed strategies for accelerating implementation or identifying new ideas to improve the situation.

In this study all modes of transport are covered, i.e., road, rail, sea, inland water, pipeline and aviation. For the main modes of transport in the region, namely road, rail and inland water transport, (or combinations of these modes), transport costs are captured on 32 corridor-mode combinations. Costs for these modes are analyzed captured under the headings “non distance related costs” and “distance related costs”.

[9] *Proceedings of the Southern Africa Transport Network Study Planning Meeting*. Lusaka, Ambia 26-27 July 2000, TechnoServe-Kenya for USAID/REDSO/ESA.

The consultants working on the USAID RAPID program are of the (Africa Rail Conference 2001) view that "halving transport costs could stimulate an increase in trade by five times", presumably because the goods conveyed would become substantially more competitive on world markets. This report examines what is feasible and what are the main constraints to lowering transport costs that can be removed or minimized by a proper integrated regional strategy.

7.3 Impact of Past Initiatives to Reduce Costs

After presenting the various corridors in detail, perceptions of the reasons for high transport costs are discussed and the impact of past initiatives by COMESA and SADC/SATCC to reduce such costs in the region are elaborated. Progress made with implementation is thus examined. At the workshop in Harare participants agreed that while these initiatives certainly assist in addressing system inefficiencies and reducing transport costs, it is generally accepted that there has been mixed success with implementation. In some cases implementation is slow, in other cases it is non-existent.

During subsequent interviews, important reasons for the lack of success were revealed. Stakeholders were asked to identify constraints (or reasons for the no/slow implementation of these initiatives). Stakeholders were also asked to rank these constraints by mode, using a four-point scale. Results were compared with the results from the Harare workshop and a ranking of these perceptive variables across all modes was calculated.

It is important to observe that the Harare workshop had a majority of participants from the public sector and, although many of the issues raised were the same as those emanating from subsequent interviews, there was a divergence of priority with the private sector. Essentially, the latter believes that government should play a more facilitative role and not become involved in operational issues. This factor is however less developed in public sector responses where perhaps there is an element of defensiveness or feeling of "loss of control". Some distrust is evident because privatization or restructuring is often associated with job losses rather than efficiency and is normally opposed vigorously by organized labor. The "easy" option for a public sector official is often to avoid re-structuring issues since the process can be "stressful" and the official is not necessarily rewarded for taking this different route.

It is also clear that many countries lack the underlying capacity in the public sector to ensure implementation of agreed policies. There is a lack of skills and training in this area. Implementation can also depend on the availability of resources to undertake the necessary coordination and funding for such tasks is not always readily available.

Southern and Eastern Africa are located unfavorably relative to the world's major markets. The distances to these markets are a given and cannot be changed. This is even more true for the landlocked inland African countries, although there may be instances where missing inland transport links could be constructed and routes slightly shortened.

The other factor beyond the control of the strategists is the robustness and size of the region's economies. In international terms the region contributes only a small fraction of the world economy and translates into low volumes of goods on some of the routes. This immediately increases transport costs because significant economies of scale cannot be achieved.

The implication of this is that the main savings are to be made in improving the efficiency of the regional transport sector and in removing bottlenecks wherever possible. Key factors in this regard relate to the efficiency of operations, competition between routes and modes, the condition of the infrastructure, lack of capital investment, poor management and lack of capacity and skills.

Over the last few decades, these problems have been compounded by regional conflicts, the shrinkage and even collapse of some countries' economies as well as natural disasters — all leading to a deterrent effect on international investment. This cycle is only likely to be broken by a concerted effort by the region to present an integrated and harmonized approach, which is sustainable over the longer term.

From the cost analysis of each corridor specific conclusions can be drawn:

- The analysis of *transit* transport cost in some corridors in the region reveals that costs in many instances compare unfavorably with costs in other countries. Long distances in the region inevitably make costs higher, especially in the case of the landlocked countries.

- The analysis confirms that haulage cost is by far the most important component of total cost. In the case of road and rail transport, this is followed by port charges. For multimodal transport, transshipment costs on some corridors are the second biggest contributor to total cost.

- Border post *charges,* toll fees and "other costs" constitute a relatively small percentage of total cost. This means that, in theory, haulage costs offer the biggest potential for cost savings. It is however also necessary to examine specific factors impacting on cost by mode. In the case of haulage cost for **road transport**, for example, low travel speeds and long standing times at border posts contribute substantially to high transport cost.

- Regional **air tariffs** in general are higher than those between major regional centers in North America and Europe. This can be ascribed primarily to high overhead costs and low volumes leading to diseconomies of scale.

- All of the **pipelines** in the region were originally natural monopolies in the economic sense, but some competition with other modes increasingly occurs mainly for reasons of speed and flexibility of delivering the product.

- Costs for **inland water transport** are relatively high. Such operations are however once again characterized by low volumes and short distances, which tend to increase costs.

- **Coastal sea transport costs** are also high. In this case, the important determining factor is the size of the vessel. In the study area, low volumes typically are a prohibiting factor against the use of larger vessels.

- Although total **port charges** are relatively consistent between ports (with the exception of Dar es Salaam where charges are substantially higher than the other ports), there is a marked difference in the composition of port charges. For Walvis Bay, Durban and Dar es Salaam, "wharfage" is the most important component. For the Mozambique ports (Maputo, Beira and Nacala), "clearing charges" are greater.

- **Rail** transport usually outperforms road and multimodal transport in terms of cost, but is plagued by other factors that impact negatively on the modes attractiveness, such as trip duration and frequency of service. Railway inter-networking arrangements can certainly be improved and inter-connectivity is a problem in two areas where regional conflict caused the service to be suspended, (i.e., the Sena Line [Beira-Malawi] and Lobito-DRC).

The reader is also referred to chapter 5 for detailed corridor specific conclusions. Operational inefficiencies include delays at border posts (e.g., up to 36 hours at Beit Bridge), poor sections of road and long standing times (road and rail) - not only at borders, but also at transshipment points. Where vessel mailing frequency is low at certain points a "missed" sailing can result in long delays and storage charges. To minimize such risks shippers tend to use longer routes trading risk for distance.

7.4 Findings and Conclusions

A generic theme with all modes and all corridors in the region is low volumes and long distances compared to other countries in the world. These factors inevitably impact negatively on costs. It was also revealed that costs differ substantially between corridors and that haulage cost generally is the most important component of total cost. Rail transport was found to outperform road and multimodal transport in terms of costs, but it was also revealed that it is plagued by other factors that impact negatively on its modal attractiveness, such as trip duration, frequency of service and reliability.

It was also shown that transport corridors in many instances are subject to system inefficiencies that contribute to high costs. Various examples are given, such as unacceptably long delays at certain border posts, poor road conditions in many cases, low average trip and travel speeds and consequent long trip durations. On some corridors, on the other hand, the relatively low transport costs could be ascribed to private sector involvement, industry deregulation and keen competition between service providers, forcing costs down to the benefit of end users. An important conclusion therefore is that there is indeed potential for cost reductions in many instances by adopting appropriate policies and strategies and

providing an enabling environment and, in so doing, improving the region's international competitiveness.

7.5 Recommendations Regarding Strategies to Overcome Constraints

7.5.1 Introduction

The strategies developed can be divided into two categories, namely generic and mode specific. Through quantification, this study provides the first comprehensive attempt to rank the *constraints* hindering the implementation of initiatives as well as the *strategies* for speeding up implementation based on a solid foundation of evidence.

7.5.2 Strategies to Overcome Generic Constraints

These strategies are discussed below in the ranking order obtained by combining mode-specific rankings. As in the case of constraints, it is important to observe that there are differences between mode-specific rankings as explained in detail in the report. This would indicate the need to tackle problems and implement strategies at the modal level.

7.5.2.1 PPPs

From the analysis, this easily emerged as the most significant factor. A major reason for involving the private sector is to ensure that the user or consumer is involved in the system design and in the service level provided. The private sector attracts skilled experts and project managers capable of assisting the public sector, and can take over some functions currently handled by government on an outsourced or agency basis.

Public private partnerships can be achieved in at least three forms:

- Project specific. An example is build, operate and transfer infrastructure projects where the private sector not only runs the facility, but provides capital and takes the commercial risk. The role of the public sector is to set and monitor standards and agree fair user charges. An important condition for such projects is sufficient volumes to ensure a financial return for the investors. A variation is to run a concession (say, the operation of weighbridges on a tendered basis).
- Corridor specific: e.g., partnerships to develop and promote a corridor (Walvis Bay Corridor) or to remove bottlenecks and achieve efficient freight flows (Trans Kalahari Corridor Committee). Also Route Management Groups.
- Generic partnership: e.g., representation at regional forums by the private sector should be increased radically and the private sector should be treated as an equal partner as it has much to contribute, including resources.

The responsibility for pursuing a course of action should preferably be given to resourced project managers with clear business plans and deadlines rather than to committees. Action-orientated proposals are also more likely to be looked on favorably by funding agencies. Pilot projects can show the benefits of cooperation and be replicated elsewhere.

7.5.2.2 Cooperation/Commitment from COMESA/SADCC Member States

Countries in the region associate with either the SADC or COMESA regional organizations, or with both. Some states are also members of the Southern African Customs Union (SACU). With so many groupings, the risk of duplication of activities is real, but the major problem is the time taken to achieve agreement from the governments of so many states. This is aggravated by the fact that some of the states are experiencing economic instability or are involved with military conflict.

The long-term goal should therefore be to devise ways of simplifying both the system (including the number of organizations) and the structures. As a shorter-term goal, it is suggested that progress in implementation should be made incrementally after in-principle agreement to a policy has been obtained. The success of "pilot" projects (for example the Trans Kalahari Corridor Committee) the can be a very strong incentive for other states to want to replicate the benefits Regarding the problem of cooperation versus commitment, the best approach would appear to be tougher discussions on such matters at the Council of Ministers level, backed up by good feedback from supporting structures with regard to examples of non-compliance and through performance indicators

7.5.2.3 Information Sharing, including Effective Communication

A shared information system is a critical success factor. This would help to avoid duplication of effort, assist decision-making and enable financing organizations to ascertain what other work has been undertaken in each area. A web-based database would be open to all and should be multi-functional. Examples of data types to be included are:

- transport legislation (regional and national);
- minutes of meetings (secretariats, transport forums, etc.);
- protocols;
- contact names and addresses;
- reports and studies;
- ongoing project reports and evaluations;
- tender notices and announcements; and
- transport statistics.

Development of this database should take place incrementally. However, continuous updating is critical. Its architecture should also be compatible with other relevant databases set up in the region. An example of a multifunctional web-based transport information database is Iport, developed by the CSIR for the South African transport industry. Improved information sharing will lead to more effective communication and it is recommended that the database be populated and accessible by SATCC, COMESA, SACU and newer structures such as ASANRA and FESARTA.

7.5.2.4 Establishment of Monitoring Mechanisms

By introducing monitoring systems, there will be an effective performance measuring system to ascertain the rate of progress in removing bottlenecks. Key indicators of such systems could be summarized and would be a tool for the Council of Ministers and others to identify where and why progress is not being made. In this regard, it is important: *what* should be monitored and *how* indicators would have to be used by the member states in a consistent manner. Also, data collection procedures should be standardized. Examples of typical indices are:

- changes in transport costs;
- decreases in travel times;
- progress on milestones set; and
- progress on tasks executed.

Indices could be generic, corridor specific, modal specific or even project specific. The monitoring function should preferably not be assigned to a new structure, but to existing organizations or substructures. Should there be insufficient capacity in the public sector to handle this function internally, then it could typically be contracted to a management consultancy or other specialized firm. It is also important that the private sector should be involved in the system design. Stakeholders from both the public and private sectors need to agree on what is to be monitored, the frequency of monitoring and the deliverables resulting from the monitoring process.

7.5.2.5 Drafting of Transport Policy/Legislation

This involves the need to harmonize existing legislation and to ensure that each member state has a national transport policy and that this accords with regional transport policy. In some states, there is still a need to amend legislation to bring it in line with the regionally agreed Protocols.

7.5.2.6 Promoting the Region as a Viable and Sustainable Economic Market

It is important that a regional approach should be adopted in this regard. The point of departure is that perceptions are of high transport costs and, in some cases, unreliability and long lead times on certain routes. It is suggested that to counter this, an active promotional campaign should accompany successes in the removal of bottlenecks to international users of the various corridors and services.

7.5.2.7 Public Sector Involvement in the Transport Sector

The private sector believes that government should play a more facilitative role and not become involved in operational issues. This factor is however less developed in public sector responses, possibly because of an element of defensiveness or feeling of "loss of control". Some distrust is evident because privatization or restructuring is often associated with job losses rather than efficiency and is normally opposed vigorously by organized labor.

7.5.2.8 Establishment/Strengthening of Transport Forums, e.g., RMFs

This aspect has to some extent already been covered under bringing in the private sector more fully and establishing management tools, performance indicators and databases. It is important that the secretariat functions are efficient and the private sector can be asked to give support where necessary. Wider representation can only be sustained when a forum is perceived to be effective and making tangible progress.

7.5.2.9 Establishing Dedicated Funding Sources

This relates particularly to the roads sector. In order to sustain an economic primary road system, a steady and secure financial stream must be ensured. This can be done through introducing national dedicated funds and, ultimately, a regional dedicated fund could be established as agreed in the protocol.

7.5.2.10 Training and Education

In both the public and private sectors, training and education needs are diverse. Interviews revealed particular concern for the lack of expertise in some government departments and lack of training in customer responsiveness. There is also sometimes a lack of training in management and an inability to communicate and translate decisions into action "on the ground". Specific attention needs to be given to encourage a regional training approach in transport by assessing minimum skills requirements in the short, medium and long term. The private sector can assist government departments and agencies on a contractual basis. Skills transfer in the case of consultants is sometimes poor. Skills transfer milestones could be built into most projects and progress in this area monitored by an independent party.

7.5.2.11 Pooling of Regional Resources/Capital

The civil aviation industry is very capital intensive and therefore offers a primary opportunity for pooling resources. For example, a regional airline, standardized aircraft and parts, common software and shared training programs will assist in achieving economies of scale. Opportunities for pooling do not only exist in aviation, but also in other transport subsectors.

7.5.3 Strategies to Overcome Mode-Specific Constraints

7.5.3.1 Road

Associations such as FESARTA can make very strong contributions towards corridor planning committees that can help the public sector resolve bottlenecks at border posts and ports. FESARTA and selected representatives of individual carriers should therefore play a much stronger role in the sector. Similarly ASANRA and the Road SCOM should be strengthened with road transport sector participants who can give a user perspective on poor sections of road, axle load regulations, transit charges and road fund levies. Delays at border posts can hopefully be radically reduced once the investigations by the RAPID team are complete.

7.5.3.2 Rail

Regarding the involvement of the private sector rail transport, virtually all regional railway systems are already undergoing some form of restructuring. The intention is that the state will retain ownership of the infrastructure and the private sector will be granted an operating concession. The public sector has an important role in ensuring there is fair competition between road and rail and an independent regional transport regulator could assist in this regard. Involvement of the private sector will have to be supported by capital investment, but the first priority must be to drastically improve the management of rail operations and coordination to reduce for example standing time of wagons. The restoration of the Beira-Malawi and DRC-Lobito lines should be considered. Freight tracking and management of railway wagon movements can be critical in reducing delay times.

7.5.3.3 Inland Water and Sea Transport

Low freight volumes using this mode is one of the main reasons for the costs of inland water transport remaining high. Operations can be concessioned to maximize efficiency for such strategic services. Port charges in East Africa, but Dar es Salaam in particular, need special attention and the same approach to the problem as was followed in the Trans Kalahari Corridor can be used, whereby a public private partnership is entered into to systematically address the constraints pertaining to the corridor with buy-in from the top officials in the relevant government departments. Many ports will benefit in due course from re-structuring initiatives currently in progress to bring in the private sector. At present, customers are trading off risk of delays against costs on certain corridors. Container crane productivity is an area deserving serious attention.

7.5.3.4 Pipelines

Information sharing can play an important role in improving operational efficiency. A transport regulator would ensure charges are not excessive. In some instances governments should discourage potentially hazardous liquids from being carried on other modes for long distances where a pipeline exists.

7.5.3.5 Aviation

There is a need for the region to consolidate its collective position, moving from a plethora of small national airlines unable to fully exploit economies of scale to a few larger airlines able to operate profitably on a commercial basis, with appropriate levels of regulation. This is however a difficult area since airlines are associated with national sovereignty and the matter is sensitive. If faster progress is to be made towards air transport liberalization based on the Yammoussokro Decision then independent private sector advisors with an international reputation could be brought in to balance national and carrier vested interests. It is recognized that recent events impacting on the airline industry following the September 11 terrorist attacks in the USA will complicate and possibly retard progress in this area.

7.6 The Way Forward

Table 7.1 details a proposed plan to implement the recommendations. This plan will only be successful, however, if there is true commitment from the public sector to bring the private sector fully into the implementation process. For its part, the private sector must equally be prepared to commit resources and time to assist the public sector. Funding agencies will have a crucial role in giving support to such an initiative on an unprecedented scale. The analysis in this study strongly suggest that this is the key to unlocking the logjam that persists in the transport sector in Southern Africa.

