36005

THE WORLD BANK GROUP WASHINGTON, D.C.

TRANSPORT PAPERS TP-8 SEPTEMBER 2005

# Results of Railway Privatization in Africa

Richard Bullock.

TRANSPORT SECTOR BOARD

# RESULTS OF RAILWAY PRIVATIZATION IN AFRICA

Richard Bullock

THE WORLD BANK
Washington, D.C.

TRANSPORT
SECTOR
BOARD

1818 H Street NW
Washington, DC 20433
Telephone 202-473-1000
Internet www/worldbank.org
Published September 2005



This paper has been produced with the financial assistance of a grant from TRISP, a partnership between the UK Department for International Development and the World Bank, for learning and sharing of knowledge in the fields of transport and rural infrastructure services.

To order additional copies of this publication, please send an e-mail to the Transport Help Desk transport@worldbank.org

Transport publications are available on-line at http://www.worldbank.org/transport/

# TABLE OF CONTENTS

Preface ..... v
Author's Note ..... vii
Executive Summary ..... ix
1 Introduction ..... 1
2 Background ..... 1
2.1 Past Railway Development ..... 1
2.2 Railway Concessions Awarded Since 1993 ..... 3
2.3 The Main Concessionaires ..... 5
2.3.1 Bolloré ..... 5
2.3.2 Comazar ..... 5
2.3.3 NLPI ..... 5
2.3.4 RITES ..... 5
2.3.5 RDC ..... 6
2.3.6 CANAC ..... 6
3 The Concessions ..... 6
3.1 Introduction ..... 6
3.2 Ivory Coast/Burkina Faso (Sitarail) ..... 6
3.3 Cameroon ..... 10
3.4 Gabon ..... 11
3.5 Malawi ..... 14
3.6 DRC ..... 17
3.7 Beitbridge Railway ..... 17
3.8 Togo ..... 18
3.9 Ressano Garcia ..... 18
3.10 Senegal/Mali ..... 19
3.11 Madagascar ..... 21
3.12 Zambia ..... 22
3.13 Mozambique (Beira) ..... 24
3.14 Mozambique (Nacala) ..... 26
4 Impact Assessment ..... 27
4.1 Role of Rail ..... 27
4.2 Productive Efficiency. ..... 28
4.3 Allocative Efficiency ..... 30
4.4 Investment in Rail System ..... 32
4.5 Accessibility of the Rail System ..... 33
4.6 Affordability and Possible Impacts on the Poor. ..... 33
Annex 1: Development Of Railways In Sub-Saharan Africa ..... 35
Annex 2: Transit Traffic Through Mozambican Ports ..... 42
Glossary And Abbreviations ..... 45
Primary Data Sources ..... 47
Selected References ..... 53

# LIST OF FIGURES AND TABLES

Table 2-1. Concessions of African Railways Since 1993 ..... 3
Figure 2-1. Railway Concessions Awarded in Africa Since 1990. ..... 4
Table 3-1. Key Performance Indicators – Sitarail. ..... 9
Table 3-2. Key Performance Indicators – Camrail ..... 12
Table 3-3. Key Performance Indicators – CEAR Malawi. ..... 16
Table 3-4. Key Performance Indicators – Dakar-Bamako ..... 20
Table 3-5. Key Performance Indicators – Madarail. ..... 22
Table 3-6. Planned Investment for Beira Concession ($US million). ..... 24
Table 3-7. Current Operating Plan – Machipanda Line ..... 25
Figure 4-1. Labour Productivity Pre- And Post-Concessioning ..... 28
Table 4-1. Key Performance Indicators – Sitarail, Camrail and CEAR ..... 29
Table A2-1. Transit traffic through Maputo Port by Country (000 tonnes). ..... 42
Table A2-2. Transit Traffic through Beira Port by Country (000 tonnes) ..... 43
Table A2-3. Transit Traffic through Nacala (000 tonnes). ..... 44
Table A2-4. Malawi's Imports and Exports via SADC Ports, 2000-02 (000 tons) ..... 44

# PREFACE

In 2003, the World Bank's Transport and Urban Development Department initiated a review of international experience of railway privatization. Many of the Bank's countries of operation have adopted such policies over the last fifteen or so years, many with World Bank support or endorsement. The issue of whether to increase private participation in the railway sector remains a live policy issue in many other countries in which the Bank is active. It seemed wise to review the outcomes in countries where it has already been done.

An early report in this series was a review of British Railways privatization published in September 2004. At the same time, the Bank initiated three separate and independent reviews of experience in the three continents where private participation in railways has most substantially increased in recent years: Latin America, Australasia and Africa. This report describes the review of rail privatization in Africa.

The consultants selected for these reviews were asked to give greatest attention to the ***results*** of rail privatization. This was partly a matter of resources; over the three continents more than 60 individual railway concessions or sales were implemented. Each country and case has its own history, market characteristics, political context and administrative process: the intention of this work was to look beyond the details of each privatization process and focus on what they actually achieved. Taken over the whole range of experience, the merits or otherwise of private sector participation in railways as a broader policy principle might be discerned.

The terms of reference for the review in each continent were very similar. The authors were asked to consider impacts on the role of rail, productive (or technical) efficiency, allocative efficiency; investment in the rail system (including renewal of assets); accessibility of the rail system to passenger and freight users; and, in the case of Latin America and Africa, possible impacts on the poor. This was a tall order for the very modest budgets available, not least because rail privatization has, in many cases, led to a marked reduction in publicly available information about the railways involved. None of the reviews has been able to come to definitive conclusions on all criteria. But, taken in the round, the three reviews greatly improve our understanding of what may be expected to happen when a railway is privatized.