Table 7.1: Proposed Action Plan to Implement Recommendations

Recommendation	Action	Responsibility
Greater involvement of private sector	Special meetings to discuss how private sector can assist (e.g., representation, secretariat, capacity, specific tasks)	ASANRA/SCOMS supported by SATCC and Private Sector Associations
Replication of corridor committees	Workshop to be held to ascertain how such committees can be replicated	SATCC and COMESA together with USAID and other interested parties
Monitoring mechanisms to be introduced	Very performance indicators for measuring progress with removing bottlenecks to be devised and afflict	SATCC plus stakeholders
Simplification of organizational structure	Review progress on simplification and organizational structure and especially modus operandi for groups of countries to proceed cooperating and incrementally where it is problematic for all countries to proceed at the same pace. Progress in future to be measured against performance indicators	SATCC/Council of Ministers
Information sharing and improved communication	Multi-functional web based database to be developed. Should be accessible to all stakeholders and updated regularly.	SATCC to coordinate and resource. Stakeholders to input information
Development of regional training programs	A priorities and resourced regional training program for mode to be established and across modes where this makes sense	SATCC possibly in conjunction with COMESA. Private sector to be involved
Pooling of resources	Opportunities to be investigated for mode and the program developed to be monitored by performance indicators	SATCC
Promotion of region as an attractive market.	A promotional campaign to be launched based on successes in removing corridor bottlenecks as they occur.	SATCC to coordinate with stakeholders for corridor
Establishment of dedicated funding sources	Progress by each country to be reviewed.	Council of Ministers supported by SATCC
Drafting of transport policy and legislation	Progress in each country to be reviewed and assistance mobilized to speed up process	SATCC with funding agencies

APPENDICES

APPENDIX A
DETAILS OF CALCULATION OF POTENTIAL SAVINGS

APPENDIX A.1.1
ROAD TRANSPORT: GENERAL

Impact of system inefficiencies on components of total cost

The inefficiencies listed in Section 3.5.2 affect the various components of total cost (see the first column of Table 3.18) differently. This is shown below.

Delays at border posts

Cost elements affected:
- Haulage cost
  - Capital cost
  - Balance of fixed cost
- "Other" (= I+B+S)

Slow travel speeds

Cost elements affected:
- Haulage cost
  - Balance of fixed cost
  - Vehicle operating cost (including capital cost)
- "Other"

Road condition

Cost elements affected:
- Haulage cost
  - Vehicle operating cost (through affect of road roughness and travel speed on VOC)
- "Other".

Low volumes

Cost elements affected:
Haulage cost (total)

Charges per border post

Cost element affected:
Border post charges.

APPENDIX A.1.2
ROAD TRANSPORT: DELAYS AT BORDER POSTS

General data/assumptions

Distance:	2 611 km
Average trip speed:	12,6 km/hr (from Table 3.20)
Average transit time:	207 hours

Delays at border posts:

Beit Bridge:	36 hours (from Table 3.19)
Chirundu:	24 hours (from Table 3.19)
Total:	60 hours

Assume:
Delays can be reduced by 57 hours to 3 hours
Loading/off-loading time is 18 hours.

Duration of return trip therefore:

Previously:	(207+18)*2)	=	450 hours
Now:	((207-53)+18)*2	=	344 hours

Number of return trips per annum:

Previously:	365*24*0,9/450	=	18
Now:	365*24*0,9/344	=	23

Distance traveled per annum:

Previously:	18*2 611 *2	=	93 996
Now:	23*2 611 *2	=	120 106

Capital cost:

The model shown below was used to calculate capital cost. This model makes provision for the fact that the truck will have a higher replacement cost at the end of its economic life due to inflation.

$$Dep = \frac{(P/(1+I)^{(6n)}}{(E_{I\%}PW,i\%,12n))} * \frac{(1+I)^{(6n+1)}}{(k/12)}$$

where:

Dep	=	capital cost in current dollar per truck kilometer
P	=	current price of a new truck minus current price of set of tires
I	=	inflation rate per month relevant to trucks, expressed as

		decimal
n	=	economic life of truck in years
k	=	distance traveled per year in km
i	=	interest rate per month, expressed as decimal
($E_{I\%}$PW,i%,12n)	=	factor to convert an exponential series that grows at a rate of I % per month for a period of 12n months to its present worth at an interest rate of i % per month.

This factor is given below.

$$E_{I\%}PW,i\%,12n) = \frac{((1+I)/(1+i))^{(12n+1)} - 1}{(1+I)/(1+i) - 1} - 1$$

where the terms have the meaning explained above.

The following input values were used:

Current price of new truck	=	$90 000
Lifetime distance	=	800 000km
Inflation rate	=	10 percent p.a.
Cost of capital	=	20 percent p.a.

This resulted in the following estimates for capital cost (see Tables A.1 and A.2):

Previously:	$0,1611 per vehicle km
Now:	$0,1500 per vehicle km.

The new value for capital cost per truck kilometer implies a saving of almost 7 percent in capital cost relative to the base case.

Balance of fixed cost

The "balance of fixed cost" (i.e., total fixed cost minus capital cost, which is calculated separately) at an annual distance of 93 996 km and 120 106 km per year respectively is calculated in Tables B.1 and B.2 below. From these tables the following emerges:

Balance of fixed cost:

Previously:	$0,2953 per vehicle km
Now:	$0,2311 per vehicle km.

The increased distance traveled per annum therefore implies a saving of almost 23 percent relative to the base case.

Table A.1: Breakdown of Total Cost per Vehicle Kilometer: 93 996 km p.a.

Annual distance (km)			93996
Item	**Cost/year**	**Cost/veh km**	**% of total cost**
Fixed cost			
Insurance	6840	0.0728	8.9
On-vehicle staff	14280	0.1519	18.6
Overheads: Administration	3402	0.0362	4.4
Overheads; Operational	2268	0.0241	2.9
Licence	968	0.0103	1.3
Other	0	0.0000	0.0
Sub-total	27757	0.2953	NA
Vehicle capital cost	NA	0.1611	19.7
Total fixed cost	NA	0.4564	55.8
Variable cost			
Fuel	NA	0.2391	29.2
Lubricants	NA	0.0060	0.7
Maintenance	NA	0.0676	8.3
Tyres	NA	0.0490	6.0
Other	NA	0.0000	0.0
Total variable cost	NA	0.3618	44.2
Total cost of operations	NA	0.8182	100.0

Note: Compiled from information contained in Vehicle Cost Schedule (October 2000) of the Road Freight Association of South Africa

Table A.2: Breakdown of Total Cost per Vehicle Kilometer: 120 106 km p.a.

Annual distance (km)			120106
Item	**Cost/year**	**Cost/veh km**	**% of total cost**
Fixed cost			
Insurance	6840	0.0569	7.7
On-vehicle staff	14280	0.1189	16.0
Overheads: Administration	3402	0.0283	3.8
Overheads; Operational	2268	0.0189	2.5
Licence	968	0.0081	1.1
Other	0	0.0000	0.0
Sub-total	27757	0.2311	NA
Vehicle capital cost	NA	0.1500	20.2
Total fixed cost	NA	0.3811	51.3
Variable cost			
Fuel	NA	0.2391	32.2
Lubricants	NA	0.0060	0.8
Maintenance	NA	0.0676	9.1
Tyres	NA	0.0490	6.6
Other	NA	0.0000	0.0
Total variable cost	NA	0.3618	48.7
Total cost of operations	NA	0.7428	100.0

Note: Compiled from information contained in Vehicle Cost Schedule (October 2000) of the Road Freight Association of South Africa

Other costs

Insurance:
Previously: $0,007 per truck km
Now: $0,005 per truck km.

Stocks-in-transit:
Previously: $0,021 per truck km
Now: $0,015 per truck km

Facilitation fee:
Previously: $0,007 per truck km
Now: $0,005 per truck km.

Total:
Previously: $0,035 per truck km
Now: $0,025 per truck km.

APPENDIX A.1.3
ROAD TRANSPORT: LOW TRAVEL SPEEDS

Balance of fixed cost

Average travel speed = 2 611/207-60)
= 17,76 km/h

Assume this to be increased to 50 km/h (= optimum speed).

Duration of return trip therefore:

Previously:	(60+2 611/17,76+18)*2)	=	450 hours
Now:	((60+2 611/50+18)*2	=	260 hours

Number of return trips per annum:

Previously:	365*24*0,9/450	=	18
Now:	365*24*0,9/260	=	30

Distance traveled per annum:

Previously:	18*2 611 *2	=	93 996 km
Now:	30*2 611 *2	=	156 660 km.

This results in the following for "balance of fixed cost":

Previously:	$0,2952 per truck km
Now:	$0,1772 per truck km.

Vehicle operating cost

Vehicle operating cost as a function of travel speed was calculated by using the functions given below, as contained in program COSTDATA of CSIR (Transportek).

$$FTS = 258,0 + \frac{14597,7}{V} - 9,4320 * V + 0,12023 * V^2$$

where:

FTS	=	fuel cost in liters per 1 000 truck km
V	=	travel speed in km/h

$$TTS = 2,70286 + 0,02928 * V - 0,00066795 * V^2 + 0,00000299 * V^3 \; (V \leq 100 \; km/h)$$

where:

TTS	=	tire cost per 1 000 truck km as a portion of the cost of a set of new tires
V	=	travel speed in km/h

$$OTS = 3,06 + 0,0021 * FTS_{HGVs}$$

where:

OTS = oil cost in liters per 1 000 truck km
FTS_{Trucks} = fuel cost in liters per 1 000 truck km for trucks

$$CC = \frac{1}{[-7,754863 + 6,9862775 * V^{0,40980399}]}$$

where:

CC = capital cost per 1 000 truck km as portion of the cost of a new truck
V = travel speed in km/h

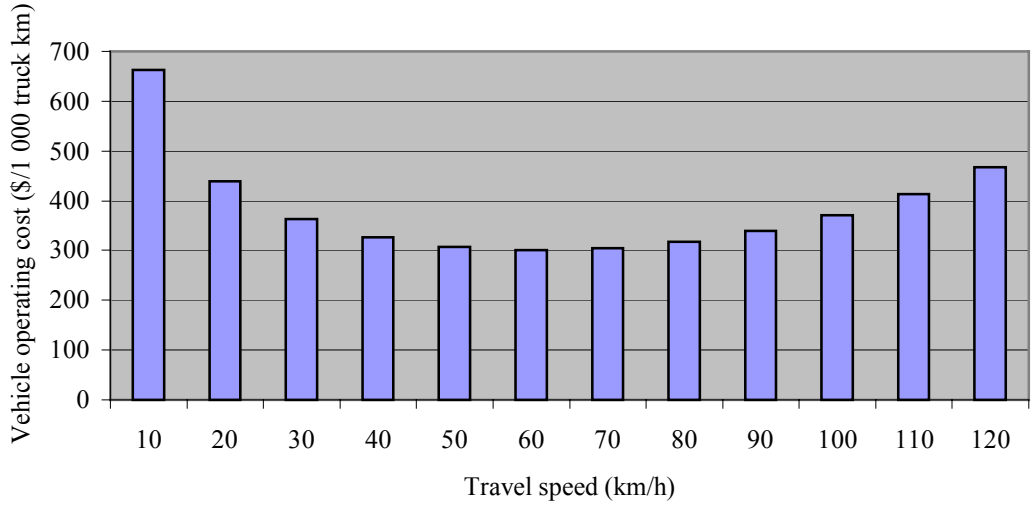
$$MTC = 0,98925725 * 1,0202826^{V} * V^{-0,85947835}$$

where:

MTC = maintenance cost per 1 000 truck km as a portion of the cost of a new truck
V = travel speed in km/h.

Figure A.1 below shows the total of these costs in monetary terms. It shows that optimum travel speed (where vehicle operating cost is minimized) is between 50 and 79 km/h.

Figure A.1: Vehicle operating cost as affected by travel speed



Increasing travel speed from approximately 18 km/h to 50 km/h therefore implies a reduction of vehicle operating cost from $0,439 to $0,307 per truck km. Given this ratio and assuming a 70/30 percent variable/fixed cost, it means that variable cost (including capital cost) can be reduced from $0,914 to $0,639 per vehicle kilometer.

Other costs

Insurance:
Previously: $0,007 per truck km
Now: $0,005 per truck km.

Stocks-in-transit:
Previously: $0,021 per truck km
Now: $0,015 per truck km

Facilitation fee:
Previously: $0,007 per truck km
Now: $0,005 per truck km.

Total:
Previously: $0,035 per truck km
Now: $0,025 per truck km.

APPENDIX A.1.4
ROAD TRANSPORT: ROAD CONDITION

General

Assume 100 percent of road is in poor condition. This adds 10 percent to vehicle operating cost (CB-Roads and HDM), and reduces travel speed by 10 percent from 20 km/h to 17,76 km/h.

Balance of fixed cost

Duration of return trip therefore:

Previously:	(60+2 611/17,76+18)*2)	=	450 hours
Now:	((60+2 611/20+18)*2	=	417 hours

Number of return trips per annum:

Previously:	365*24*0,9/450	=	17,5
Now:	365*24*0,9/417	=	19,0

Distance traveled per annum:

Previously:	17,5*2 611 *2	=	91 385 km
Now:	19,0*2 611 *2	=	99 218 km.

This results in the following for “balance of fixed cost”:

Previously:	$0,3037 per truck km
Now:	$0,2798 per truck km.

Vehicle operating cost

Previously:	1,306*70%	=	0,9142
Now:	1,306*70%*0,85%	=	0.7771.

Other costs

Insurance:

Previously:	$0,009 per truck km
Now:	$0,008 per truck km.

Stocks-in-transit:

Previously:	$0,025 per truck km
Now:	$0,023 per truck km

Facilitation fee:

Previously:	$0,009 per truck km
Now:	$0,008 per truck km.

Total:

Previously:	$0,043 per truck km
Now:	$0,039 per truck km.

APPENDIX A.1.5
ROAD TRANSPORT: INCREASE VOLUMES

Calculations

24/30,48 ton	=	78,74 percent payload utilization		
Assume: Percentage annual laden km:				
Previously:	=	60 percent		
Now:		75 percent.		
Therefore: Total utilization factor:				
Previously:	=	78,74%*60%	=	47,24%
Now:	=	78,74%*75%	=	59,06%
Cost per vehicle km at 100 000 km per annum		=		$0.1580
Cost per ton km:				
Previously:	0,1580/(30,48*47,24%)		=	$0,0110
Now:	0,1580/(30,48*59,06%)		=	$0,0088
Ratio:	0,0110/0,0088	=	0,7974	

APPENDIX A.2
RAIL TRANSPORT

Assumptions

Current situation (= base case)

- Rail volume from Zambia DRC: 15 000 ton per annum (10 trains)
- Rail volume from Zimbabwe: 700 000 ton per annum
- Transit time from DRC/Lubumbashi: 10 to 15 days
- Port volume, excluding oil: 750 000 ton per annum

Increased rail volumes

- Volume: Increasing to 100 000 ton per annum, serving copperbelt: 12m + $3 600

Increased railway competition

- Short term productivity increase – tariff reduction: 10 percent

Reduced standing times

- Reduction of four days at $30 (*2) per 12 meter container as a result of reduced risk

Increased rail operating speeds

- Increase operating speed from 30 to 60 km/h in Zambia and DRC = 35 hours

Increased port volumes

- Increase of 10 percent in productivity

Seamless border operations

Save two days transit time plus admin and management costs: $120.

Example of Transit Time Cost Implication

Previous railway transit time (1996), Ndola – Beira, 2337km	30days
Present (2001) improved transit time, Ndola – Beira :	7 to 10 days
Private sector managed time Ndola – Durban, 2967km:	7days
Private sector managed time Gauteng Kidatu, 3460km:	7 – 10 days

Cost implication of Transit time saving of 5 days:
Train: One mainline locomotive per 20 loaded wagons
Locomotive $700/day – assume 50% dedication
Wagons $12/day – standard interchange rate, not commercial hire rate, which is higher.
Total fixed cost of train = $590/day = $29.50/container/day
Cost of 5 days transit time = $147/contaner
Total gross freight volume 20x38tons, alternatively 24 ton, 12m container
Total freight carried on train = 400tons (12 m containers)
Assumed railway transport cost $3200/container (Gauteng – Kidatu).

APPENDIX B
INTERVIEW RESULTS: RANKING OF FACTORS CONTRIBUTING TO HIGH COST

General

For all questions, an analysis of variance (ANOVA) was done using both the Bonferroni t-tests of differences between means and the Gabriel's multiple-comparison test procedure in order to test whether those perceived variables with higher means were in fact significantly higher than the means of other perceived variables. Both tests gave the same results. Results of the ANOVA and Gabriel's multiple comparison tests are given in the appendix but a summary of analyses are given below. Where results show no significant difference between mean scores of two issues/constraints/actions, it does not necessarily mean that no difference exists but that the difference, if any, is not large enough to be detected with the given sample size. Significance tests are based on an alpha level of 0.05.

Note that the Bonferroni 's t-test and the Gabriel's multiple comparison's test is just some of the number of options for performing multiple comparison's tests. Any of the options could have been used as they all produce the same results. Four different options namely: GT2, SMM, BON, GABRIEL were used to perform the comparisons and they all produced the same result.

- GT2 & SMM – Performs pairwise comparison's based on the studentized maximum modulus and Sidak's uncorrelated-t inequality for all main effect means in the MEANS statement.
- BON – performs Bonferroni t-tests of difference between means for all main effect means in the MEANS statement.
- GABRIEL – performs Gabriel's multiple- comparison procedure on all main effect in the MEANS statement.