The authors were asked to take an independent view. The reports are published and disseminated as an input to continuing debate in an area of public policy that is of interest to many of the Bank's countries of operations. The authors' conclusions are their own and carry no specific or implied endorsement by the World Bank.

Paul Amos
Transport Adviser
Transport and Urban Development Department
World Bank

# AUTHOR'S NOTE

This report contains a number of data tables summarizing railway performance. These tables are only partially complete and reflect the data which was available as at mid-June 2005. It is intended they will be progressively completed as data becomes available in the coming period.

Following privatization and concessioning there is generally far less authoritative information available compared to the previous situation. This is due to a combination of factors: the replacement of detailed annual reports of public operators by summary reports of companies which are often very diversified; the limited reporting requirements in many concessions (which even then are often only partially complied with), and the emphasis by some concessionaires on commercial confidentiality.

As a result, information generally has to be gleaned from a variety of sources, some of which are less reliable than others. In order to provide a guide to the reliability of the information in this report, the following convention has been adopted:

- Where information is simply stated, it has been directly sourced from official reports or concessionaire data.
- Where information is qualified by "it is reported that," it has been sourced indirectly from third-party reports, the press or the internet.
- Where information is qualified by "it is understood that," it has been sourced from unattributable third parties.

The peer reviewers and World Bank staff, particularly Simon Thomas, Pierre Pozzo di Borgo, Antonio Estache, Jean Noel Guillossou and Bert Kruk, provided valuable contributions and comments concerning many of the transactions. The author would also like to thank both Bolloré and CEAR for providing detailed operational and financial information regarding their concessions. However, all responsibility for the material remains that of the author.

# EXECUTIVE SUMMARY

i. The changed role of rail in Africa over the last thirty years has seen it move from a situation where many of the systems were carrying a high share of their country's traffic to one in which their market share has declined, their assets have steadily deteriorated, their quality of service has reduced, and they are in many instances only a minor contributor to solving the transport problems of the continent.

ii. Most of the railways that have been presented for concessioning in Africa are badly run-down, requiring substantial rehabilitation of both infrastructure and rollingstock. They generally carry volumes that are very low by world standards, about what a self-respecting branch-line would carry in many countries. A few railways have substantial mineral traffic but most are carrying semi-bulk freight between the interior and the ports and vice versa; only in a few cases are there significant internal flows.

iii. Since 1993 there have been thirteen rail concessions in Africa, with another seven in progress. Two of these have been cancelled, one has been badly affected by war and one has suffered from natural disasters and procedural delays. Four have operated for five years or more but only one of these without a significant dislocation of some sort. Yet despite the vicissitudes, the results are encouraging. Throughput has generally increased. The railways are arguably performing better than if they had not been concessioned.

iv. The key findings of this review of results are:

- Productive efficiency has clearly improved. Labor productivity has increased steadily in all the concessions which have operated for over five years and similar figures are likely to come from most of the other recent concessions. Asset productivity has also generally increased.
- Allocative efficiency is difficult to measure directly but the evidence is generally positive. The improved railway productivity, the active searching for new traffic by concessionaires and the improvement in internal business practices have all improved railway cost structure and, perhaps more importantly, lifted the level of service, thus helping to attract traffic to the mode which can carry it most efficiently.
- In general, concessionaires have lived up to the passenger service requirements in their concession agreements, even where it has been operationally difficult for them to do so, or where promised Public Service Obligation (PSO) payments have not been forthcoming in practice. However, many of these services are a hangover from previous times and the passengers served would often be far better, and almost always more economically, served with a basic road–based system. Concessionaires faced with significant losses on such services are likely to be far more pro-active in pushing for the alternatives to be considered than a government-run rail system.
- Most African concessions have been associated with substantial investments, principally in infrastructure, by bilateral and multilateral lending agencies. Adoption of concessioning policies has been, in most cases, a pre-condition of sector lending. However, it is unclear whether, having been gifted or loaned (at concessional rates) such investment, many of these rail systems will be able to finance major future infrastructure renewals, either through concessionaire injections or from their internally generated returns. The evidence to date is that few, if any, of the concessions are generating significant profits for their operators and certainly not enough to fund long-term renewals. Although most concessions pay substantial concession fees into general government revenue, the likelihood is that none of them could really afford to if they were properly accruing funds for future renewals. It therefore remains an open question as to whether a purely privately financed rail concession model is achievable in much of Africa in the foreseeable future.

- Few of the concessions are now immune from road competition, except for a few cases where roads have still to be constructed or there are heavy mineral movements. The review yielded almost no examples of where concessioning has led to any services being reduced so that resources could be redeployed to favored users.
- Similarly there was no evidence that personal travel has been made more expensive for the poor, nor that freight rates have increased significantly.

v. In summary, the railways in Africa that have been concessioned are operating more efficiently and are more competitive. Investment has largely been funded by multilateral and bilateral loans at concessional rates (and often after substantial delays); there has been only been comparatively minor investment from other sources. Overall, concessioning in Africa has revitalized many systems but it is doubtful whether it can ensure their long-term survival without further injections of public investments.

# RESULTS OF RAIL CONCESSIONING IN AFRICA

## 1 INTRODUCTION

The World Bank is undertaking a review of railway concessions and privatizations in Latin America, Africa and Australasia.

This review is designed to assist the development community and policy makers in other countries who may be contemplating railway privatization. The report is principally concerned with the results of privatization rather than the processes or detailed concession structures, which have varied from country to country depending on diverse local circumstances.