Table B.1: Road Transport

Q	Issue	Mean	Std Dev
p	Border post issues (e.g., delays, documentation, procedures etc).	3.77	0.43
t	Physical road conditions	3.50	0.60
q	Cost of spare parts (especially if paid for in foreign currency)	3.41	0.59
a	Inadequate capacity for industry regulators and service providers to enforce required standards	3.36	0.73
d	Lack of resources to continually analyse policy issues for economic management in trade and transportation	3.23	0.69
b	Inadequate legislation and enforcement to enhance road safety	3.18	0.80
e	Lack of a database that should provide a flow chart to enable stakeholders to review the barriers and achievement as they tackle them	3.09	0.68
j	Lack of or inappropriate policies to deal with domestic/internal distribution aspects that affect the final costs of products to the consumer (i.e., trunk and secondary road connectivity and operation modalities)	3.09	0.87
s	Capacity limitations in the road transport infrastructure	3.00	0.69
k	The existence of institutionalized corruption in the industry that leads to excessive infrastructure development and maintenance costs	3.00	0.77
f	Slow processes in the creation of autonomous road agencies and boards to management road funds and to ensure coordinated road development and maintenance	2.95	0.72
g	Lack of private sector participation in road infrastructure development, ownership and operation	2.86	0.77
c	Lack of regionally established policy framework under which government and the private sector should delivery road infrastructure and related services	2.86	0.64
n	Lack of independent forums where policy makers, practitioners, the inter-government organisations and business people discuss on equal footing	2.86	0.83
l	Lack of well established regional associations that can lobby government across national borders	2.82	0.91
o	Inadequate independent in-country forums that can monitor and lobby for policy change without disrupting economic activity	2.68	0.84
r	The industry being dominated by a few players	2.63	0.73
m	The existence of cabbotage in the industry that leads to idle capacity	2.45	1.26
h	Lack of publicly known road maintenance standards that would attract public support during times of need	2.36	0.90
i	Lack of appropriate mechanisms to use national security forces for infrastructure development and maintenance	2.09	0.81

The groupings based on significance as shown in the results in the appendix do indicate some statistical differences. Although the first 11 issues given in the table above were not significantly different from each other, there were some other significant differences between mean scores of pairs of issues. For instance, the issue in Question 2p which has the highest mean score, was rated significantly higher than those issues captured in the last 9 questions, namely; 2g, 2c, 2n, 2l, 2o, 2r, 2m, 2h and 2i. The mean scores of question 2t, 2q and 2a were also significantly higher than that of questions 2m, 2h and 2i, with 2t also being higher than 2r. The issue given in question 2i, which had the lowest mean score, was significantly lower than the issues given in the first 11 questions. There were a few other pairwise comparisons of issues that were significantly different from each other, but all are captured in the output given in the appendix.

Table B.2: Rail Transport

Q2	Issue	Mean	Std Dev
n	Overloading in competing modes	3.57	0.79
p	Lack of parity /flow in traffic(i.e flow is one directional	3.57	0.79
o	Distances between Origin and Destination	3.43	0.79
h	Inappropriate tax systems that may enable the rail industry to subsides roads	3.43	0.53
b	Inadequate railway inter networking arrangements	3.28	0.75
a	Inadequate support and enhancement of the implementation of transportation policy change programmes and recommendations(from the national and regional institutions)	3.14	0.69
g	Lack of cost reduction policies coupled with inefficient management systems	3.14	1.07
m	Inappropriate business focus due to state dominance(or legacy) in the industry	3.00	1.00
i	Lack of effective regulatory institutions	2.86	0.69
j	Lack of infrastructure maintenance culture that precipitates to poor operational performance	2.86	1.07
c	Inappropriate railway interfacing with other modes that inhibits mode complimentary and competition	2.86	0.38
k	Lack of environmental pollution policies that can be effectively enforced for the benefit of other social services.	2.71	0.95
d	Misplacement of heavy cargo to road hauliers due to railway limitations	2.57	0.79
f	Slow restructuring and concessioning processing limiting private sector involvement in the industry	2.43	1.51
e	Lack of adequate cargo tracking systems in railways	2.43	1.27
l	Lack of known performance indicators that can aid arbitration during conflicts	2.43	0.79

No significant difference was detected between any of the mean scores.

Table B.3: Inland Water and Sea Transport

Q2	Issue	Mean	Std Dev
h	Low port efficiency in most ports that do not match the just in time (JIT) principle of doing business	4.00	0.00
c	Lack of proper forums to promote regional shipping lines in partnership with major international lines	3.50	0.71
j	Weak management practices and very slow concessioning/privatization implementation in ports.	3.50	0.71
f	Inadequate shipping services and capacity in major lakes and rivers .This is further complicated by the poor interface between inland waterways and other modes of transport.	3.50	0.71
a	Low cargo available in the region due to inability to consolidate available cargo	3.00	1.41
g	Shippers experience high costs of handling containers due to container overstay and high demurrage charges	3.00	1.41
b	There is low capacity building for shippers organisations	3.00	1.41
e	Coastal services dominating traffic to ports due to hub and spoke principle coupled with the super large vessel development that has left many of the port wanting by way of infrastructure and facilities or such ships.	2.50	0.71
k	Cross subsidies among different berths between general cargo berths and container terminals that is costly to efficient operations per berth	2.50	0.71
d	Low indigenous private sector participation I the industry	2.50	2.12
i	Inadequate pollution control standards that engenders marine life and hence resource that can support trade.	1.00	1.41

The sample size is too small (only 2 questionnaires) to properly carry out significance tests for marine transport.

Table B.4: Air Transport

Q2	Issue	Mean	Std Dev
g	High domestic and regional air transport costs in comparison to those charged on international routes, e.g., Southern Africa to/from Europe.	3.60	0.55
a	The cost (either through, buy, lease or hire) of equipment and facilities of the aviation industry it too high and this precipitates into high airline costs that inhabit expansion of service.	3.40	0.55
j	Regional connectivity in the airline industry	3.20	0.45
k	The need to remunerate key personnel key personnel (e.g., pilots, aviation, mechanics) at international rates due to the high mobility/demand for such personnel.	3.20	0.84
d	Adhering to international safety standards/requirements and the impact that these and their associated new technologies may have on regional air safety and existing ground facilities.	3.00	0.71
f	The need for dedicated air cargo services in the region to maximise economies of scale.	3.00	0.00
e	Current airline capacity utilization in the region	3.00	0.71
b	Lack of a comprehensive report on the progress made so far in restructuring and privatisation of the region's airlines to gauge performance (and share achievements) to date.	3.00	0.71
i	The regulative civil aviation environment	3.00	0.71
h	Regional connectivity in the airline industry	2.80	0.45
c	The need to remunerate key personnel (e.g., pilots, aviation mechanics) t international rates due to the high mobility/demand for such personnel.	2.60	1.14

There were only 5 questionnaires for question 3 of air transport, which is a small sample. The tests indicated no significant difference between any of the mean scores.

Table B.5: Pipelines

Q2	Issue	Mean	Std Dev
a	The state of ownership that affects the service costing for commodities delivered	3.00	1.00
b	Safety requirement and procedures	3.00	1.00
c	Current cost features (as it is assumed that the carrying of liquids by road or rail may be more expensive, yet transporters still use these modes rather than pipeline)	3.00	1.00
d	Oil distribution and the impact of middlemen influencing intermediary costs	3.00	1.00
e	Interfacing of all terminals	2.67	0.58
f	The physical state of the pipeline infrastructure	2.33	1.15

The sample size is too small to properly carry out significance tests for pipeline transport.

APPENDIX C
STAKEHOLDER RESEARCH METHODOLOGY

STAKEHOLDER INTERVIEWS

Objectives of interviews

There is a perception that transport costs are high within the region and along a number of key transport corridors that traverse the region. Therefore the exact nature of these perceptions needed to be ascertained and this was done by conducting interviews with key stakeholders in the region. The objectives of the study visits are be stated as follows:

- To personally meet with key stakeholders in the region and build relationships with them
- To identify key stakeholders in the region that are affected by transport costs and transport system bottlenecks
- To gather documents/reports (we have details of over 300 reports/studies conducted on transport in our database and need to acquire hard or electronic copies)
- To ascertain and understand stakeholders views as to why recommendations that have been tabled (from past protocols, consultants reports, etc.) to remedy the situation have not been implemented or are slow in being implemented.

Countries visited

The countries visited in terms of the study were as follows:

- Botswana
- Malawi
- Mozambique
- Namibia
- South Africa
- Tanzania
- Zambia
- Zimbabwe.

It should be noted that the countries listed above to be included in the study tour (some of which are in the SADC and/or COMESA economic blocks) were specifically requested by the client in the project SOW.

Interview methodology

The study tour methodology can be stated as follows:

- A team of two CSIR staff visited each of the countries.
- An introductory letter was sent to key stakeholders in each country advising them of the study.
- A desktop approach was used initially to identify key stakeholders in each country. Resources such as address lists and attendance records from meetings held in the region were used to effect this.
- A key contact in the Ministry of Transport and Communications in each of the study tour countries was identified. This contact usually had a better understanding of who the key stakeholders are in his/her country and this made it easier for the study team to obtain an interview.

- With respect to stakeholders, CSIR staff tried to target the Chief Executive Officers (CEOs) of each organization where possible.
- Appointments were made with the stakeholders on arrival in each country.
- The study team spent between 4 and 5 days in each country.

Interview timetable
The timetable followed to conduct the study tour was as follows:

COUNTRY	DATES (FROM – TO)
Botswana	Monday 14 – Thursday 17 May 2001
Malawi	Monday 30 July to Thursday 2 August 2001
Mozambique	Monday 21 – Thursday 24 May 2001
Namibia	Monday 7 – Thursday 10 May 2001
South Africa*	
Tanzania	Monday 16 to Thursday 19 July 2001
Zambia	Wednesday 4 – Friday 6 July 2001
Zimbabwe	Monday 4 – Friday 8 June 2001

*In the case of South Africa, interviews with key stakeholders took place simultaneously at various times in the periods indicated above.

ELECTRONIC SURVEY

1.1 Objective of electronic survey

The main focus of the survey was to obtain responses from private sector stakeholders, who represented, transport service providers, professional associations or users. The questionnaires were mode specific, therefore the road questionnaire was sent to stakeholders in the road industry. Potential respondents were those already interviewed or consulted personally during the interview phase of the study.

Electronic Survey Methodology
This method of surveying respondents, primarily relied on questionnaires, which were distributed electronically (e.g., email and/or fax). When clarity was required by respondents this was obtained by telephone, fax or email. The survey process followed was as follows:

- The design of the survey form was an exercise requiring input from both the consultant and the client. This was to ensure that the questionnaire collected information that would fulfil the client's needs.
- The questionnaire filled two A4 pages. It was deliberately made to fit two A4 pages in order not to appear to be too long and thereby not be seen by the respondent to intrude on their time.
- Questions asked in the survey form were based on issues raised in the scope of work (these will be presented later in this chapter).
- As the survey was to analyse responses in a scientific way, it was necessary to have some form of numerical ranking of respondents responses. This was achieved by having four

categories of responses; namely, strongly agree, agree, disagree and strongly disagree. To each of these responses a numeric value was given, 4 being the highest (strongly agree) to 1 being the lowest (strongly disagree).

- Questionnaires were sent primarily by email and if no email address was available for the potential respondent a fax was sent.
- A follow up telephone call was made to each potential respondent to confirm that they had indeed received the questionnaire and to encourage them to respond.

Electronic survey questionnaire structure

1.2 The questionnaires contained 4 primary questions. These were:

1. Country where the respondent lived/worked
2. Issues (perceptive variables) which influenced transport costs
3. Constraints in implementing COMESA/SADC initiatives to improve the transport system in the southern African region.
4. Action plans which could be used to accelerate the implementation of COMESA/SADC initiatives to improve the transport system in the southern African region

Questions 2 to 4 were broken down into sub questions, the number of which varied according to mode. Questions 1, 3 and 4 were the same for all modes, only sub-question 2 was mode specific. Questionnaires were designed according to the following modes:

- Road
- Rail
- Marine/Ports/Inland Waterway
- Air/Civil Aviation
- Pipeline

Electronic survey response analysis

On receipt of the responses from stakeholders the following statistical analyses (in order to determine the ranking of perceptive variables and their importance) were conducted:

- Mean
- Standard Deviation
- Analysis of Variance (ANOVA)

The analyses are defined as follows:

- Mean

Mean is taken to be the arithmetic average of a group of observations. In other words, if four respondents all strongly agreed (i.e., score = 4) with a perceptive variable, the mean would be 4. Take for example Table 4.3 (in the main report). The summing of the perceptive variable scores (harmonization of legislation and policies), rated by each of the respondents is then divided by the number of respondents (there were two in this case). In other words, (4 + 4)/2 = 4.

- Standard Deviation

Is an indicator of the extent of spread of all the observations (in this case perceptive variable scores) about the mean. In statistical terms the standard deviation is the square root of the variance.

- Analysis of variance

The analysis of variance (ANOVA) is a method that tests the hypothesis that there is no difference between the means (derived from the observations). ANOVA can be used to determine the variability between each mean and the variability of each mean to the group mean.

APPENDIX D
NAMES AND CONTACT DETAILS OF PERSONS INTERVIEWED/CONSULTED

Mr. S W Batshogile
Chief Technical Officer: Traffic Section
Botswana Ministry of Works, Transport & Communications: Roads Department
Private Bag 0026, Gaborone, Botswana
BOTSWANA
Tel: 267 313 511
Fax: 267 314 278
Email: sebolai@bigfoot.com

Mr. Lovemore Bingandadi
Project Manager
United States Agency for International Development, Regional Centre for Southern Africa
PO Box 2427, Gaborone, Botswana
BOTSWANA
Tel: 267 324 449
Fax: 267 324 404
Email: lbingandadi@usaid.gov

Mr Rory Downey
Deputy Team Leader (Chemonics)
Regional Activity to Promote Integration Through Dialogue and Policy Implementation
PO Box 602090, Gaborone, Botswana
BOTSWANA
Tel: 267 300 884
Fax: 267 301 027
Email: rdowney@chemionics-rapid.com

Dr. Lucas Gakale
Permanent Secretary
Ministry of Works, Transport & Communications, Botswana
Private Bag 007, Gaborone, Botswana
BOTSWANA
Tel: 267 358 504
Fax: 267 358 504
Email:

Mr Willem Goeiemann
Senior Economist
Southern African Development Community, Botswana
Private Bag 0095, Gaborone, Botswana
BOTSWANA
Tel: 267 351 863
Fax: 267 372 848
Email: willemg@sadc.int

Mr Obusitswe B Keitheile
Senior Roads Engineer
Ministry of Works, Transport & Communications-Roads Department, Botswana
Private Bag 0026, Gaborone, Botswana
BOTSWANA
Tel: 267 313 511
Fax: 267 314 278
Email: okeitheile@gov.bw

Ms. Ita Mannathoko
Economic Policy Advisor
IMPACT (Project sponsored by USAID, operated by AURORA Associates International Inc)
Private Bag BO 327, Bontleng, Gabarone, Botswana
BOTSWANA
Tel: 267 373 969
Fax: 267 373 936
Email: itam@impact.info.bw

Ms. K Matu
Technical Officer
Ministry of Works, Transport & Communications-Roads Department, Botswana
Private Bag 0026, Gaborone, Botswana
BOTSWANA
Tel: 267 313 511
Fax: 267 314 278
Email: sebolai@bigfoot.com

Mr. M R Mondira
Business Manager (South)
Botswana Railways
Private Bage 00125, Gaborone, Botswana
BOTSWANA
Tel: 267 351404 / 267 351401
Fax: 267 319187
Email: bussmansouth@botsnet.bw

Mr Ken Morris
Director
Department of Customs and Excise, Botswana
Private Bag 0041, Gaborone, Botswana
BOTSWANA
Tel: 267 322 129
Fax: 267 322 781
Email:

Mr. B G Mpetlhe
Principal Economist
Ministry of Works, Transport & Communications, Botswana
Private Bag 007, Gaborone, Botswana
BOTSWANA
Tel: 267 35 8546
Fax: 267 31 3303
Email: bmphetglhe@gov.bw

Mr Johan Oberholzer
First Secretary: Political
South African High Commission, Botswana
Kopanyo House, Nelson Mandela Drive, Plot 5131, Gaborone, Botswana
BOTSWANA
Tel: 267 304 800/1/2/3
Fax: 09267 305501
Email: sahcgabs@botsnet.bw

Dr Prega Ramsamy
SADC Secretariat
Southern African Development Community, Botswana
Private Bag 0095, Gaborone, Botswana
BOTSWANA
Tel: 267 35 1863
Fax: 267 372 848
Email:

Dr P Ravindran
Principal Air Transport Officer
Department of Civil Aviation, Botswana
PO Box 250, Gaborone, Botswana
BOTSWANA
Tel: 267 3055213
Fax: 267 303348
Email: pravindran@gov.bw

Mr James W Robertson
Market Integration Advisor
Regional Activity to Promote Integration Through Dialogue and Policy Implementation
PO Box 602090, Gaborone, Botswana
BOTSWANA
Tel: 267 300884
Fax: 267 301027
Email: tradepolicy@info.bw

Mr Vincent Sandamuka
Project Manager
United States Agency for International Development, Regional Centre for Southern Africa, Office of Regional Market Integration
PO Box 2427, Gaborone, Botswana
BOTSWANA
Tel: 267 324 449
Fax: 267 324 404 / 267 564 286
Email: vsandamuka@usaid.gov

Mr Moses K Sebolai
Director
Department of Road Transport and Road Safety, Botswana
Private Bag 0054, Gaborone, Botswana
BOTSWANA
Tel: 267 308390
Fax: 267 300930
Email: sebolai@bigfoot.com

Ms Beatrice M Selotlegeng
Deputy General Manager
Air Botswana
PO Box 92, Gaborone, Botswana
BOTSWANA
Tel: 267 352 812 / 267 356 037
Fax: 267 375408
Email: bselotlegeng@airbotswana.co.bw

Mr Martin Silongo
President
Exporters' Association of Botswana
Private Bag 167, Gaborone, Botswana
BOTSWANA
Tel: 267 311 883/4
Fax: 267 311 001
Email: eaob@exporters.bw

Mr Mike Steel
Regional Director - Botswana
Unitrans
PO Box 426, Gaborone, Botswana
BOTSWANA
Tel: 0 267 58 6229
Fax: 267 35 9887
Email: mikes@unitrans.co.za

Mr. BS Tamari
Corporate Planning Manager
Botswana Railways
Private Bag 0052, Mahalapye, Botswana
BOTSWANA
Tel: 267 41 1375 ext 7381 / 267 411390
Fax: 267 41 1385
Email: bstamari@botrail.bw