This report is concerned with the results of the African concessions. As all concessions and privatizations to date have occurred in sub-Saharan Africa, the report confines itself to this part of the continent and does not discuss North Africa.

The report contains three main sections in addition to this introduction:

(i) A summary of the background to railway development in sub-Saharan Africa to the start of the 1990's, together with a list of the railway privatizations and concessions undertaken over the last 10 years and a brief description of the main concessionaires;

(ii) A more detailed presentation of the thirteen concessions, particularly the three which have been operating the longest (Sitarail in Ivory Coast/Burkina Faso, Camrail in Cameroon and CEAR in Malawi);

(iii) An assessment of the overall results of railway privatization/concessioning in terms of:

- Role of rail (traffic level, mode share etc);
- Productive efficiency;
- Allocative efficiency, including service quality appropriate to market;
- Investment in rail system (including renewal of assets);
- Accessibility of the rail system to passenger and freight users;
- Affordability, and possible direct and indirect impacts on the poor.

An annex gives a summary of the historical development of the various railways in Africa; in many cases this is an important factor in understanding the pattern of concessioning and the situation faced by some of the concessionaires.

## 2 BACKGROUND

### 2.1 Past Railway Development

The first railways south of the Sahara were built in South Africa in the 1860's and 1870's, with lines heading inland from the ports at Cape Town and Durban. The networks in what were then Cape Province, Natal and Transvaal continued to develop but it was not until the turn of the twentieth century that large-scale railway development began in other parts of the continent. Annex A summarizes the development for each of the sub-Saharan rail networks.

In almost every case, the pattern was the same, with isolated lines heading inland from a port to reach a trading centre or a mine, and a few branch lines then being built over a period of time. As almost all the lines were constructed under colonial administrations, many of the lines were State-owned but several were also constructed by concessions or, in the case of some mineral developments, by the mining company as an integral part of its mining operation.

This process has continued until recent times, with several lines having been built since the Second World War. As a result, most of the African networks remain disconnected lines, either within a single country or linking a port and its immediate regional hinterland, with the only international networks being those centered on Zimbabwe and Zambia and, to a lesser extent, the old East African Railways network in Kenya, Uganda and Tanzania.

This also reflects the limited amount of inter-country trade. While the countries were European colonies, there was little trade between, say, English and French colonies but, even today, trade volumes between adjacent countries are still often remarkably small. For example, between 1996 and 2000, less than 6 percent of Tanzania's trade by value was with Kenya, and about 2.5 percent with her other neighbors (Zambia, Rwanda, Burundi, DRC, Uganda and Malawi); even South Africa only represented 7 percent. The same pattern can be replicated in many other countries. It can be argued that this lack of regional trade is a product of the transport infrastructure inherited from colonial times but the similarity in the pattern of export products from many countries suggests that, even if such inter-regional links existed, it is likely they would be lightly-used.

This pattern of economic development has meant that African railways, more than almost anywhere else in the world, are closely linked to the ports (indeed, much of Africa had integrated port and railway organizations until recently) and, where railways traverse more than one country, freight traffic is generally almost all transit with comparatively little originating or terminating in the intermediate country[1].

Some of the railways were struggling financially from the start but they generally managed to operate reasonably successfully up to the 1960's. However, as the road system developed and larger trucks were introduced, the higher-value general freight was gradually captured and rail traffics increasingly comprised bulk mineral and agricultural traffic and semi-bulks such as fuel. Whilst this has in many cases provided enough funds to cover working expenses, railways have rarely been able (or allowed by government if they had the potential) to collect enough reserves to fund asset renewal; this has almost universally been provided on an intermittent basis through loans from multilateral or bilateral agencies, often leaving railways with poor infrastructure and a patchwork collection of disparate kinds of rollingstock. The steady degradation of the asset base has meant that even when, as in recent years, efforts have been made by railways to capture higher-value traffics such as containers, the quality of service has been so low that they have only achieved a limited market share wherever there is road competition.

Another problem for most African railways has been the continued requirement to operate passenger services without budgetary compensation. These have been required by governments but are generally covering only a part of their working expenses; this not only consumes cash that could be being used to renew the freight and infrastructure assets but also, for many railways, ties up traction power that could be being used for cash-generating freight services.

The final difficulty for many operators has been the impact of the many wars and civil disturbances that have occurred over the last fifty years. Railways are often one of the first targets for destruction and this has affected many railways, either directly (e.g. DRC, Angola, Mozambique, Ethiopia, Eritrea) or indirectly by cutting inland railways off from their ports (e.g. Malawi and Burkina Faso).

As a result, most of the railways that have been presented for concessioning in Africa have been (and generally still are) badly run-down, requiring substantial rehabilitation of both infrastructure and rollingstock. Even where they may have significant traffic volumes by local standards, these are generally low by world standards (a railway carrying more than 1 billion net tonne-km – about half the rail freight of Denmark - is a rarity in sub-Saharan Africa), and the concessions often come with requirements to continue operating a loss-making passenger service

Nevertheless, despite the unpromising circumstances, the rhetoric accompanying some of the transactions suggests that many of those supporting concessioning expected that the concession award would be the prelude to very substantial investments by the private concessionaires.

[1] A significant exception is Kenya; the railway was originally built to access Uganda but Kenya has since developed to such an extent it is now by far the larger traffic generator.

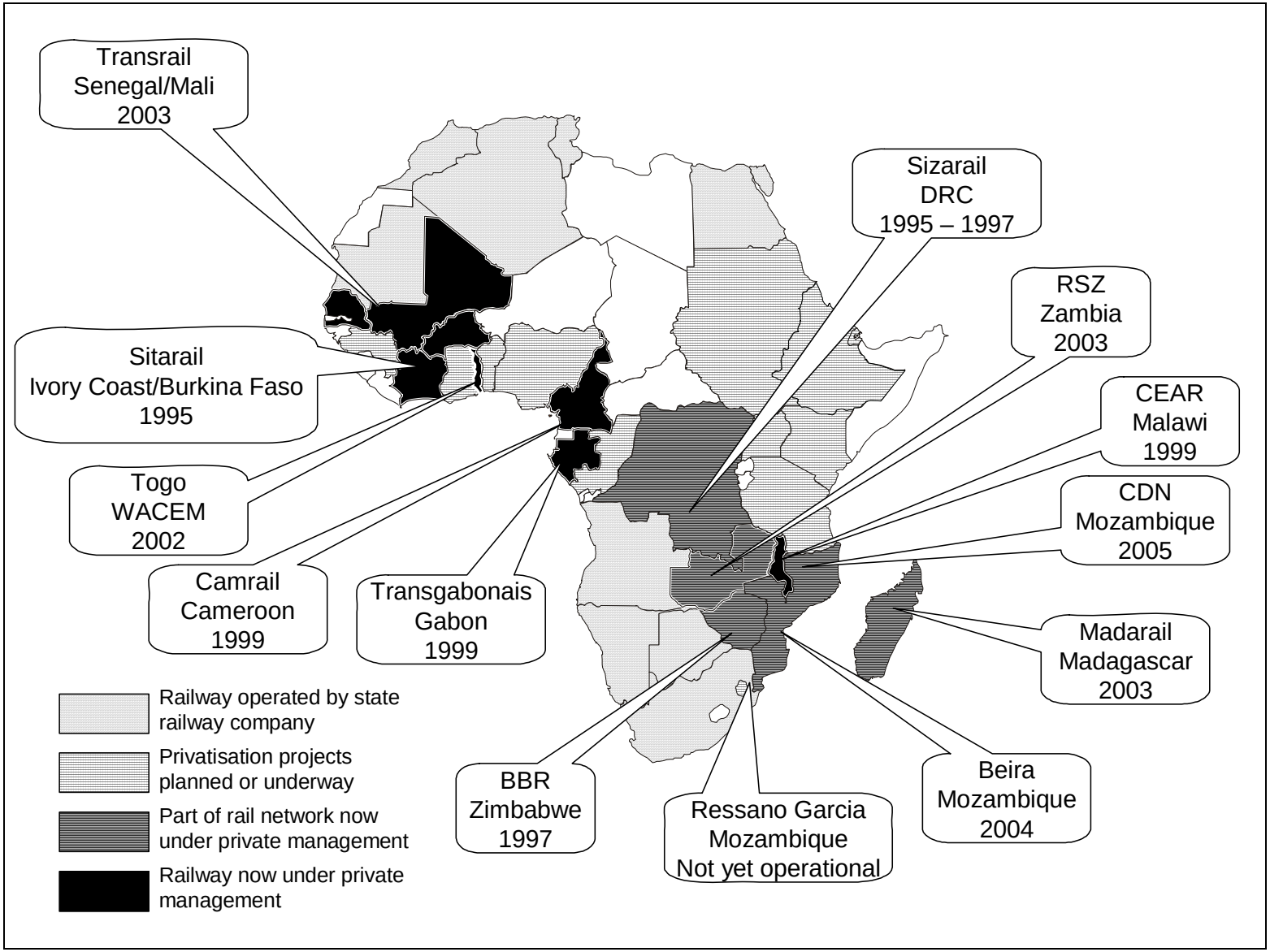
## 2.2 Railway Concessions Awarded Since 1993

Since 1993, thirteen concessions have been awarded in Africa, with a further seven in the process of being concessioned (Table 2-1).

**Table 2-1. Concessions of African Railways Since 1993.**

| Country | Year Awarded | Concessionaire | Year Commenced |
|---|---|---|---|
| Ivory Coast/Burkina Faso | 1995 | Sitarail | 1995 |
| Cameroon | 1998 | Camrail | 1999 |
| Gabon | 1999 | Transgabonais | 1999 |
| Malawi | 1999 | CEAR | 1999 |
| DRC | 1995 | Sizarail | 1995 |
| Zimbabwe | 1997 | BBR | 1997 |
| Togo | N.A. | WACEM | 2002 |
| Maputo Corridor | 2002 | NLPI/Spoornet | |
| Senegal/Mali | 2003 | Transrail | 2003 |
| Zambia | 2003 | RSZ | 2003 |
| Madagascar (north) | 2003 | Madarail | 2003 |
| Mozambique (Beira) | 2004 | Beira Rail | 2004 |
| Mozambique (Nacala) | 1999 | CDN | 2005 |
| | | | |
| **In Progress** | | | |
| Ghana | 2005 | United Rail | |
| Kenya | | | |
| Uganda | | | |
| Tanzania (TRC) | | | |
| Tanzania (Tazara) | | | |
| Ethiopia | | | |
| Congo Brazzaville | | | |

**Figure 2-1. Railway Concessions Awarded in Africa Since 1990.**



## 2.3 The Main Concessionaires

### *2.3.1 Bolloré*

Bolloré are a long-established large and diversified French-based group, with over 33,000 employees in 2003 and a turnover in that year of € 5.4 billion. They specialize in transport and logistics, which represents about two-thirds of their turnover, with most of the remainder being related to energy. In 2003, they operated in 119 countries, with about 30 percent of their turnover, and over 20,000 employees, related to Africa, particularly West Africa.