Mr Evans Twaambo
Administration Manager
Seabelo's Express (Bus Hiring)
PO Box 1837, Gaborone, Botswana
BOTSWANA
Tel: 357078
Fax: 357077
Email: seabelo@global.bw

Mr. Joseph Willie
Transport Economist
Ministry of Works, Transport & Communications, Botswana
Private Bag 007, Gaborone, Botswana
BOTSWANA
Tel: 267 35 8537
Fax: 267 31 3303
Email: jwillie@gov.bw

Mr. Olivier Hartmann
Secretary General
Port Management Association of Eastern and Southern Africa
PO Box 99209, Mombasa, Kenya
KENYA
Tel: 254 11 223 245
Fax: 254 11 228 344
Email: pmaesa@africonline.co.ke

Ms Kitiabi Kiti
Regional Trade Program Specialist/Advisor
United States Agency for International Development (Regional Economic Development Services Office/East and Southern Africa)
PO Box 30261, Nairobi, Kenya
KENYA
Tel: 254 2 862400 X2336
Fax: 254 2 860949 / 860870
Email: mkitiabi@usaid.gov

Mr. Mkumbu Mulinge
Senior Agriculture Policy Analyst
United States Agency for International Development (Regional Economic Development Services Office/East and Southern Africa)
PO Box 14821, Nairobi
KENYA
Tel: 254 2 862 400 X2336
Fax: 254 2 860949 / 860870
Email: mmulinge@usaid.gov

Mr. Timothy Oketch
Technical Assistant
Technoserve
PO Box 14821, Nairobi, Kenya
KENYA
Tel: 254 2 44 0682
Fax: 254 2 440 682
Email: Technos1@africaonline.co.ke

Mr. Godfrey Matata Onyango
Executive Secretary
Permanent Secretariat of the Transit Transport Coordination Authority of the Northern Corridor
PO Box 95341, Mombasa, Kenya
KENYA
Tel: 225955-8 / 228422/3 / 221975 X4241/4271
Fax: 254 11 311 572
Email: ttca@africaonline.co.ke

Mr Wilfred Ali
Project Manager Nacala Development Corridor
Ministry of Transport and Public Works
Private Bag 322
Lilongwe
MALAWI
Tel: 265 834 269 / 265 761 191
Fax: 265 833 936 / 265 761 584
Email: timigra@eomw.net

Mr Kedron Chisale
Principal transport economist
Ministry of Transport & Public Works, SSC Railways, Malawi
Private Bag X322, Lilongwe 3, Malawi
MALAWI
Tel: 265 789 377
Fax: 265 789 005
Email: tmkaunda@eomw.net

Mr. Samuel Chkapusa
Senior transport planning officer
Ministry of Transport, Malawi
Private Bag 322, Lilongwe 3, Malawi
MALAWI
Tel: 265 789 377
Fax: 265 789 005
Email: tmkaunda@eomw.net

Mr. Gomezga J Chunda
Technical Director: Central Planning Division
National Roads Authority, Malawi
Private Bag B346, Lilongwe 3, Malawi
MALAWI
Tel: 265 753 699
Fax: 265 750 307
Email: gchunda@nra.sdnp.org.mw

Mr Ricardo A Daniel
Chief Transportation Officer
The Central East African Railways Company Limited
PO Box 5144, Limbe, Malawi
MALAWI
Tel: 265 640 844 X 3399/3471 / 265 640 771 (dir)
Fax: 265 643 496
Email: rdaneil@sndp.org.mw

Mr Richard E Kamphale
General Manager
Petroleum Importers Ltd
Private Bag 200, Blantyre, Malawi
MALAWI
Tel: 265 623214
Fax:
Email: Petroeum1@malawi.net

Mr Benjamin C Kapoteza
Technical Director: Urban & District Roads
National Roads Authority, Malawi
Private Bag B346, Lilongwe 3
MALAWI
Tel: 265 753 699 / 265 752 275 / 265 752 656 (direct)
Fax: 265 750 307
Email: bkapoteza@nra.sdnp.org.mw

Mr. Tomics Michael Kaunda
National Coordinator
Ministry of Transport, Malawi
Private Bag 322, Lilongwe 3, Malawi
MALAWI
Tel: 265 789 377
Fax: 265 789 005
Email: tmkaunda@eomw.net

Mr. Bradley J Knapp
General Manager
The Central East African Railways Company Limited
PO Box 5144, Limbe, Malawi
MALAWI
Tel: 265 640 844 X3221 / 3324
Fax: 265 643 496 / 640 683
Email: bknapp@sdnp.org.mw

Mr. C K Kumangirana
Director: Roads
Ministry of Transport & Public Works, Malawi
Private Bag 316, Capital City, Lilongwe, Malawi
MALAWI
Tel: 265 789 377 / 265 788 092 (dir)
Fax: 265 789 328
Email: tmkaunda@eomw.net

Mr. L F N Kumwenda
Manager: Operations / Marketing
Malawi Cargo Centres Ltd (Northern Corridor)
PO Box 30642, Capital City, Lilongwe 3, Malawi
MALAWI
Tel: 756 112 / 254 / 252
Fax: 753 237
Email: malawicargo@eomw.net

Mr. Alberto E Leiva
Assistant General Manager: Operations & Commercial
The Central East African Railways Company Limited
PO Box 5144, Limbe, Malawi
MALAWI
Tel: 265 640 844 X3292 / 265 643 895 (dir)
Fax: 265 643 496
Email: aeleiva@sdnp.org.mw

Mr. Dauphin E Makako
Chief Executive & RMI Country Coordinator
National Roads Authority, Malawi
Private Bag B346, Lilongwe 3, Malawi
MALAWI
Tel: 265 753 699 / 752 276 / 750 707 (dir)
Fax: 265 750 307
Email: mkachapila@nra.sdnp.org.mw

Mr. Shadrack Matsimbe
Executive Director
Road Transport Operators' Association, Malawi
PO Box 30740, Blantyre 3, Malawi
MALAWI
Tel: 265 670 422
Fax: 265 671 423
Email:

Mr. Brebner S Mhango
Principal transport planning officer
Ministry of Transport, Malawi
Private Bag 322, Lilongwe 3, Malawi
MALAWI
Tel: 265 789 377
Fax: 265 789 005
Email: tmkaunda@eomw.net

Mr. Vincent Mpaluko
General Manager
Malawi International Transport Company
PO Box 30545, Lilongwe 3, Malawi
MALAWI
Tel: 265 773 955/939
Fax: 265 774 827
Email: mitcoltd@malawi.net

Mr. Stallard Mpata
General Manager
Malawi Cargo Centres Ltd (also SATCC consultant)
PO Box 30642, Lilongwe 3, Malawi
MALAWI
Tel: 265 756 112
Fax: 265 753 627 / 756 115
Email: malawicargo@eomw.net

Mr. Goa Nyasulu
Principal Transport and Energy Economist: Ministry of Economic Planning & Development, Malawi
Mphizi Consulting Engineers
PO Box 30204, Lilongwe 3, Malawi
MALAWI
Tel: 265 752 060
Fax: 265 782 224
Email:

Mr. Christopher Tembo
Freight Manager
Malawi International Transport Company
PO Box 30545, Lilongwe 3, Malawi
MALAWI
Tel: 265 773 955/939
Fax: 265 774 827
Email: mitcoltd@malawi.net

Mr. Boventura Cherinda
Finance Director
CFM
PO Box 2158, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 422 238
Fax: 258 1 422 238
Email: cherinda@cfmnet.mz

Mr Paulo Fumane
Coordinator
Nacala Development Corridor
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 06 215620
Fax: 06 215621
Email: p.fumane@teledata.mz

Mr Tim Hansford
Chief Executive
Maputo Port Development Company
CP 2158
Direccao do Porto Maputo
MOZAMBIQUE
Tel: 258 1 312 062 / 258 1 312 063 / 258 1 312 064
Fax: 258 1 497 699
Email: mpdc@cfmnet.co.mz

Ms Teresa Jeremias
National Coordinator and SATCC Contact Point
Ministry of Transport & Communication, Mozambique
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 42 0497
Fax: 258 1 430 152
Email: jeremias@teledata.mz

Dr. Charles Kunaka
Senior Policy Officer - Transport
SATCC
CP 2677
Maputo
Mozambique
MOZAMBIQUE
Tel: 258 1 420214 / 258 1 420246
Fax: 258 1 420213 / 431288
Email: kunaka@satcc.org

Mr Miguel J Matabel
Executive Board Director
Mozambique Ports and Railways
PO Box 2158, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 431 714
Fax: 258 1 427 746
Email: matabel@cfmnet.co.mz

Dr Constantino J Mavare
General Secretary
Mozambique - South Africa Longa Distancia Taxi Associacao
1139 Avenida Albert Ntuli,
Maputo
MOZAMBIQUE
Tel: 258 1 402 020
Fax: 258 1 430 674
Email:

J O Mkinga
Ports and Shipping Expert
Southern Africa Transport & Communications Commission (Technical Unit)
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 420214 / 258 1 420246
Fax: 258 1 420213 / 431288
Email: jmkinga@satcc.org

Mr Dick Moore
Commercial Director
Maputo Port Development Company
CP 2158
Direccao do Porto Maputo
MOZAMBIQUE
Tel: 258 1 492952
Fax: 258 1 497699
Email: mpdc@cfmnet.co.mz

Mr. Eric H Msolomba
Director
Southern African Transport and Communications Commission
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 420 214 / 258 1 429 177 /
Fax: 258 1 420 213
Email: director@satcc.org

Mr Jose R Nhancale
Vice Chairman
Mozambique - South Africa Longa Distancia Taxi Associacao
1139 Avenida Albert Ntuli,
Maputo
MOZAMBIQUE
Tel: 258 1 402 020
Fax: 258 1 402020
Email:

Mr. Notiso
Executive Director
Camara de Comercio de Mocambique
MOZAMBIQUE
Tel: 258 1 492 210
Fax: 258 1 49 0428
Email:

Ms. Olga Nunguambe
Deputy National Director of Commerce
Ministry of Industry and Commerce
C.P. 1831, Maputo
MOZAMBIQUE
Tel: 258 1 426 093/7
Fax:
Email:

Dr Antonio Pinto
Deputy National Director
Ministry of Transport & Communication, Mozambique
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 420 497/ 258 1 431 057
Fax: 258 1 431 028
Email: apinto@teledata.mz

Mr Manuel Ruas
Coordinator
Beira Development Corridor
MOZAMBIQUE
Tel:
Fax:
Email:

Mr. Sakhe K Silo
Principal Policy Officer
Southern African Transport and Communications Commission
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 420 214 / 258 1 429 177 /
Fax: 258 1 420 213
Email:

Ms Francisca Soares
Director
Ministry of Transport & Communication, Mozambique
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 424355
Fax: 258 1 430151
Email: francis@zebra.uem.mz

Mr. Nicolau Sululo
Ministerial Advisor
Ministry of Industry and Commerce
C.P. 1831, Maputo
MOZAMBIQUE
Tel: 258 1 426 093/7
Fax:
Email:

Mr Paulo Tarmamade
Project Manager
Maputo Development Corridor
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 498312
Fax: 258 1 430151
Email: Tarmamade.mdc@teledata.mz

Mr. Rogério Zacarias
Provincial Director
Ministry of Transport & Communication, Mozambique
PO Box 4530, Maputo, Mozambique
MOZAMBIQUE
Tel: 722104/145
Fax: 258 1 304 832
Email:

Ms. Tracy Zinanga
Policy Analyst
Southern African Transport and Communications Commission
PO Box 2677, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 420 214 / 258 1 429 177 /
Fax: 258 1 420 213
Email: ttzinanga@satcc.org

Mr. Felisberto H Zualo
National Director
Secretaria de Estado da Aeronautica Civil, Direccao Nacional da Aviacao Civil
PO Box 227, Maputo, Mozambique
MOZAMBIQUE
Tel: 258 1 465416
Fax: 258 1 46 5415
Email: dnac.seac@teledata.mz

Mr. Jack Dempsey
Senior Manager Commercial Operat
TransNamib Holdings Ltd
Private Bag 13204, Windhoek, Namibia
NAMIBIA
Tel: 264 61 298 2169/2323
Fax: 264 61 298 2053
Email: jdempsey@transnamib.com.na

Ms Antoinette du Plooy
Manager-Cargo Services
Air Namibia
PO Box 731, Windhoek, Namibia
NAMIBIA
Tel: 264 61 299 6225
Fax: 264 61 299 6159
Email: aduplooy@airnamibia.co.na

Mr W J du Toit
Managing Director
FP du Toit Transport (Ptd) Ltd
PO Box 5673, Windhoek, Namibia
NAMIBIA
Tel: 264 61 26 3211
Fax: 264 61 26 1422
Email: trn@dutoit-transport.com.na

Mr. M N Dumeni
Customs Officer
Ministry of Finance, Namibia
Private Bag 13185, Windhoek, Namibia
NAMIBIA
Tel: 264 61 209 2811/25
Fax: 264 61 239 278
Email: kabozu@iafrica.com.na

Mr. Sam Geiseb
Executive Director
Namibia National Chamber of Commerce & Industry
PO Box 9358, Windhoek, Namibia
NAMIBIA
Tel: 264 61 228 809
Fax: 264 61 228 809
Email: nnccihg@mweb.com.na

Mr Frank Gschwender
Business Development Executive
Walvis Bay Corridor Group
PO Box 25220, Windhoek, Namibia
NAMIBIA
Tel: 264 61 25 1669
Fax: 264 61 25 1683
Email: wbcg@mweb.com.na

Ms. E Habner
First Secretary
South African High Commission
PO Box 23100, Windhoek, Namibia
NAMIBIA
Tel: 264 61 205 7111
Fax: 264 61 22 4140
Email:

Mr E Haihambo
Senior Manager-Operations
TransNamib Holdings Ltd
Private Bag 13204, Windhoek, Namibia
NAMIBIA
Tel: 264 61 298 2022
Fax: 264 61 298 2277
Email: ehaihambo@transnaib.co.na

Mr Hiveluah
Permanent Secretary
Ministry of Works, Transport & Communications, Namibia
Private Bag X13341 Windhoek
Namibia
NAMIBIA
Tel:
Fax:
Email:

Ms. Esther Kaapanda
Acting Deputy Director
Ministry of Works, Transport & Communications, Namibia
Private Bag X13341, Windhoek, Namibia
NAMIBIA
Tel: 264 61 811 279/320
Fax: 264 61 224 060
Email:

Mr Godfrey Kabozu
Director- Customs and Excise
Ministry of Finance, Namibia
Private Bag 13185, Windhoek, Namibia
NAMIBIA
Tel: 264 61 209 2811/25
Fax: 264 61 239 278
Email: kabozu@iafrica.com.na

Mr Lawrence Kiggundu
Divisional Engineer
Roads Authority, Namibia
Private Bag 12030, Ausspannplatz,
Windhoek, Namibia
NAMIBIA
Tel: 264 61 208 2043
Fax: 264 61 22 6920
Email: kiggundul@ra.org.na

Mr Norbert Liebich
Managing Director
Transworld Cargo (Pty) Ltd
PO Box 6746, Windhoek, Namibia
NAMIBIA
Tel: 264 61 22 8200
Fax: 264 61 22 7021
Email:
nliebich@wdh.transworldcargo.net

Mr Eric H Lowe
Director-Planning and Transport
Management
Ministry of Works, Transport &
Communication, Namibia
Private Bag 12005, Windhoek, Namibia
NAMIBIA
Tel: 264 61 208 8882
Fax: 264 61 225 756
Email: ehlowe@mwtc.gov.na

Ms A Mundia
Economist
Ministry of Works, Transport &
Communications, Namibia
Private Bag X13341, Windhoek,
Namibia
NAMIBIA
Tel:
Fax: 264 61 208 8890
Email: amundia@mwtc.gov.na

Mr Anthony Murithi
Chief Economist
Ministry of Works, Transport &
Communications, SSC Railways, Namibia
Private Bag X12005, Windhoek, Namibia
NAMIBIA
Tel: 264 61 2088207
Fax: 264 61 245721
Email: amurithi@mwtc.gov.na

Mr. Sheyavali
Customs Officer
Ministry of Finance, Namibia
Private Bag 13185, Windhoek, Namibia
NAMIBIA
Tel: 264 61 209 2811/25
Fax: 264 61 239 278
Email: kabozu@iafrica.com.na

Ms Angeline Simana
Economist
Ministry of Works, Transport &
Communications, Namibia
Private Bag X13341, Windhoek, Namibia
NAMIBIA
Tel:
Fax: 264 61 208 8890
Email:

Ms. SJH Coetzee
Managing Director
Consilium Legis
PO Box 40232, Arcadia, South Africa
SOUTH AFRICA
Tel: 2712 434 132
Fax: 27 12 434 216
Email: sc@consilium.co.za

Mr Peter J Copley
Transport Specialist
Development Bank of Southern Africa
PO Box 1234, Halfway House, South Africa, 1685
SOUTH AFRICA
Tel: 27 11 313 33361
Fax: 27 11 313 3086
Email: peterc@dbsa.org

Mr. Barney M Curtis
Executive Officer
Federation of East and Southern African Road Transport Assocations
PO Box 70202, Bryanston, South Africa, 2021
SOUTH AFRICA
Tel: 27 11 706 8519
Fax: 27 11 463 1192
Email: maddy@iafrica.com

Mr. Rod Eaton
Marketing Manager
Inchcape Shipping Services
PO Box 78465, Sandton, South Africa
SOUTH AFRICA
Tel: 27 11 285 0033
Fax: 27 11 886 1381
Email: rod.eaton@iss-shipping.com