In Africa, it is active in shipping, through its Delmas, Otal and Setramar subsidiaries (it is reported it is currently in the process of selling these to CGM), ports (including Abidjan, where it was awarded the container terminal concession), forwarding, through SDV, Saga, Transami and NOTCO, in logistics and in commodity exports. It classifies its railway interests as one of its "activities connected with transport."

Bolloré are a long-established firm for whom railways are just one part of their overall business portfolio. They already operate, through their subsidiaries, the concessions in Ivory Coast and Cameroon (and previously in Madagascar) and have been, or are, bidders in many of the others.

### *2.3.2 Comazar*

Comazar is a private company registered in South Africa, involved in transport services and operations. It was originally established in 1995 to operate Sizarail in DRC, and at that time was 65 percent owned by Transnet, the state-owned South African transport holding company which controls Spoornet, with 21 percent held by Transurb, a railway consulting company partly owned by the Belgian Railways, and 14 percent by Artcole Investments, an Irish company involved in sourcing expatriate managers for African projects. It subsequently bid for Camrail and, during the government-orchestrated concessioning process, became part-owned by Bolloré; by 2000, Transurb had exited and the main shareholders were Transnet (32 percent), the South African Infrastructure Fund (31 percent), the Commonwealth Development Corporation (13 percent), and Bolloré (20 percent). At the end of 2002, Bolloré became the main shareholder with 64 percent, with Transnet remaining on 32 percent and management owning the remainder. In 2005 Bolloré sold its controlling interest in Comazar to Sheltam, originally a locomotive leasing company based in South Africa. Comazar is the rail operator in Ivory Coast, Cameroon and Madagascar and also has a controlling interest in the Kampala Dry Port.

### *2.3.3 NLPI*

NLPI is an investment company registered in Mauritius, owned by New Limpopo Bridge Projects, together with a group of South African finance institutions (Old Mutual, Sanlam, Nedbank Investment Bank, Gensec and Rand Merchant Bank). New Limpopo Bridge Projects is a private company aiming to promote infrastructure related projects in Sub-Saharan Africa through Build-Operate-Transfer (BOT)-based projects in which it provides the finance and management requirements.

Its first major project was the New Limpopo Toll Bridge over the Limpopo River at Beitbridge, which was jointly commissioned by the Presidents of South Africa and Zimbabwe in November 1995. This was followed by the Beitbridge Railway (BBR) and the Ressano Garcia concession in conjunction with Spoornet. In 2003 they were the successful concessionaire for the Zambian system and are currently involved in several other bids.

### *2.3.4 RITES*

RITES (Railways of India Technical and Engineering Services) is an engineering consultancy, owned by the Government of India, covering a number of infrastructure sectors, including railways. It has extensive overseas experience, including Africa, having provided management and staff to operate railways such as Nigeria and Botswana. In recent years it has expanded to also include equipment leasing (e.g. locomotives to Tanzania) and has recently begun to bid for rail concessions in its own right, initially in Tanzania but more recently in Kenya-Uganda, Congo Brazzaville and Beira, in the

latter of which it was the successful bidder. It is also reported to be undertaking rehabilitation work in Angola, financed by a loan from the Indian Exim Bank.

#### *2.3.5 RDC*

Railroad Development Corporation (RDC) is a privately-owned Pittsburgh-based railway investment and management company. It operates and owns, wholly or partly, seven railways, four of which are in Central and South America:

- the 1005 km Iowa Interstate Railroad, a regional carrier in the US Mid-West;
- the 5,350 km ALL Central (formerly the San Martin), operating between Buenos Aires and Mendoza in Argentina;
- the 2,740 km ALL Mesopotámica (formerly the Urquiza), linking Buenos Aires to north-east Argentina;
- the 322 km Ferrovías Guatemala connecting Guatemala City with the Atlantic Ocean;
- the 591 km Ferrocarril Central Andino connecting Huancayo and Cerro de Pasco with Lima and Callao in Peru;
- the 872 km CDN in northern Mozambique and the 797 km Central East African Railways in Malawi which together link Malawi with the port of Nacala, and
- the 693 km Eesti Raudtee freight railway in Estonia linking Russia with the Baltic ice-free port.

#### *2.3.6 CANAC*

CANAC (Canadian National Consulting) was for many years the well-known consultancy arm of Canadian National. It increasingly diversified into operations that were being out-sourced by linehaul railways and, in 2004, was bought by Savage, a North American company providing materials handling, logistics and transport services on all modes. CANAC currently provide industrial rail switching and transshipment services at a large number of locations in North America and have a long history of overseas consultancy and engineering services, including five years running the Ghana system in the 1990's. It is currently the operator for the Senegal/Mali concession and is involved in other current bids.

## 3 THE CONCESSIONS

### 3.1 Introduction

This chapter describes the key features of the thirteen concessions (Table 2-1) that have been completed to mid-2005. Many of them are relatively recent and it is too early to draw firm conclusions but four, Sitarail (Ivory Coast/Burkina Faso), Camrail, CEAR (Malawi) and Gabon have been operating for five years. In one of these, Gabon, the concession has failed; however, the circumstances were different to most other concessions in Africa[2] as the line had a dominant customer who was operating his own trains and paying access charges. For the other three concessions, there is over five years of history, although Sitarail has been affected by two closures due to civil war and CEAR by the non-completion of the adjacent Nacala franchise, which it feeds, and the collapse of a key bridge.

### 3.2 Ivory Coast/Burkina Faso (Sitarail)

This 1180 km meter-gauge railway runs from Abidjan in Ivory Coast to Ouagadougou in Burkina Faso and on to Kaya. Under the French colonial administration, it was operated as a single railway, and this continued following independence. Its performance declined steadily from the 1970's until, in 1989, it was split into two national companies. In 1992 the two governments decided to reunify and privatize

[2] There are some parallels with Magadi in Kenya and, to a much lesser extent, with TARC in Tanzania, both of whom operate trains over the government system.

the operation of the railway. A renewable 15-year concession was awarded in 1993 to Sitarail. The governments of Côte d'Ivoire and Burkina Faso each hold a 15 percent share, and staff hold 3 percent; and foreign companies associated with the Bolloré group hold the remaining shares (67 percent).

Sitarail commenced operation in 1995 and operates both passenger and freight services on a commercial basis. It is also responsible for carrying out the maintenance of the rail infrastructure and the rolling stock. However, the ownership of both the rail infrastructure and existing railway stock remains with the governments through "patrimony societies" and they are also responsible for financing renewal and development investment. Instead of purchasing the rollingstock at the start of the concession, Sitarail thus pays annual lease fees. This arrangement, termed "affermage," is unique in Africa to Sitarail.

Private sector operation commenced in August 1995. A five-year investment program, with financing arranged through development agencies, was completed in 2000. This program included the rehabilitation of various sections of track, structures, locomotives and wagons for approximately US$55m. The concession termination date was extended in 2001 by another 5 years.

Under the terms of the concession, Sitarail pays three sets of fees:

- A fee for usage rights as a percentage of annual turnover, set at 0 percent, 2 percent and 4 percent for the first three years of the concession, with fees for the remainder of the period set by triennial negotiations;
- A debt service charge, covering the interest and repayments of loans raised by the holding companies to finance capital investment; and
- A payment to a rollingstock fund, to cover rollingstock rehabilitation and renewal. For years four to fourteen of the concession, this was set at FCFA 829 million p.a. ($US2 million) indexed to inflation.

For the first seven years of its concession, Sitarail had the exclusive right to run services on the Abidjan-Ouagadougou route, as long as it could meet demand, although it could make voluntary arrangements with other operators if it desired. After this period, in principle, other train operators could be allowed but this provision was primarily intended to provide an alternative operator if Sitarail's performance was poor rather than to promote on-rail competition.

Sitarail can set its own tariffs[3] and service levels; although governments have the option to request (and fund) particular services, none have been requested to date.

Responsibilities for the maintenance of and investment in infrastructure and rolling stock are shared between Sitarail, the two patrimony societies and the two governments. Sitarail is solely responsible for ongoing maintenance but, where investment is carried out to renew or develop rail infrastructure, or to refurbish or acquire rolling stock, Sitarail prepares the investment program, and submits it to the relevant patrimony society; once the investment program is agreed the patrimony society then submits a financial proposal for approval to the relevant government, which is then responsible for raising the required finance, although the cost of debt service is borne by Sitarail. Sitarail had overall control for implementing the initial infrastructure investment program, subject to some procurement conditions, but subsequent programs were to be under the control of the patrimony societies.

Both passenger and freight traffic had declined throughout most of the 1980s and early 1990s, reflecting both stronger competition from road transport and a poor macroeconomic performance, but, from the mid-1990s, traffic recovered and grew steadily (Table 3-1). Freight traffic grew strongly to 2001, initially reflecting the impact of economic growth following the 1994 devaluation but largely the result of Sitarail's improved performance. The main traffics are now petroleum products (approximately 41 percent of freight revenues, with 75 percent of it coming from domestic oil traffic), containers (15 percent) and cereals (16 percent); the formerly important clinker traffic has reduced

[3] Except for domestic fuel traffic, which is a regulated rate.

substantially. However, in September 2002 the border was closed with the outbreak of the Ivory Coast civil war, and remained so until May 2003. It closed again when fighting broke out in November 2004.

Passenger traffic declined through the mid to late 1990s despite some improvement in the quality of service (including refurbishment of the rolling stock and an increase in the number of trains), as bus transport became increasingly competitive and loss-making domestic services were withdrawn in 1995. After 1999, passenger traffic began to recover and was doing well until the outbreak of war.

Freight receipts have continued to rise, both in aggregate and per traffic unit, although this is affected by changes in the traffic mix, particularly the growth in the high-earning (and semi-regulated) oil traffic[4]. Passenger receipts have fallen and now account for only about 15 percent of Sitarail's total revenues, compared to 20 percent at concessioning. Despite the improvement in freight volumes and revenues, Sitarail's working ratio (working expenses:revenue) was still only just under 90 percent in 2000, although it had improved markedly by 2002. Not surprisingly, they faced a large cash loss in 2003. Net profit, including non-operating costs, has been negative in six years out of eight between 1996 and 2003 and, more tellingly, cumulative cash flow has also been negative.

This was the first of the 1990's concessions in Africa and is atypical in that although Sitarail does not own the infrastructure (which is normal), neither does it own the rolling stock (which is not). In addition, all major investment is funded through the governments, with the concessionaire is responsible for debt service; this is unlike most other concessions, where the concessionaire is normally responsible for most infrastructure and rollingstock investment, other than that which comes as part of the concession package. The particular arrangements are time-consuming, involving up to five different local parties (Sitarail, the two patrimony societies, and the two Governments), plus external funding agencies where relevant, which caused a delay of two years in putting the initial rehabilitation program in place.