Mr. Bo Giersing
Managing Director
Geirsing Rose
PO Box 2848, Fourway, 2055
SOUTH AFRICA
Tel: 27 11 465 3259
Fax: 27 11 465 3220
Email: giersa@iafrca.com

Mr. H Lemmer
Chief Executive
Road Freight Association
PO Box 7, Randburg, South Africa
SOUTH AFRICA
Tel: 27 11 789 1357
Fax: 27 11 789 1367
Email: technica2@rfa.co.za

Mr. Edward D Little
Executive Director
South African Association of Freight Forwarders
Private Bag X89, Bryanston, Johannesburg, South Africa
SOUTH AFRICA
Tel: 27 11 463 4131
Fax: 27 11 463 1367
Email: elittle@saaff.org.za

Mr. Paul Martin
Senior Manager
Spoornet
PO Box 31633, Braamfontein, 2017, South Africa
SOUTH AFRICA
Tel: 27 11 773 3505
Fax: 27 774 4124
Email: paulm@spoornet.co.za

Mr. Costa Perides
Technical Officer
Road Freight Association
PO Box 7, Randburg, South Africa
SOUTH AFRICA
Tel: 27 11 789 1357
Fax: 27 11 789 1367
Email: technica2@rfa.co.za

Mr. Baso Sanqo
Director Africa Desk
Department of Foreign Affairs, South Africa
SOUTH AFRICA
Tel: 27 12 351 0496
Fax: 27 12 351 0449
Email:

Mr. Nick Smith
Research Officer
Cross Border Road Transport Agency, South Africa
PO Box 13105, Hatfield, South Africa
SOUTH AFRICA
Tel: 27 12 362 1867
Fax: 27 12 362 3026
Email: nsmith@cbrta.co.za

Ms. Corrie Wilsenach
Facilitation Officer
Cross Border Road Transport Agency, South Africa
PO Box 13105, Hatfield, South Africa
SOUTH AFRICA
Tel: 27 12 362 1867
Fax: 27 12 362 3026
Email: cwilsenach@cbrta.co.za

Mr Fuad Abdalla
Principal Commercial Manager (Domestic)
Tanzania Railways Corporation
PO Box 468, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 0 51 110599X2292
Fax: 255 0 51 112529
Email:

Mr. Henry Bantu
Lecturer
National Institute of Transport
PO Box 705, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 744 277 458
Fax: 255 744 240 260
Email: henrybantu@yahoo.co.uk

Mr Justus R B Blazi
Senior Economist
Ministry of Communications & Transport, Tanzania
PO Box 9144, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2114425
Fax: 255 22 2112751
Email: blazi-justus@hotmail.com

Mr Fulgence R Bube
Manager
Super Star Forwarders Co Ltd
PO Box 16541, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2800
Fax: 255 22 2865 412/3
Email: stm@superdoll-tz.com

Mr Joachim E Chipa
Director of Research & Planning
Tanzania Central Freight Bureau
PO Box 3093, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2114174 / 2135081 / 2115579
Fax: 255 22 2116697
Email: tcfb@cats_net.com

Mr Felix F S Chuwa
Maritime Development Manager
(Maritime Economist)
Tanzania Central Freight Bureau
PO Box 3093, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 211 4174
Fax: 255 22 211 5579
Email: tcfb@cats_net.com

Mr Al-Karim Dawood
Executive Director
Transcargo Ltd
PO Box 40920, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2851001/2
Fax: 255 22 2851102
Email: transcargo@twiga.com

Mr Olav Ellevset
Chief Executive
Tanzania National Roads Agency
PO Box 11364, Dar Es Salaam, Tanzania
TANZANIA
Tel: 255 22 215 2576 / 0932 / 0485 / 2150101 (direct)
Fax: 255 22 215 0022
Email: transroadshq@cats-net.com

Mr Simon S Fourie
General Manager
Trans Africa Railway Corporation Tanzania Ltd
PO Box 836, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 222 152843
Fax: 255 222 152852
Email: Trans1@intafrica.com

Eng Saad S Y Fungafunga
Principal
National Institute of Transport, Tanzania
PO Box 705, Dar es Salaam, Tanzania
TANZANIA
Tel: 240 0148 / 0260 (dir)
Fax: 244 3149
Email: Fungafunga.saad@hotmal.com

Mr Said A Ibraham
Chairman
Tanzania Freight Forwarders Association
PO Box 7900, Dar es Salaam, Tanzania
TANZANIA
Tel:
Fax:
Email: marshajunior@hotmail.com

Mr. B A N Liamba
Assistant Director: Surface Transport
Ministry of Communications & Transport, Tanzania
PO Box 9144, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2114427 / 2137650-9X5065
Fax: 255 22 2122268 / 2112751
Email:

Mr Samson M E Luhigo
Director General
Tanzania Harbours Authority
PO Box 9184, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 211 0401 / 0371 / 6250 (dir)
Fax: 255 22 2130 390
Email: luhigo@raha.com

Mr. Willey Lyatuu
National Coordinator Road Management Initiative
Ministry of Works, Tanzania
PO Box 9423, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 213 7437
Fax: 255 22 212 8843
Email: rmitz@raha.com

Mr Humson S Makundi
Director: Policy & Planning
Ministry of Works, Tanzania
PO Box 9423, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 211 3924
Fax: 255 22 212 1465
Email: mag@mow.go.tz

Mr. Francis T Marmo
Director: Maintenance
Tanzania National Roads Agency
PO Box 11364, Dar es Salaam, Tanzania
TANZANIA
Tel: 022 2150932 / 2576
Fax: 022 2150022
Email: transroadshq@cats-net.com

Mr. Shami Mfikirwa
Deputy Commissioner Customs and Excise
Customs and Excise Tanzania
PO Box 9053
Dar es Salaam, Tanzania
TANZANIA
Tel: 255 744 789 964
Fax: 255 22 211 6640
Email:

Mr Iddi R Mkwata
Port Manager: Tanga
Tanzania Harbours Authority
PO Box 443, Tanga, Tanzania
TANZANIA
Tel: 255 27 264 3078
Fax:
Email:

Mr Jan Mors
Chief Executive Officer
Tanzania International Container Terminal Services Co
PO Box 13412, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 213 4056/7/8
Fax: 255 22 213 4019
Email:

Mr. C A Mwakasungula
Manager Research and Planning
Tanzania Central Freight Bureau
PO Box 3093, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2114174 / 5579 / 2135081
Fax: 255 22 2116697
Email: tcfb@cats_net.com

Mr. S R Mwakipesile
Senior Statistician: Macro Economic Division
President's Office: Planning Commission
PO Box 9242, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 211 2682
Fax:
Email:

Mr. Kirenga R Ndemino
Assistant Director: Air Transport
Ministry of Communications & Transport, Tanzania
PO Box 9144, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2114427
Fax:
Email: kirenga@hotmail.com

Mr. F K Nkulu
Manager: Operations
Trans Africa Railway Corporation Tanzania Ltd
PO Box 836, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 222 152722 / 150518
Fax: 255 222 152852 / 255 741 332595
Email: Trans1@intafrica.com

Mr Frank A Rashidi
Director: Shipping Services & Tariff Management
Tanzania Central Freight Bureau
PO Box 3093, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2114174 / 5579 / 2135081
Fax: 255 22 2116697
Email: tcfb@cats_net.com

Dr Bartholomew B Rufunjo
Director: Communications & Transport
Ministry of Communications & Transport, Tanzania
PO Box 9144, Dar Es Salaam, Tanzania
TANZANIA
Tel: 255 22 212 2268
Fax: 255 22 212 2268
Email: permsec@twiga.com

Mr. Ali Said
Chief Executive Officer
NAS Hauliers
PO Box 5622, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 744 325 552
Fax: 255 22 286 5672
Email: admin@nastz.com

Mr. S A Seif
Director
Superdoll Trailers Manufacure Co Ltd
PO Box 16541, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 2860930 / 3205
Fax: 255 22 2865412/3
Email: stm@superdoll-tz.com

Mr. Rogasian Shirima
Acting Senior Principal Collector
Customs and Excise Tanzania
PO Box 9053
Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 212 7783
Fax: 255 22 211 6640
Email: tlyimo@afsat.com

Mr. Abisai N Temba
Director: Policy & Planning
Ministry of Transport & Communication, Tanzania
PO Box 9423, Dar es Salaam, Tanzania
TANZANIA
Tel: 255 22 211 4425 / 6704
Fax: 255 22 211 2751 / 6032
Email: plandirector@hotmail.com

Mr Davison Thawethe
General Manager (Tanzania)
TAZAMA Pipelines
PO Box 2157, Dar es Salaam, Tanzania (regional office) / PO Box 71651, Ndola, Zambia (head office)
TANZANIA
Tel: 255 22 2117846 (dir)
Fax: 255 22 2119004
Email: thawethe@hotmail.com

Mr. Peter J Armond
Chief Executive
Zambia Association of Chambers of Commerce and Industry
PO Box 30844, Lusaka, Zambia
ZAMBIA
Tel: 260 1 253 020 / 252 369
Fax: 260 1 252 483 253 007
Email: zacci@zamnet.zm

Ms. Heather Chalcraft
Consultant to Southern African Development Community (SADC), Zambia & to Fedhaul Zambia, also editor of Lowdown
Fedhaul
PO Box 36666, Lusaka, Zambia
ZAMBIA
Tel: 260 1 701 397
Fax: 260 1 250 896
Email: lowdown@zamnet.zm

Mr. Abraham Chiwana
Senior Planner: Department of Planning & Information
Ministry of Commerce, Trade & Industry, Zambia
PO Box 31968, Lusaka, Zambia
ZAMBIA
Tel: 260 1 228 301-9
Fax: 260 1 226 984
Email: achiwana@yahoo.com

Dr. Munorweyi E Dhliwayo
Transport Programme Co-ordinator
United Nations Economic Commission for Africa
PO Box 30647, Lusaka, Zambia
ZAMBIA
Tel: 260 1 228 502/5
Fax: 260 1 236949
Email: Munorweyi_dhliwayo@yahoo.com

Mr. Berhane Giday
Senior Programme Analyst (Insurance)
Common Market for Eastern and Southern Africa Secretariat
PO Box 30051, Lusaka, Zambia
ZAMBIA
Tel: 260 1 229 725/32
Fax: 260 1 225 107
Email: bgiday@comesa.int

Ms. Chileshe M Kapwepwe
Managing Director
National Airports Corporation Ltd
Lusaka International Airport, PO Box 30175, Lusaka, Zambia
ZAMBIA
Tel: 260 1 271281
Fax: 260 1 224777
Email: naclmd@zamnet.zm

Mr. Alick B. Lungu
Senior Economist
Ministry of Commerce, Trade & Industry, Zambia
PO Box 31968, Lusaka, Zambia
ZAMBIA
Tel: 260 1 226 954 / 260 1 228 301/9
Fax: 260 1 226 727
Email: naclmd@zamnetzw

Mr. Gilbert Mbae Maeti
Senior Transport Economist
Common Market for Eastern and Southern Africa Secretariat
PO Box 30051, Lusaka, Zambia
ZAMBIA
Tel: 260 1 229 725/32
Fax: 260 1 225 107
Email: gmaeti@comesa.int

Ms. Caroline M. Makasa
Market Research Officer
Export Board of Zambia
PO Box 30064, Lusaka, Zambia
ZAMBIA
Tel: 260 1 228 106/7
Fax: 260 1 222 509
Email: Carolmk23@hotmail.com

Mr Erastus J O Mwencha
Secretary General
Common Market for Eastern and Southern Africa
PO Box 30051, Lusaka, Zambia
ZAMBIA
Tel: 260 1 229725/32 / 224977 (direct)
Fax: 260 1 227318
Email:

Mr. London Ngoma
Director: Planning & Research Unit
Ministry of Communications & Transport, Zambia
PO Box 50065, Ridgeway, Lusaka, Zambia
ZAMBIA
Tel: 260 1 251 444
Fax: 260 1 253 260
Email: minct@zamnet.zm

Mr Roland Norton
Chairman, also director of Inter-Link Carriers
Federation of Road Hauliers, Zambia
PO Box 31620, Lusaka, Zambia
ZAMBIA
Tel: 260 1 244 222/211
Fax: 260 1 244 188
Email: interlink@zamnet.zm

Dr Jerome Ntibarekerwa
Director: Infrastructure Development
Common Market for Eastern and Southern Africa
PO Box 30051, Lusaka, Zambia
ZAMBIA
Tel: 260 1 229725/32 / 295519 (dir)
Fax: 260 1 225107
Email: jntibarekerwa@comesa.int

Ms. Constance Nyadoi
Statistician
Common Market for Eastern and Southern Africa Secretariat
PO Box 30051, Lusaka, Zambia
ZAMBIA
Tel: 260 1 229 726
Fax: 260 1 225 107
Email: cnyandoi@comesa.int

Mr. R Nyundu
Chief Road Traffic Inspector
Ministry of Communications & Transport, Zambia
PO Box 50066, Ridgeway
ZAMBIA
Tel: 253113
Fax: 254194
Email: mict@zamnet.zm

Mr. Musapenda J Phiri
Consultant
Independent Management Consulting Services
PO Box 30997, Lusaka, Zambia
ZAMBIA
Tel: 260 227 889 / 260 1 226 606
Fax: 260 1 227 891
Email: imcs@zamnet.zm

Mr. Samuel Sandi
Senior Transport Economist (Planning & Research Unit)
Ministry of Communications & Transport, Zambia
PO Box 50065, Lusaka,
ZAMBIA
Tel: 260 1 254 063
Fax: 260 1 253 260
Email: samuelsandi@hotmail.com

Mr Kevin Shone
Manager Director
Kasembo Transport Limited
PO Box 71346, Ndola, Zambia
ZAMBIA
Tel: 260 02 650277/291/767 / 650 130 (direct)
Fax: 260 02 650130 / 651094
Email: kasembo@zamnet.zm

Ms. Mwase Tryness
Transport Economist
Ministry of Communications & Transport, Zambia
PO Box 50065, Lusaka, Zambia
ZAMBIA
Tel: 260 1 254 063 / 260 1 251 444
Fax: 260 1 253 260
Email:

Mr. Christopher Wakung'uma
Consultant
Independent Management Consulting Services
PO Box 30997, Lusaka, Zambia
ZAMBIA
Tel: 260 1 227 889
Fax: 260 1 227 890
Email:

Mr Adriaan Adams
Trade Representative
South African High Commission, Zimbabwe
PO Box A1654, Avondale, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 753147/52
Fax: 263 4 753185
Email: sahcecon@ecoweb.co.zw

Mr. SW Chimhamhiwa
Economist
National Railways of Zimbabwe
PO Box 596, Bulawayo, Zimbabwe
ZIMBABWE
Tel: 263 9 363 716
Fax: 263 9 363 850
Email:

Mr. Oliver Chirongoma
Deputy Coordinator
Ministry of Transport & Energy, Zimbabwe
PO Box CY 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 70 0693/9
Fax: 263 4 70 8225
Email:

Mr. E Choto
Market Researcher
National Railways of Zimbabwe
PO Box 596, Bulawayo, Zimbabwe
ZIMBABWE
Tel: 263 9 363 716
Fax: 263 9 363 850
Email:

Mr R Collet
Chairman
Colbro Transport
PO Box ST 620, Southerton, Harare
ZIMBABWE
Tel: 04 754404 6
Fax: 04 757295 / 620000
Email: rcollett@icon.co.zw

Mr David Cruttenden
Chief Executive (Unifreight) & Chairman of Chartered InstituteTransport
Unifreight Group
PO Box 772, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 621 000
Fax: 263 4 621 048
Email: utgceo@asfricaonline.co.zw

Mr Francis Dangare
Deputy Director: Roads
Ministry of Transport, Zimbabwe
Private Bag 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 11 801 262
Fax: 263 4 702 048
Email: dangaref@africaonline.co.zw

Ms. Irene Doka Michael
Deputy Chief Engineer
Ministry of Transport, Zimbabwe
Private Bag 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 11 801 262
Fax: 263 4 702 048
Email: imichael@africaonline.co.zw

Mr. Bernard Dzawanda
Planning Schemes Officer
National Railways of Zimbabwe
PO Box 596, Bulawayo, Zimbabwe
ZIMBABWE
Tel: 263 9 363 716
Fax: 263 9 363 850
Email: dzawandab@yahoo.com

Mr Sam Geza
Managing Director
Africonsult
PO Box CY 1547, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 790376 / 720864
Fax: 263 4 707240
Email: sgeza@pci.co.zw

Mr. Tony Greening
Regional Representative
Transport Research Laboratory, Zimbabwe
PO Box CY 38, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 726723
Fax: 263 4 726631
Email: tonyg@ecoweb.co.zw

Mr Conwell M Kantsande
Deputy Permanent Secretary
Ministry of Transport, Zimbabwe
PO Box CY 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 700 693/991
Fax: 263 4 737 358
Email:

Mr Nelson Kudenga
Director of Roads
Ministry of Transport, Zimbabwe
PO Box CY 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 726 726
Fax: 263 4 700 817
Email: nkudenga@africaonline.co.zw

Mr. W Kwedza
Assistant Director
Customs and Excise, Namibia
Private Bag 7715, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 70 3153
Fax: 263 4 79 0255
Email:

Mr Patty Leen
Chief Executive Officer
Transport Operators Association of Zimbabwe
PO Box HG 985, Highlands, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 746 536/7
Fax: 263 4 746 539
Email: toa@transasan.icon.co.zw

Mr. Ben Magaiza
Managing Director
Third Wave Consultancy
3 Power Close, Ashdown Park, Harare
ZIMBABWE
Tel: 263 91 325 826
Fax:
Email: leader@mweb.co.zw

Mr. Remigious Makumbe
General Secretary
Southern African Railways Association
67 Fifth Avenue, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 78 6068 / 263 1160 3802
Fax: 263 4 78 6074
Email:

Mr. L Masilela
Deputy Director
Zimbabwe Customs and Excise
Private Bag 7715, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 739598 / 263 4 251 782
Fax: 790255
Email:

Ms. J Mathema
Commissioner Road Motor Transportation
Ministry of Transport & Communication, Zimbabwe
PO Box CY 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4726 680
Fax:
Email: mathema@rmt.co.zw

Mr. F N Maziveyi
Assistant Director (Energy Administration)
Department of Energy Resources and Development: Ministry of Mines and Industry, Zimbabwe
Private Bag 7758, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 04 791760 9
Fax: 263 04 721967
Email: doezim@harare.iafrica.com

Mr Tatenda C Mbara
Lecturer - Transport Planning & Management
University of Zimbabwe - Department of Rural and Urban Planning
PO Box MP 167, MT Pleasant, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 303 211
Fax: 263 4 333407
Email: tmbara@sociol.ac.uz.zw

Mr A C Mpamhanga
Deputy Permanent Secretary
Ministry of Transport & Energy, Zimbabwe
PO Box CY 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 700 693/ 991
Fax: 263 4 737 358
Email:

Mr Shadrack Mudzinganyama
Chief Planner
Ministry of Transport & Communication, Zimbabwe
PO Box CY 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 726 680
Fax:
Email:

Mr. Lewis Mukwada
Chief Planning Manager
National Railways of Zimbabwe
PO Box 596, Bulawayo, Zimbabwe
ZIMBABWE
Tel: 263 9 363 716
Fax: 263 9 363 850
Email: lmukwada@nrz.co.zw

Mrs Rotina Musvaire
Trade Development Executive
Zimbabwe National Chamber of Commerce
PO Box 1934, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 753 451 / 263 4 753 444/9
Fax: 263 4 753450
Email: rotina@zncc.co.zw

Mr. C C Mutyambizi
Trade Development Executive
Zimbabwe National Chanber of Commerce
PO Box 1934, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 706 347
Fax: 263 4 706346
Email:

Mr Thomas Rambau
First Secretary (Political)
South African High Commission, Zimbabwe
PO Box A1654, Avondale, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 251 843/46
Fax: 263 4 757908
Email: sahcomm@harare.iafrica.com

Mr T L Shana
General Secretary
Zimbabwe Amalgamated Railwaymen's Union
PO Box 556, Bulawayo, Zimbabwe
ZIMBABWE
Tel: 263 9 66193 / 263 9 70041 / 263 9 60948/9
Fax: 263 09 71089
Email:

Mr G P Shoko
Assistant General Secretary
Zimbabwe Amalgamated Railwaymen's Union
PO Box 556, Bulawayo, Zimbabwe
ZIMBABWE
Tel: 263 9 70041 / 263 9 60948
Fax: 263(9)71089
Email:

Mr R Shumba
Assistant Director (Operations)
Zimbabwe Customs and Excise
Private Bag 7715, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 04 703153 9
Fax: 263 4 790255
Email:

Mr Charles PJ Sibanda
Acting Deputy Secretary – Traffic
Ministry of Transport & Energy, Zimbabwe
PO Box CY 595, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 703 897
Fax: 263 4 708 225
Email:

Mr Brian J Stock
Chairman: Infrastructure Committee
Confederation of Zimbabwe Industries
14 Tarliweton Rd, Harare, Zimbabwe
ZIMBABWE
Tel: 263 4 33 3053
Fax: 263 4 33 3053
Email: tiger@samara.co.zw

Mr D I Thornton
General Manager
Petrozim Line (Pvt) Ltd
PO Box CY 2179, Causeway, Harare, Zimbabwe
ZIMBABWE
Tel: 70548/9 / 794043
Fax: 734647
Email: petrozim@ecoweb.co.zw

APPENDIX E
ELECTRONIC SURVEY QUESTIONNAIRE FORMS

THE SOUTHERN AFRICAN TRANSPORT NETWORK: COMPARATIVE TRANSPORT COST ANALYSIS
RAILWAY STAKEHOLDER QUESTIONNAIRE

QUESTION 1

THE COUNTRY WHERE YOU ARE LOCATED

……..

RANKING OF FOLLOWING QUESTIONS (TICK OR CROSS CELL WHICH MEETS YOUR VIEW)

4	3	2	1
Strongly Agree	Agree	Disagree	Strongly Disagree

QUESTION 2 -

THE FOLLOWING ISSUES INFLUENCE TRANSPORT/RAILWAY COSTS

	ISSUE	NOTE	4	3	2	1
A	Inadequate support and enhancement of the implementation of transportation policy change programmes and recommendations (from the national and regional institutions)	1				
B	Inadequate railway inter networking arrangements	2				
C	Inappropriate railway interfacing with other modes that inhibits mode complimentarity and competition	2, 3				
D	Misplacement of heavy cargo to road hauliers due to railway limitations	4				
E	Lack of adequate cargo tracking systems in railways	-				
F	Slow restructuring and concessioning processes limiting private sector involvement in the industry	5				
G	Lack of cost reduction policies coupled with inefficient management systems	-				
H	Inappropriate tax systems that may enable the rail industry to subsidise roads	6				
I	Lack of effective regulatory institutions	7				
J	Lack of infrastructure maintenance culture that precipitates to poor operational performance	8				
K	Lack of environmental pollution control policies that can be effectively enforced for the benefit of other social services	-				
L	Lack of known performance indicators that can aid arbitration during conflicts	7				
M	Inappropriate business focus due to state dominance (or legacy) in the industry	-				
N	Overloading in competing modes	-				
O	Distances between Origin and Destination	-				
P	Lack of parity/flow in traffic (i.e., flow is one directional)	-				

QUESTION 3

THE FOLLOWING ARE CONSTRAINTS IN IMPLEMENTING COMESA/SADC INITIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	CONSTRAINT	4	3	2	1
A	Translation of model legislation and policies into national frameworks				
B	Insufficient resources (tech & fin)				
C	Insufficient involvement of all stakeholders				
D	Implementation capacity within governments				
E	Inadequate monitoring mechanisms				
F	Vested interests, sovereignty and nationalism				
G	Low level of awareness of regional activities				
H	Lack of stakeholder commitment				
I	Lack of business focus at government level				
J	Inadequate supporting structures and synchronization				
K	Ad hoc changes in government policy				
L	Institutional gaps				
M	Different stages of socio-economic development				
N	External influences				
O	Political instability				
P	Lack of advocacy				
Q	Insufficient working/viable examples				
R	Harmonization of legislation and policies				
S	Insufficient consultation/coordination at national and regional level				
T	Inadequate dissemination and application of research information				

QUESTION 4 -

THE FOLLOWING ACTION PLANS COULD BE USED TO ACCELERATE THE IMPLEMENTATION OF COMESA/SADC INITIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	ACTION PLAN	4	3	2	1
A	Public/private partnerships				
B	Cooperation/commitment from COMESA/SADC member states				
C	Information sharing/effective communication				
D	Establishment of monitoring mechanisms				
E	Drafting of transport policy/legislation				
F	Promoting the region as a viable and sustainable economic market				
G	Less Government (public) involvement in the transport sector				
h	Establishment/strengthening of transport forums e.g., RMFs				
I	Establishment of dedicated funding sources				
J	Training and education				
K	Pooling of resources/capital				

THE SOUTHERN AFRICAN TRANSPORT NETWORK:
MODALITIES FOR REDUCING TRANSPORT COST
CIVIL AVIATION STAKEHOLDER QUESTIONNAIRE

QUESTION 1

THE COUNTRY WHERE YOU ARE LOCATED
……..

RANKING OF FOLLOWING QUESTIONS (TICK OR CROSS CELL WHICH MEETS YOUR VIEW)

4	3	2	1
Strongly Agree	Agree	Disagree	Strongly Disagree

QUESTION 2 -
THE FOLLOWING ISSUES INFLUENCE TRANSPORT/AIR TRANSPORT COSTS

	ISSUE	NOTE	4	3	2	1
A	The cost (either through buy, lease or hire) of equipment and facilities of the aviation industry is too high and this precipitates into high airline costs that inhibit expansion of service	-				
B	Lack of a comprehensive report on the progress made so far in restructuring and privatisation of the region's airlines to gauge performance (and share achievements) to date	1				
C	The move towards greater liberalisation in the civil aviation industry and the repercussions of having open skies in the region	-				
D	Adhering to international safety standards/requirements and the impact that these and their associated new technologies may have on regional air safety and existing ground facilities.	-				
E	Current airline capacity utilization in the region	2, 3				
F	The need for dedicated air cargo services in the region to maximise economies of scale.	2, 3				
G	High domestic and regional air transport costs in comparison to those charged on international routes, e.g., Southern Africa to/from Europe	3				
H	Airline code sharing being engaged in by both big and small airlines in the region	-				
I	The regulative civil aviation environment	-				
J	Regional connectivity in the airline industry	4				
K	The need to remunerate key personnel (e.g., pilots, aviation mechanics) at international rates due to the high mobility/demand for such personnel.	5				

QUESTION 3

THE FOLLOWING ARE CONSTRAINTS IN IMPLEMENTING COMESA/SADC INITIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	CONSTRAINT	4	3	2	1
A	Translation of model legislation and policies into national frameworks				
B	Insufficient resources (tech & fin)				
C	Insufficient involvement of all stakeholders				
D	Implementation capacity within governments				
E	Inadequate monitoring mechanisms				
F	Vested interests, sovereignty and nationalism				
G	Low level of awareness of regional activities				
H	Lack of stakeholder commitment				
I	Lack of business focus at government level				
J	Inadequate supporting structures and synchronization				
K	Ad hoc changes in government policy				
L	Institutional gaps				
M	Different stages of socioeconomic development				
N	External influences				
O	Political instability				
P	Lack of advocacy				
Q	Insufficient working/viable examples				
R	Harmonization of legislation and policies				
S	Insufficient consultation/coordination at national and regional level				
T	Inadequate dissemination and application of research information				

QUESTION 4 -

THE FOLLOWING ACTION PLANS COULD BE USED TO ACCELERATE THE IMPLEMENTATION OF COMESA/SADC INITIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	ACTION PLAN	4	3	2	1
A	Public/private partnerships				
B	Cooperation/commitment from COMESA/SADC member states				
C	Information sharing/effective communication				
D	Establishment of monitoring mechanisms				
E	Drafting of transport policy/legislation				
F	Promoting region as a viable and sustainable economic market				
G	Less Government (public) involvement in the transport sector				
H	Establishment/strengthening of transport forums e.g., RMFs				
I	Establishment of dedicated funding sources				
J	Training and education				
K	Pooling of resources/capital				

THE SOUTHERN AFRICAN TRANSPORT NETWORK: COMPARATIVE TRANSPORT COST ANALYSIS
ROAD TRANSPORT STAKEHOLDER QUESTIONNAIRE

QUESTION 1

THE COUNTRY WHERE YOU ARE LOCATED

……..

RANKING OF FOLLOWING QUESTIONS (TICK OR CROSS CELL WHICH MEETS YOUR VIEW)

4	3	2	1
Strongly Agree	Agree	Disagree	Strongly Disagree

QUESTION 2 -

THE FOLLOWING ISSUES INFLUENCE TRANSPORT/ROAD TRANSPORT COSTS

	ISSUE	NOTE	4	3	2	1
A	Inadequate capacity for industry regulators and service providers to enforce required standards	1				
B	Inadequate legislation and enforcement to enhance road safety	2				
C	Lack of regionally established policy framework under which government and the private sector should delivery road infrastructure and related services	3				
D	Lack of resources to continually analyse policy issues for economic management in trade and transportation	4				
E	Lack of a database that should provide a flow chart to enable stakeholders to review the barriers and achievement as they tackle them	-				
F	Slow processes in the creation of autonomous road agencies and boards to management road funds and to ensure coordinated road development and maintenance	5				
G	Lack of PPP in road infrastructure development, ownership and operation	6				
H	Lack of publicly known road maintenance standards that would attract public support during times of need	-				
I	Lack of appropriate mechanisms to use national security forces for infrastructure development and maintenance	-				
J	Lack of or inappropriate policies to deal with domestic/internal distribution aspects that affect the final costs of products to the consumer (i.e., trunk and secondary road connectivity and operation modalities)	3				
K	The existence of institutionalized corruption in the industry that leads to excessive infrastructure development and maintenance costs	-				

	ISSUE	NOTE	4	3	2	1
L	Lack of well established regional associations that can lobby government across national borders	6				
M	The existence of cabbotage in industry leading to idle capacity	-				
N	Lack of independent forums where policy makers, practitioners, the inter-government organisations and business people discuss on equal footing	6				
O	Inadequate independent in-country forums that can monitor and lobby for policy change without disrupting economic activity	6, 7				
P	Border post issues (e.g., delays, documentation, procedures etc).	8				
Q	Cost of spare parts (especially if paid for in foreign currency)	9				
R	The industry being dominated by a few players	10				
S	Capacity limitations in the road transport infrastructure	11				
T	Physical road conditions	12				

QUESTION 3

THE FOLLOWING ARE CONSTRAINTS IN IMPLEMENTING COMESA/SADC INITIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	CONSTRAINT	4	3	2	1
A	Translation of model legislation and policies into national frameworks				
B	Insufficient resources (tech & fin)				
C	Insufficient involvement of all stakeholders				
D	Implementation capacity within governments				
E	Inadequate monitoring mechanisms				
F	Vested interests, sovereignty and nationalism				
G	Low level of awareness of regional activities				
H	Lack of stakeholder commitment				
I	Lack of business focus at government level				
J	Inadequate supporting structures and synchronization				
K	Ad hoc changes in government policy				
L	Institutional gaps				
M	Different stages of socioeconomic development				
N	External influences				
O	Political instability				
P	Lack of advocacy				
Q	Insufficient working/viable examples				
R	Harmonization of legislation and policies				
S	Insufficient consultation/coordination at national and regional level				
T	Inadequate dissemination and application of research information				

QUESTION 4 -
THE FOLLOWING ACTION PLANS COULD BE USED TO ACCELERATE THE IMPLEMENTATION OF COMESA/SADC INITIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	ACTION PLAN	4	3	2	1
A	Public/private partnerships				
B	Cooperation/commitment from COMESA/SADC member states				
C	Information sharing/effective communication				
D	Establishment of monitoring mechanisms				
E	Drafting of transport policy/legislation				
F	Promoting the region as a viable and sustainable economic market				
G	Less Government (public) involvement in the transport sector				
H	Establishment/strengthening of transport forums e.g., Regional Management Forums				
I	Establishment of dedicated funding sources				
J	Training and education				
K	Pooling of resources/capital				

THE SOUTHERN AFRICAN TRANSPORT NETWORK: COMPARATIVE TRANSPORT COST ANALYSIS
PIPELINE STAKEHOLDER QUESTIONNAIRE

QUESTION 1

THE COUNTRY WHERE YOU ARE LOCATED
……..
RANKING OF FOLLOWING QUESTIONS (TICK OR CROSS CELL WHICH MEETS YOUR VIEW)

4	3	2	1
Strongly Agree	Agree	Disagree	Strongly Disagree

QUESTION 2 -
THE FOLLOWING ISSUES INFLUENCE TRANSPORT/PIPELINE COSTS

	ISSUE/RANK	NOTE	4	3	2	1
A	The state of ownership that affects the service costing for commodities delivered	1				
B	Safety requirements and procedures	2				
C	Current cost structures (as it is assumed that the carrying of liquids by road or rail may be more expensive, yet transporters still use these modes rather than pipeline).	3				
D	Oil distribution and the impact of middlemen influencing intermediary costs	-				
E	Interfacing of oil terminals to other modes	4				
F	The physical state of the pipeline infrastructure	-				

QUESTION 3
THE FOLLOWING ARE CONSTRAINTS IN IMPLEMENTING COMESA/SADC INTIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	CONSTRAINT/RANK	4	3	2	1
A	Translation of model legislation and policies into national frameworks				
B	Insufficient resources (tech & fin)				
C	Insufficient involvement of all stakeholders				
D	Implementation capacity within governments				
E	Inadequate monitoring mechanisms				
F	Vested interests, sovereignty and nationalism				
G	Low level of awareness of regional activities				
H	Lack of stakeholder commitment				
I	Lack of business focus at government level				
J	Inadequate supporting structures and synchronization				

	CONSTRAINT/RANK	4	3	2	1
K	Ad hoc changes in government policy				
L	Institutional gaps				
M	Different stages of socioeconomic development				
N	External influences				

QUESTION 3(CNTD)
THE FOLLOWING ARE CONSTRAINTS IN IMPLEMENTING COMESA/SADC INTIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	CONSTRAINT/RANK	4	3	2	1
A	Political instability				
B	Lack of advocacy				
C	Insufficient working/viable examples				
D	Harmonization of legislation and policies				
E	Insufficient consultation/coordination at national and regional level				
F	Inadequate dissemination and application of research information				

QUESTION 4 -
THE FOLLOWING ACTION PLANS COULD BE USED TO ACCELERATE THE IMPLEMENTATION OF COMESA/SADC INTIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	ACTION PLAN	4	3	2	1
A	Public/private partnerships				
B	Cooperation/commitment from COMESA/SADC member states				
C	Information sharing/effective communication				
D	Establishment of monitoring mechanisms				
E	Drafting of transport policy/legislation				
F	Promoting the region as a viable and sustainable economic market				
G	Less Government (public) involvement in the transport sector				
H	Establishment/strengthening of transport forums e.g., Regional Management Forums				
I	Establishment of dedicated funding sources				
J	Training and education				
K	Pooling of resources/capital				

THE SOUTHERN AFRICAN TRANSPORT NETWORK: COMPARATIVE TRANSPORT COST ANALYSIS
MARINE/INLAND WATER/PORT STAKEHOLDER QUESTIONNAIRE