The standard of both the infrastructure and rolling stock had deteriorated significantly before concessioning. Even though Sitarail's concession agreement was signed in 1994, and became effective in 1995, implementation of part of the investment program was delayed until 1997, partly because of difficulties encountered in completing the necessary finance plan. The program, which was expected to be completed by 2000, involved a total expenditure of around 40 billion CFA francs (about US $80 million), funded from various multilateral sources, of which 24 billion was to be borne by Côte d'Ivoire. The investments included:

- major infrastructure renewal in both Côte d'Ivoire and Burkina Faso;
- the provision of new telecommunications;
- the refurbishment of 20 locomotives;
- the refurbishment of 600 freight wagons, and
- the refurbishment of 20 passenger coaches.

Overall, major improvements were achieved following the concessioning of the railway. Freight traffic increased significantly since the start of Sitarail's concession and shippers reportedly recognized major improvements in quality of service. Some loss-making domestic passenger services were withdrawn when Sitarail took over the concession, and the number of passenger using the remaining international services declined for some years but then were beginning to grow again. By 2001, the outlook was reasonably bright but the two interruptions caused by civil war have since caused a severe dislocation to the business.

[4] The rate for domestic oil traffic within Ivory Coast is regulated by the government and in 2001 was estimated at over US$0.13/ntk. Transit oil is also partially regulated to Sitarail, reportedly to minimise leakage of "transit" oil into the Ivory Coast domestic market.

**Table 3-1. Key Performance Indicators – Sitarail.**

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tonnes (000) | 540 | 490 | 490 | 290 | 332 | 305 | 504 | 596 | 643 | 806 | 876 | 1,016 | 867 | 180 | 569 |
| Ntk (mill) | 389 | 374 | 359 | 258 | 249 | 252 | 451 | 505 | 527 | 538 | 523 | 699 | 603 | 129 | 501 |
| Pass (000) | 917 | 927 | 820 | 744 | 858 | 410 | 413 | 379 | 269 | 243 | 300 | 400 | 321 | 88 | 178 |
| Pax-km (mill) | 205 | 199 | 189 | 173 | 186 | 161 | 158 | 155 | 119 | 93 | 126 | 182 | 148 | 10 | 25 |
| Revenue (€ 000) | | | | | | | | | | | | | | | |
| Freight | | | | | | | 16.1 | 23.0 | 21.1 | 22.9 | 23.3 | 29.7 | 25.9 | 5.5 | 17.7 |
| Passengers | | | | | | | 4.0 | 4.7 | 3.1 | 2.8 | 3.7 | 5.9 | 5.0 | 0.3 | 3.8 |
| Other | | | | | | | 0.5 | 0.5 | 0.8 | 1.1 | 0.2 | 0.5 | 0.3 | 0.2 | 0.3 |
| Total | | | | | | | 20.5 | 28.3 | 25.0 | 26.8 | 27.2 | 36.1 | 31.2 | 6.0 | 21.7 |
| | | | | | | | | | | | | | | | |
| Working Exp. | | | | | | | 18.7 | 24.9 | 20.7 | 22.2 | 24.2 | 26.7 | 26.7 | 9.3 | |
| Operating Exp. | | | | | | | 20.1 | 26.1 | 20.8 | 22.3 | 24.4 | 26.9 | 26.9 | 9.5 | |
| Employees | 1,837 | 1,806 | 1,918 | 1,817 | 1,811 | 1,825 | 1,842 | 1,808 | 1,827 | 1,781 | 1,712 | 1,620 | 1,655 | 1,570 | 1,451 |
| 000TU/staff | 323 | 317 | 286 | 237 | 239 | 226 | 331 | 365 | 354 | 354 | 379 | 544 | 454 | 89 | 363 |
| | | | | | | | | | | | | | | | |
| Locos | 36 | 41 | 39 | 37 | 37 | 39 | 13 | 13 | 17 | 20 | 20 | 20 | 20 | 20 | 19 |
| Wagons | 783 | 783 | 783 | 786 | 581 | 600 | 653 | 584 | 627 | 728 | 767 | 794 | 760 | 760 | 833 |
| Coaches | 83 | 69 | 71 | 75 | 75 | 75 | 14 | 13 | 23 | 21 | 20 | 23 | 25 | 25 | 27 |
| | | | | | | | | | | | | | | | |
| Route-km | 1,155 | 1,155 | 1,155 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 | 1,26 | 1,260 |

*Source. Sitarail and IBRD Rail Database.*

### 3.3 Cameroon

The 1100 km meter-gauge network in Cameroon was operated by the government-owned Régie Nationale des Chemins de Fer de Cameroun ("Regifercam") from 1947. It consists of a main line running north-east from the port of Douala to Yaoundé, and then to Ngaoundere, which also serve as railheads for traffic from Chad and Central African Republic, and two short regional lines in the north-west of the country. As many of the roads are poor, the railway plays an important role, with export timber and cotton shipped to the port.

Although Regifercam reduced its workforce from about 6,000 employees in 1988 to 3,800 employees by 1994, it was still a financial burden on the economy, with major investment needs on the horizon, and in 1994 the Government decided to privatize it through a competitive tender. At the end of the process, two groups had submitted financial offers: one group consisted of SAGA/SDV (both Bolloré companies) and Systra, a subsidiary of the French Railways (SNCF) and the other of Comazar, at that time majority-owned by Transnet (see Section 3.4.2). The government awarded the concession to SAGA/SDV but requested that they use Comazar as the operator rather than Systra, which they did.