QUESTION 1

THE COUNTRY WHERE YOU ARE LOCATED
……..
RANKING OF FOLLOWING QUESTIONS (TICK OR CROSS CELL WHICH MEETS YOUR VIEW)

4	3	2	1
Strongly Agree	Agree	Disagree	Strongly Disagree

QUESTION 2 -
THE FOLLOWING ISSUES INFLUENCE TRANSPORT/MARINE/INLAND WATER AND PORT TRANSPORT COSTS

	ISSUE	NOTE	4	3	2	1
A	Low cargo availability in the region due to inability to consolidate available cargo	1				
B	There is low capacity building for shippers organizations	2				
C	Lack of proper forums to promote regional shipping lines in partnership with major international lines	3				
D	Low indigenous private sector participation in the industry	4				
E	Coastal services dominating traffic to ports due to hub and spoke principle coupled with the super large vessel development that has left many of the port wanting by way of infrastructure and facilities for such ships	-				
F	Inadequate shipping services and capacity in major lakes and rivers. This is further complicated by the poor interface between inland waterways and other modes of transport	4, 5, 6				
G	Shippers experience high costs of handling containers due to container overstay and high demurrage charges.	6				
H	Low port efficiency in most ports that do not match the just in time (JIT) principle of doing business	5, 7, 8				
I	Inadequate pollution control standards that engenders marine life and hence resource that can support trade	-				
J	Weak management practices and very slow concessioning/privatization implementation in ports	9				
K	Cross subsidies among different berths between general cargo berths and container terminals that is costly to efficient operations per berth	7, 10				
l	Poor port information base to clients and lack of data interface between port operators and customs, policy,	11				

	ISSUE	NOTE	4	3	2	1
	railways and road hauliers					
M	Long and delayed cargo clearing procedures	11, 12				
N	Lack of frequent and common consultative forums for port authorities, railways, road operators and pipeline owners	4				
O	Lack of marine transport operating and performance standards	13				
P	High level of port state controls that lead to bureaucratic approaches when dealing with port problems	12				
Q	Lack of adequate security and hence poor safety that leads to high insurance premiums.	-				

QUESTION 3
THE FOLLOWING ARE CONSTRAINTS IN IMPLEMENTING COMESA/SADC INITIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	CONSTRAINT	4	3	2	1
A	Translation of model legislation and policies into national frameworks				
B	Insufficient resources (tech & fin)				
C	Insufficient involvement of all stakeholders				
D	Implementation capacity within governments				
E	Inadequate monitoring mechanisms				
F	Vested interests, sovereignty and nationalism				
G	Low level of awareness of regional activities				
H	Lack of stakeholder commitment				
I	Lack of business focus at government level				
J	Inadequate supporting structures and synchronization				
K	Ad hoc changes in government policy				
L	Institutional gaps				
M	Different stages of socioeconomic development				
N	External influences				
O	Political instability				
P	Lack of advocacy				
Q	Insufficient working/viable examples				
R	Harmonization of legislation and policies				
S	Insufficient consultation/coordination at national and regional level				
T	Inadequate dissemination and application of research information				

QUESTION 4 -
THE FOLLOWING ACTION PLANS COULD BE USED TO ACCELERATE THE

IMPLEMENTATION OF COMESA/SADC INIATIVES TO IMPROVE THE TRANSPORT SYSTEM IN THE SOUTHERN AFRICAN REGION (FOCUS ON YOUR PARTICULAR MODE/INDUSTRY)

	ACTION PLAN	4	3	2	1
A	Public/private partnerships				
B	Cooperation/commitment from COMESA/SADC member states				
C	Information sharing/effective communication				
D	Establishment of monitoring mechanisms				
E	Drafting of transport policy/legislation				
F	Promoting the region as a viable and sustainable economic market				
G	Less Government (public) involvement in the transport sector				
H	Establishment/strengthening of transport forums e.g., Regional Management Forums				
I	Establishment of dedicated funding sources				
J	Training and education				
K	Pooling of resources/capital				

APPENDIX F
STATISTICAL ANALYSIS

Significance tests of the mean

As discussed above, ANOVA was conducted for all modal responses of the electronic questionnaire. ANOVA tests were conducted using both the Bonferroni t-tests of differences between means and the Gabriel's multiple-comparison test procedure in order to test whether those perceived variables with higher means were in fact significantly higher than the means of other perceived variables. Both tests gave the same results and a summary of results are given below. Where results show no significant difference between mean scores of two issues/constraints/actions, it does not necessarily mean that no difference exists but that the difference, if any, is not large enough to be detected with the given sample size. Significance tests are based on an alpha level of 0.05.

Rail Transport: Analysis of Variance for Question 2 (see Table B.2)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate,
but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	96
Error Mean Square	0.821429
Critical Value of Studentized Maximum Modulus	3.64034
Minimum Significant Difference	1.7636

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	issue
A	3.5714	7	Q_2n
A	3.5714	7	Q_2p
A	3.4286	7	Q_2o
A	3.4286	7	Q_2h
A	3.2857	7	Q_2b
A	3.1429	7	Q_2a
A	3.1429	7	Q_2g
A	3.0000	7	Q_2m
A	2.8571	7	Q_2i
A	2.8571	7	Q_2j
A	2.8571	7	Q_2c
A	2.7143	7	Q_2k
A	2.5714	7	Q_2d
A	2.4286	7	Q_2f
A	2.4286	7	Q_2e
A	2.4286	7	Q_2l

Air Transport: Analysis of Variance for Question 2 (see Table B.4)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate,
but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	44
Error Mean Square	0.454545
Critical Value of Studentized Maximum Modulus	3.52844
Minimum Significant Difference	1.5045

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	issue
A	3.6000	5	Q_2g
A	3.4000	5	Q_2a
A	3.2000	5	Q_2j
A	3.2000	5	Q_2k
A	3.0000	5	Q_2d
A	3.0000	5	Q_2f
A	3.0000	5	Q_2e
A	3.0000	5	Q_2b
A	3.0000	5	Q_2i
A	2.8000	5	Q_2h
A	2.6000	5	Q_2c

Marine Transport: Analysis of Variance for Question 2 (see Table B.3)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate,
but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	11
Error Mean Square	1.363636
Critical Value of Studentized Maximum Modulus	4.22380
Minimum Significant Difference	4.9323

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	issue
A	4.000	2	Q_2h
A	3.500	2	Q_2c
A	3.500	2	Q_2j
A	3.500	2	Q_2f
A	3.000	2	Q_2a
A	3.000	2	Q_2g
A	3.000	2	Q_2b
A	2.500	2	Q_2e
A	2.500	2	Q_2k
A	2.500	2	Q_2d
A	1.000	2	Q_2i

Pipeline Transport: Analysis of Variance for Question 2 (see Table B.5)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate,
but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	22
Error Mean Square	0.424242
Critical Value of Studentized Maximum Modulus	3.75341
Minimum Significant Difference	1.9961

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	issue
A	3.0000	3	Q_2a
A	3.0000	3	Q_2b
A	3.0000	3	Q_2c
A	3.0000	3	Q_2d
A	2.6667	3	Q_2e
A	2.3333	3	Q_2f

Road Transport: Analysis of Variance for Question 3 (see Table 4.1)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	399
Error Mean Square	0.538505
Critical Value of Studentized Maximum Modulus	3.64571
Minimum Significant Difference	0.8066

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	constraint
A	3.4545	22	Q_3d
A	3.3636	22	Q_3r
A	3.3182	22	Q_3a
A	3.2727	22	Q_3b
A	3.1818	22	Q_3s
A	3.1364	22	Q_3m
A	3.0909	22	Q_3c
A	3.0909	22	Q_3t
A	3.0455	22	Q_3e
A	3.0455	22	Q_3i
A	3.0000	22	Q_3h
A	3.0000	22	Q_3n
A	2.9091	22	Q_3j
A	2.8636	22	Q_3l
A	2.8636	22	Q_3p
A	2.8182	22	Q_3o
A	2.7273	22	Q_3g
A	2.7273	22	Q_3f
A	2.6818	22	Q_3k

Rail Transport: Analysis of Variance for Question 3 (see Table 4.5)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate,

but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	114
Error Mean Square	0.784461
Critical Value of Studentized Maximum Modulus	3.72191
Minimum Significant Difference	1.762

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	constraint
A	3.1429	7	Q_3r
A	3.1429	7	Q_3b
A	3.0000	7	Q_3o
A	3.0000	7	Q_3d
A	3.0000	7	Q_3m
A	3.0000	7	Q_3f
A	3.0000	7	Q_3i
A	3.0000	7	Q_3h
A	3.0000	7	Q_3l
A	2.8571	7	Q_3g
A	2.8571	7	Q_3e
A	2.8571	7	Q_3j
A	2.8571	7	Q_3a
A	2.7143	7	Q_3c
A	2.5714	7	Q_3n
A	2.5714	7	Q_3s
A	2.5714	7	Q_3k
A	2.1429	7	Q_3p
A	2.1429	7	Q_3t

Air Transport: Analysis of Variance for Question 3 (see Table 4.2)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate,
but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	57
Error Mean Square	0.482456
Critical Value of Studentized Maximum Modulus	3.82898
Minimum Significant Difference	1.8806

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	constraint
A	3.5000	4	Q_3m
A	3.5000	4	Q_3b
A	3.5000	4	Q_3d
A	3.5000	4	Q_3f
A	3.2500	4	Q_3c
A	3.2500	4	Q_3r
A	3.2500	4	Q_3l
A	3.2500	4	Q_3j
A	3.0000	4	Q_3g
A	3.0000	4	Q_3i
A	3.0000	4	Q_3t
A	3.0000	4	Q_3h
A	3.0000	4	Q_3e
A	3.0000	4	Q_3s
A	3.0000	4	Q_3a
A	3.0000	4	Q_3p
A	2.7500	4	Q_3o
A	2.7500	4	Q_3n
A	2.5000	4	Q_3k

Marine Transport: Analysis of Variance for Question 3 (see Table 4.3)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	19
Error Mean Square	0.578947
Critical Value of Studentized Maximum Modulus	4.25738
Minimum Significant Difference	3.2394

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	constraint
A	4.0000	2	Q_3r
A	3.5000	2	Q_3b

A	3.5000	2	Q_3e
A	3.5000	2	Q_3p
A	3.5000	2	Q_3i
A	3.5000	2	Q_3m
A	3.0000	2	Q_3n
A	3.0000	2	Q_3d
A	3.0000	2	Q_3k
A	3.0000	2	Q_3j
A	3.0000	2	Q_3g
A	3.0000	2	Q_3s
A	3.0000	2	Q_3a
A	2.5000	2	Q_3l
A	2.5000	2	Q_3c
A	2.5000	2	Q_3h
A	2.5000	2	Q_3o
A	2.5000	2	Q_3t
A	2.0000	2	Q_3f

Pipeline Transport: Analysis of Variance for Question 3 (see Table 4.4)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	38
Error Mean Square	0.701754
Critical Value of Studentized Maximum Modulus	3.93605
Minimum Significant Difference	2.6922

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	constraint
A	3.3333	3	Q_3e
A	3.3333	3	Q_3t
A	3.0000	3	Q_3b
A	3.0000	3	Q_3f
A	3.0000	3	Q_3a
A	3.0000	3	Q_3j
A	3.0000	3	Q_3g
A	3.0000	3	Q_3m
A	2.6667	3	Q_3d

A	2.6667	3	Q_3h
A	2.6667	3	Q_3k
A	2.6667	3	Q_3n
A	2.6667	3	Q_3i
A	2.6667	3	Q_3s
A	2.6667	3	Q_3c
A	2.6667	3	Q_3r
A	2.3333	3	Q_3l
A	2.3333	3	Q_3p
A	2.3333	3	Q_3o

Road Transport: Analysis of Variance for Question 4 (see Table 6.1)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	231
Error Mean Square	0.328611
Critical Value of Studentized Maximum Modulus	3.35116
Minimum Significant Difference	0.5792

Means with the same letter are not significantly different.

SMM Grouping			Mean	N	action
	A		3.5455	22	Q_4a
	A		3.5455	22	Q_4b
B	A		3.4545	22	Q_4j
B	A	C	3.4091	22	Q_4i
B	A	C	3.3182	22	Q_4d
B	A	C	3.2273	22	Q_4h
B	A	C	3.1364	22	Q_4c
B	A	C	3.1364	22	Q_4k
B		C	2.9091	22	Q_4f
		C	2.8636	22	Q_4e
	D		2.0000	22	Q_4g

Rail Transport: Analysis of Variance for Question 4 (see Table 6.5)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate,
but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	66
Error Mean Square	0.467532
Critical Value of Studentized Maximum Modulus	3.45484
Minimum Significant Difference	1.2627

Means with the same letter are not significantly different.

SMM Grouping		Mean	N	action
	A	3.5714	7	Q_4b
	A	3.5714	7	Q_4d
	A	3.5714	7	Q_4f
	A	3.5714	7	Q_4h
	A	3.4286	7	Q_4c
	A	3.1429	7	Q_4a
	A	3.1429	7	Q_4e
	A	3.1429	7	Q_4j
B	A	3.0000	7	Q_4i
B	A	2.8571	7	Q_4k
B		1.8571	7	Q_4g

Air Transport: Analysis of Variance for Question 4 (see Table 6.2)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate,
but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	33
Error Mean Square	0.356061
Critical Value of Studentized Maximum Modulus	3.60276
Minimum Significant Difference	1.5201

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	action
A	3.5000	4	Q_4a
A	3.5000	4	Q_4b
A	3.5000	4	Q_4k
A	3.5000	4	Q_4f
A	3.5000	4	Q_4e
A	3.5000	4	Q_4j
A	3.2500	4	Q_4c
A	3.2500	4	Q_4d
A	3.2500	4	Q_4i
A	2.7500	4	Q_4h
A	2.2500	4	Q_4g

Marine Transport: Analysis of Variance for Question 4 (see Table 6.3)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	11
Error Mean Square	0.181818
Critical Value of Studentized Maximum Modulus	4.22380
Minimum Significant Difference	1.801

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	action
A	4.0000	2	Q_4a
A	4.0000	2	Q_4d
B A	3.5000	2	Q_4c
B A	3.5000	2	Q_4b
B A	3.5000	2	Q_4i
B A	3.5000	2	Q_4j
B A	3.0000	2	Q_4k
B A	3.0000	2	Q_4h
B A	3.0000	2	Q_4e
B A	3.0000	2	Q_4f
B	2.0000	2	Q_4g

Pipeline Transport: Analysis of Variance for Question 4 (see Table 6.4)

The ANOVA Procedure

Studentized Maximum Modulus (GT2) Test for score

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ

Alpha	0.05
Error Degrees of Freedom	22
Error Mean Square	0.545455
Critical Value of Studentized Maximum Modulus	3.75341
Minimum Significant Difference	2.2634

Means with the same letter are not significantly different.

SMM Grouping	Mean	N	action
A	3.6667	3	Q_4a
A	3.6667	3	Q_4d
A	3.6667	3	Q_4c
A	3.6667	3	Q_4h
A	3.6667	3	Q_4k
A	3.3333	3	Q_4j
A	3.3333	3	Q_4i
A	3.3333	3	Q_4f
A	3.0000	3	Q_4e
A	3.0000	3	Q_4b
A	2.6667	3	Q_4g

APPENDIX G
SCOPE OF WORK

INTRODUCTION

United States Agency for International Development's Regional Economic Development Services Office for Eastern and Southern Africa (USAID/REDSO/ESA) and Africa Bureau's Productive Sector Growth and Environment Division in the Office of Sustainable Development (AFR/SD/PSGE), has been supporting a Regional Trade Analytical Agenda (RTAA). The Agenda focuses on evolving trade, transport and agricultural policies on regional integration, agricultural production, productivity and food security in Eastern and Southern Africa. Since 1995, the RTAA has undertaken several research and dissemination activities aimed at developing regional policies that support the development of regional and international trade, agricultural production and food security in Eastern and Southern Africa (ESA). RTAA works with regional institutions like the Common Market for Eastern and Southern Africa (COMESA), Southern Africa Development Community (SADC) that includes the Southern Africa Transport and Communications Commission (SATCC), the East African Community (EAC), Intergovernmental Authority on Development (IGAD), and the Transit Transport Coordination Authority (TTCA). RTAA also involves relevant government policy makers and other stakeholders in its research and dissemination.

In 1998, COMESA requested REDSO for support to undertake and disseminate the results of a study on Southern Africa Transport Network. The study is to cover Botswana, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe. To ensure that the study does not duplicate already available information, TechnoServe undertook a mission to the Southern Africa sub-region in June 2000. During the mission, consultations were made with COMESA, Southern Africa Development Community's (SADC's) Southern Africa Transport and Communications Commission (SATCC) and the Economic Commission for Africa's Sub-regional Development Centre for Southern Africa (ECA/SRDC/SA), government ministries responsible for transport in five of the seven countries. COMESA, SATCC and other RTAA partners stressed the need for a well-focused study on transportation in the region due to the changing stature of economic and political climate. This is not withstanding the findings of other earlier studies that have been conducted in the region and whose findings are being implemented by SADC member states.

To aid COMESA, SADC/SATCC and other economic blocks in the region to address transport costs and transit facilitation issues once the FTAs are declared USAID, through its Regional Development Services Office (REDSO), is sponsoring an investigative study to map out transport operational modalities in the new markets. The study will analyse transit transport costs through various corridors in the region and make recommendations on how to cut/reduce transport costs. Associates for Rural Development (ARD) have been contracted by USAID/REDSO to facilitate the execution of this study in liaison with TechnoServe Incorporated. It is intended that the study will complement past trade and transportation analysis already done in the region by various organisations.

THE PROBLEM

As COMESA gears for a Free Trade Area (FTA), many trade and transport stakeholders in the East and Southern Africa area are awaiting the declaration with anxiety. According to the

COMESA program, a FTA will be declared by October 2000 while SADC is programmed to make such a proclamation in September 2000. The COMESA approach will be immediate for all goods originating from within its member states while SADC has a phased program to be implemented over a period of eight years. Some SADC member countries are not COMESA members and vice versa. As a result, there are questions of efficiency and competitiveness that are being raised on trade and transportation in the evolving markets in the two sub-regions. At the same time, major transporters and investors want to know the impact that the above declarations will have on the prevailing high transport costs in the region.

The adverse impact of transport costs to trade efficiency is real if we consider what is spent on freight and related insurance as a percentage of cost insurance and freight import values for some countries in the region. In Africa, 11.5% of the total value of imports relates to transport costs that are incurred as freight and insurance charges. In North America, this percentage is 6.7% while in Asia it is 7.2%. The proportion of freight and insurance as a percentage of the c.i.f. value of imports is 23.6% in Eastern Africa while in Southern Africa it stands at 12.7%[1]. In Latin America, the ratio is 19.2%.

On the export side, many of the countries in Southern Africa spend 20% of their earnings on transportation and related insurance expenses. For example, Malawi spends 55.5% of her export earnings in meeting transport costs, while Lesotho spends 19.7% of her export earnings on the same. Zambia and Zimbabwe spend 17.1% and 16.2% of their export earnings to meet transport costs respectively. Therefore, transport cost and efficiency is a major issue that should be addressed and improvements made if the countries in the region are to gain substantially from international trade.

A lot of work has been done in the southern Africa region that is aimed at promoting regional integration. Despite realising some achievements, challenges still exist that inhibit free flow of transit traffic and hence adversely affecting agricultural production, food security and trade in general. In the study, challenges in each mode of transport will be dealt with in the objectives of the study. The study will basically analyse the current transport costs and show how the free trade markets in COMESA and SADC regions will influence them. The study will not duplicate information that has already been generated through other programs and will zero in on transport cost analysis in road/rail/marine/inland water/pipeline and air transport modes.

Objective of the study

The study will achieve three objectives in the seven countries that are covered. These are:

1 ***Analyse comparative transit costs along different corridors by road/rail/sea/ inland water/pipeline and aviation.*** The major corridors to be covered include, but are not limited to, the following transit routes:

[1] The statistics quoted are based on studies done by UNCTAD Secretariat in their report UNCTAD/LDC/104 of June 1999.

a) Maputo Corridor

i Maputo – Big Bend – Lavumisa
ii Maputo – RSA Border – Johannesburg
iii Maputo – Chicualacuala – Border with Zimbabwe – Harare
iv Maputo – Inhambane – Beira – Quelimane – Nacala (commonly known as the Trans-Mozambique Coastal Link)

b) Beira Corridor

i Beira – Mutare – Harare – Lusaka – Lubumbashi
ii Beira – Chimoio – Tete – Blantyre
iii Beira – Nhamilabue – Nsanje – Blantrye
iv Beira – Mutare – Harare – Lusaka – Mpulungu – Bujumbura

c) Nacala Corridor

i Nacala – Nampula – Mandimba – Mangochi – Lilongwe – Lusaka
ii Nacala – Namalo – Mawara

d) Tete Corridor

i Harare – Nyamapanda – Tete – Blantrye – Lilongwe
ii Tete – Cassacatza – Katete – Lusaka

e) Durban Corridor

i Durban – Johannesburg – Beit Bridge – Harare – Lusaka – Zaire Border
ii Lusaka – Border with Zaire (several exits)

f) Dare es Salaam Corridor

i Dar es Salaam – Mbeya – Tunduma – Nakonde – Lusaka - Harare
ii Dar es Salaam – Mbeya – Karonga – Lilongwe – Blantyre

g) Mpulungu Corridor

i Lusaka – Kasama – Mbala – Mpulungu – Bujumbura – Kigali
ii Lilongwe – Karonga – Nakonde – Mbala – Mpulungu – Bujumbura

h) Walvis Bay Corridor

i Walvis Bay – Windhoek – Gobabis – Maun (Botswana) – Francistown – Bulawayo – Harare
ii Walvis Bay – Grootfontein – Katima Mulilo – Livingstone – Lusaka – Mpulungu – Bujumbura
iii Walvis Bay – Windhoek – Noordoewer (RSA border)

2 ***Critically analyse the causes of slow implementation of the various recommendations that are contained in research and workshop reports that can lower transit costs if executed.*** In this analysis, the consultant will appreciate the fact that previous work done in the region has identified current challenges in each of the transport sub-sectors as contained herein below.

i Railway transport

The consultant will analyse how the following constraints affect transport costs:

- Inadequate support and enhancement of implementation of transportation policy change programmes and recommendations from the national and regional institutions
- Inadequate railway inter networking arrangements
- Inadequate railway inter-connectivity
- Misplacement of heavy cargo to road hauliers due to railway inefficiency
- Lack of adequate cargo tracking systems in railways
- Slow restructuring and concessioning process that has locked out private sector investors for too long
- Lack of cost reduction policies coupled with inefficient management systems
- Inappropriate railway/road/lake/pipeline interfacing that inhibits mode complimentarity and competition
- Inappropriate tax system that makes railways to subsidise roads through biased tariffs
- Lack of effective regulatory institutions for the transport industry
- Lack of infrastructure maintenance culture that precipitates to poor operational performance
- Lack of environmental pollution control policies that can be effectively enforced for the benefit of other social services
- Lack of known performance indicators that can aid arbitration during conflicts
- Inappropriate business focus due to state dominance in the industry

ii Roads and Road Transport

In this sub-sector, the analysis will focus but not be limited to the following deficiencies:

- Inadequate capacity for industry regulators and service providers to enforce required standards
- Inadequate legislation and enforcement to enhance road safety
- Lack of regionally established policy framework under which governments and the private sector should deliver road infrastructure and related services
- Lack of resources to continually analyse policy issues for economic management in trade and transportation
- Lack of a data base that should provide a flow chart to enable stakeholders to review the barriers and achievements as they tackle them
- Slow process in the creation of autonomous road agencies and boards to manage road funds and to ensure co-ordinated road development and maintenance
- Low private sector participation in road infrastructure development, ownership and operation
- Lack of publicly known road maintenance standards that would attract public support during times of need
- Lack of appropriate mechanisms to use national security forces for infrastructure development and maintenance during the forces down times

- Lack of or inappropriate policies to deal with domestic/internal distribution aspects that affect the final cost of products to the consumer (i.e., trunk and secondary road connectivity and operation modalities)
- The existence of institutionalised corruption in high offices that leads to excessive infrastructure development and maintenance costs
- Lack of well established regional associations that can lobby governments across national borders
- The existence of cabotage in the industry that leads to idle capacity
- Lack of independent forums where policy makers, practitioners, the inter-governmental organisations and business people discuss on equal footing
- In-existence of independent in-country forums that can monitor and lobby for policy change without disrupting economic activity

iii Marine and Inland Water

There has been few studies done in this sub-sector and the reports of those concluded so far are available from ECA. The studies cover Latin America and the Caribbean experiences but the findings could apply to the situation in the Southern Africa region. Overall, the consultant will analyse how the following contribute to transport cost escalations.

- Low cargo availability in the region due to inability to consolidate available cargo
- There is low capacity building for shippers' organisations
- Lack of proper forums to promote regional shipping lines in partnership with major international lines
- Low indigenous private sector participation in the industry
- Coastal services dominating traffic to ports due to hub port principal coupled with the super large vessel development that has left many of the ports wanting by way of infrastructure and facilities for such ships
- Inadequate shipping services and capacity in major lakes and rivers. This is further complicated by the poor interface between inland waterways and other modes of transport
- Shippers experience high costs of handling containers due to container overstay and high demurrage charges
- Low port efficiency in most ports that do not match the just in time (JIT) principal of doing business
- Inadequate pollution control standards that engenders marine life and hence resources that can support trade
- Weak management practices and very slow concessioning/privatisation implementation in ports
- Cross subsidies among different berths between general cargo berths and container terminals that is costly to efficient operations per berth
- Poor port information base to clients and lack of data interface between port operators and customs, policy, railways and road hauliers
- Long and delayed cargo clearing procedures
- Lack of frequent and common consultative forums for port authorities, railways, road operators and pipeline owners

- Lack of marine transport operating and performance standards
- High level of port state controls that lead to bureaucratic approaches when dealing with port problems
- Lack of adequate security and hence poor safety that leads to high insurance premiums

iv Aviation Issues

In this sub-sector, the consultant will analyse the impact of the following aspects among others.

- The taxation of equipment and facilities of the aviation industry is too high and this precipitates into high airline costs that inhibit expansion of service
- Lack of a comprehensive report on the progress made so far in restructuring and privatisation of the regions airlines to gauge performance to date
- An analysis of the liberalisation process and the repercussions of having open skies in the region
- The safety record and the impact the Communication Navigation Surveillance (CNS) for Air Traffic Management (ATM) will have in the regions air safety and what will happen to already installed ground facilities that are still under loan and useful
- Analyse current airline capacity utilisation to determine required levels of openness for the sector
- Quantify air cargo directional flows to determine the need for dedicated air cargo services in the region
- High domestic and regional air transport costs in comparison to international routes
- Analyse the impact of airline code sharing for small and big airlines and the marketing strategies of airline services
- Analyse the current regulation of the industry and propose areas requiring improvement

v Pipeline Transport

This mode of transport is not widely used because of its highly specialised nature in shifting white petroleum products. However, pipelines are in use in the following corridors:

Durban – Johannesburg
Beira – Harare
Dare-Es-Salaam – Ndola

The consultant will be expected to analyse cost structures of transporting liquid petroleum products by this mode *vis a vis* other modes in the region. In the process, the consultant should take into consideration the following aspects:

- The state of ownership that affects the service costing for commodities delivered
- Safety – especially against a background of pipeline punctures and fires
- Cost structure as carrying liquids by road and rail tankers is often more expensive yet transporters still use the latter two modes even where pipelines exist
- Oil distribution and the impact of middlemen in intermediary cost aspects

- Interfacing of oil terminals to other modes

3 ***Propose modalities of hastening implementation of the recommendations and hence lower transport costs in the region.***

THE SCOPE OF WORK

The consultant will conduct a comprehensive transport cost analysis of the regional transit systems in the evolving markets in COMESA and SADC economic blocks. In the analysis, the consultant will assess the region's implementation experience of approved recommendations that may reduce transport costs. He/she will evolve a way of facilitating quicker implementation of these recommendations so as to cut transport costs and enhance productivity and food security in the region. The consultant will be guided by the fact that transit costs are quite high. He/she will take into account that the last review of transit charges in southern Africa was done in 1994 and the current rates may be inconsistent and may require standardisation across the region to cover both COMESA and SADC regions. The issues of corruption en-route, insecurity, and operational delays that lead to increased transit costs should be analysed and the impact to transit costs quantified. It is expected that the consultant will apply perceptive variables and shadow prices in the course of the analysis. This aspect will be followed by analysing the fact that independent forums for transport and trade stakeholders, policy makers and regional economic communities (RECs) are rare and this impacts negatively on the strategies of cutting transport costs in the region. The impact of the SADC/SATCC encouragement of member states to establish road boards as well as route management groups on all major corridors as a way of bringing stakeholders together will also be analysed.

The consultant will determine the best method for COMESA and SADC/SATCC to assess the impact of transit transport costs on national economies and propose transport programs that will ease the determination of the levels of transport cost reductions that are achieved. This would make it possible to quantify progress and also determine obstacles with ease. This aspect will be tied closely with the possibility of all regional institutions covering the ESA region to evolve a periodic program of infrastructure audits along all the corridors. The analysis will cover national/regional budget reviews to rehabilitate key maritime/road/rail/lake/ aviation links and focus on the development and maintenance of regional transit transport corridors. While on this aspect, the consultant will determine how RTAA partners i.e., COMESA, SADC/SATCC, EAC, TTCA, IGAD and UNECA, can establish a way of information sharing. This forum may also advise on the use of various types of information so generated.

The consultant will be expected to recommend an approach that can facilitate development of a regional database on transport developments and promote understanding among RTAA partners. This will have to tie up with other studies on sector performance indicators. The indicators will establish common infrastructure standards and usage to allow for the enforcement of axle load limits and other operational standards throughout the region. Overall, the consultant will conduct a comprehensive literature review on studies that have been done in the past on regional transport sector issues. He/she will finally make

recommendations on the way forward in order to cut transport costs. The major contributors to transport costs will be prioritised for each sub-sector and the magnitudes of related cost components quantified. The cost of undertaking specific activities for transit cargo will be clearly documented and a sensitivity analysis performed on the key contributors to cost.

The consultant will consider the major areas of concern that relate to the operations of customs clearance at border posts, policing of transit traffic, and the regulatory framework that affects foreign vessels as they transit other countries. These include insurance, transit permit requirements, and issues of cabotage that inhibit the picking of onward cargo by foreign vessels. High taxes and duty on transport equipment that lead to increased transport costs.

In summary, the consultant will undertake the following activities:

a) Conduct a comparative transport cost analysis along the established corridors that serve Botswana, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe.
b) Review the recommendations/decisions taken by COMESA, SADC/SATCC and ECA that would lower transit costs that have not been implemented despite being sanctioned by the member countries.
c) Establish the reasons why such recommendations/decisions have not been implemented and/or why implementation has been slow.
d) Prioritise such recommendations/decisions taking into consideration the financial implications and other reasons that may have led to lack of implementation.
e) Determine what steps are necessary to achieve fast implementation in the short term, medium term and the long term. Show what it would cost to achieve fast implementation of the recommendations in the short term, medium term and the long term.
f) Analyse transport capacity availability and show how this can be enhanced if necessary.
g) Determine whether the transport sector in the region is competitive, oligopolistic or monopolistic for the key modes of transport.

Analysis of the above (a – g) requirements will form the core or basis to enable the consultant to analyse and provide qualitative and quantitative information on the following further requirements:

a) Analyse the role of the private sector associations in transport policy development and implementation and show how this can be enhanced to ensure strong lobbying of the policy institutions for positive transport policy change.
b) Identify the missing links in regional transport in southern Africa through specific transit points and quantify the economic gains that are foregone due to lack of such links.
c) Analyse traffic management aspects at the border posts, e.g., green, red and yellow.
d) Propose methods ensuring transit for fast, medium rated and slow traffic based on the origin of cargo and the accompanying certification.

e) Critically analyse the co-operation between COMESA and SADC/SATCC in the transport sector and come up with recommendations to enhance the same and recommend modalities of involving the political establishment in the transit transport co-operation between COMESA and SADC.
f) Document some key non-tariff barriers that cause transit delays and highlight how to deal with this problem, particularly during the SADC/FTA transition period.
g) Assess the impact of HIV/AIDS to transit transport costs in the region.
h) Analyse the reasons for poor utilisation of the railway network in the region.
i) Analyse transport cost variables for transit traffic from each of the member countries. These should include, but not limited to, aggregate transit cost for each landlocked country through alternative corridors; transit time by mode and corridor; transit security for both cargo and crew; develop perceptive variables to determine efficiency by mode and corridor so as to indicate the level of performance.
j) Review and document the privatisation and commercialisation process in the transport sector and show how this has affected transport costs.
k) Cabotage by governments; road user charges and the use of transit permits should also be analysed.
l) Make recommendations on follow-up activities that are required if transport costs are to be reduced in the region.
m) Draw clear key conclusions.

SATN Workshop

After the completion of the draft report the consultant, in consultation with ARD and TechnoServe, will organise and conduct a regional workshop to solicit feedback on the report and work out how to follow up on the recommendations of the study.

METHODOLOGY

The study has three objectives that require analytical work to be undertaken. The consultant will apply a three-stage approach. This will facilitate analysis of costs of handling cargo along different corridors and the examination of the various recommendations that are available in COMESA and SADC that would reduce transport costs if implemented. A method of determining why most of the recommendations are not implemented fast enough and drawing conclusions and recommendations on what should be done to cut transport costs is the final requirement.

While the approach to each of the requirements may vary, a quantitative approach coupled with statistical tests of significance to determine the key transport cost contributors analysis is recommended. Then sensitivity analysis on each of the major factors will be undertaken in order to determine which of the factors should be tackled first in future policy.

Using these guidelines, the consultant will develop a detailed methodology for purposes of bidding and execution of the study. In this research methodology proposal, the consultant will clearly indicate the potential institutions to be visited during data collection, method of data

analysis and the research teams that will be deployed for the job. It is expected that in the proposed methodology, the following considerations will be captured.

Document Review

The contractor shall review all the basic background documents to be provided by the RTAA partners prior to commencing fieldwork in the region. Further, the consultant shall also source, review and analyse other reports, policy documents and other reference materials relevant to undertaking the tasks described above.

Regional interviews and consultations

The consultant shall collect specific information primarily through interviews and other consultations with key stakeholders. A critical element of these consultations will be undertaken through subject specific focus group sessions with a small number of stakeholders directly affected by a particular transport issue.

QUALIFICATIONS OF THE CONSULTANT

The level of involvement in this study will favour the services of an established firm or a consortium of firms to execute. The firm will be expected to have undertaken a study of the same magnitude that has direct bearing to the current study in the Southern Africa region in the last five years. Proof of same will be required.

The lead consultant in the study will be a holder of an advanced degree in transport economics, economic policy analysis or planning with ten year's experience in international policy analysis in a research institution, university or government. The team will comprise of accomplished authors and researchers with several years in research and consultancy work in an established firm with a multidisciplinary set-up.

DURATION OF THE ASSIGNMENT

The assignment will be executed within five calendar months from the days a contract is signed between the consultant and the principal contractor ARD.

REPORTS

The consultant will provide monthly progress reports to TechnoServe and ARD-RAISE. All progress reports will be submitted electronically by email to all parties. The draft and final reports will also be submitted as electronic files in Word 97.

APPENDIX H
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