The company which was awarded the concession, Camrail, had a structure in which Bolloré and Comazar formed a 60 percent - 40 percent partnership in a holding company called SECAF; this owned a controlling interest (66 percent) in another holding company Société Camerounaise des Chemins de Fer (SCCF), with 17 percent ownership separately held by Cameroon subsidiaries of SDV and SAGA[5]. SCCF in turn owned 85 percent of Camrail, the actual concession manager and operator, with the government owning 10 percent and 5 percent owned by employees. Camrail began operations in April 1999.

Camrail has a 20-year rolling concession to operate, maintain and improve the railway infrastructure and to manage the railway property, which may be extended for five years every five years. The Government retains the legal ownership of the fixed assets. Camrail selected the rolling stock that it then leased for eight years, with a subsequent option of purchase; it can also may buy and sell its own equipment, with the government retaining a right of first refusal on any sale of any rolling stock.

The company has the right to make infrastructure investments and agreed to undertake an investment program of approximately US$ 92 million over a 5-year period, 58 percent funded by loans from the World Bank/IDA, the French and German development agencies, and the European Investment Bank and 42 percent funded by equity and retained earnings. Infrastructure (mostly north of Yaoundé) was about half the total, with rehabilitation of rolling stock about one-fourth of the program.

Camrail was required to take over 3,000 employees from Regifercam, out of the pre-concessioning total of 3,400, reducing to 2,800 after the first year of operation with the retrenchment costs borne by the government.

For commercial services, Camrail is free to establish tariffs and to enter into contracts with shippers and suppliers. Camrail is also obliged to provide some specified non-commercial services for which it is compensated, including regular passenger omnibus services for stations that are not connected to all-weather roads. Because of the strong competition from trucking, no price regulation was felt to be needed. Camrail had an exclusive operating monopoly for the first five years, after which other operators could be allowed if the concessionaire were found to be abusing its rail operating rights or to be discriminating against clients.

The concession payments consist of:

- A fixed amount of $US 862,000 p.a., escalated according to industrial prices
- A variable amount of 2.25 percent of revenues in the first year, 3 percent in years 2-5 and a negotiated amount not less than 5 percent from year 6 on

[5] This combined 34 percent holding was expected to be sold to clients of the railway.

At the time of concessioning, the usual lack of track and rolling stock maintenance had led to low service quality and the condition of some of the infrastructure was poor, especially north of Douala.

Financial and operating performance is summarized in Table 3-2 on the following page. There have been two major problems during the concession:

- The passenger service was to be operated by Camrail in return for a PSO payment from the Government. Whilst Camrail has indeed operated these services, the Government has not made these payments,; these should typically been € 3-4 million p.a., about 40-50 percent of the fare-box revenue collected from passengers
- The investment of $92 million described above was meant to begin immediately the concession began. In practice, as the finance was not then in place, it was delayed for four years, during which time the infrastructure continued to deteriorate with knock-on effects on the rollingstock.

The financial forecasts of the concessionaire at concessioning anticipated a rapid and sustained turnaround, with the overall concession expected to have a return of 16.6 percent. The projections anticipated immediate revenue growth of about 10 percent, with subsequent slower growth; this has been easily achieved, with revenue up by 50 percent compared to the late 1990's. However, operating costs have proved harder to control, with the working ratio hovering around 90 percent in recent years.

Camrail is an important concession, not least because it is the only one of those concessioned prior to 2000 that has not faced major disruptions, either from war, natural causes or by termination. Its financial performance, whilst positive, has by no means achieved the margins that were anticipated in the financial projections at concessioning and, given the substantial investment program it has undertaken, its financial sustainability must be due in large part to the low-cost financing terms for loans from the development agencies and banks.

### 3.4 Gabon

The 684 km Transgabonais railway (TG), built as a high-quality standard-gauge line with 25 tonne-axle load between 1974 and 1986, connects the port of Owendo, near Libreville, with Franceville, in the interior. Although it carries both general freight and passengers, its primary traffics are manganese ore (65 percent) and logs (20 percent). The manganese is mined by Compagnie Minière de l'Ougooué (Comilog), 30 percent owned by the state and 70 percent by Eramet, a French mining group. Under a 1989 Government agreement, Comilog provided its own equipment and operated its own rail services, paying an access and usage charge to the state rail company L'Office du Chemin de Fer Transgabonais (Octra).

Prior to 1988, the manganese was transported via cable railway to Congo for rail shipment through the Congolese port of Ponte Noire on Chemin de Fer Congo-Ocean (CFCO). Between 1988 and 1991, transport of the ore was shared between the two railways but from 1991 all manganese exports traveled over the TG. Octra meanwhile was responsible for infrastructure and handled all passenger and non-manganese cargo traffic. Prior to concessioning, Comilog shipped about 1.5 million tonnes of manganese ore over the railway annually, representing about 43 percent of railway tonnage and 65 percent of tonne-km. The railway also carried about 192,000 passengers and just over 1 million tonnes of non-manganese freight in 1996. Total revenues were about CFA francs 22 billion ($US 43 million), of which 77 percent were from freight, 13 percent from passengers, and just 8 percent from Comilog. Tariffs for Octra freight were relatively high and there were increasing complaints about the quality of service.

Although the development of an all-weather road network will probably progressively capture a share of the passenger and general freight traffic, there are now proposals to access the iron ore deposits in the north-east of the state and this would probably use the TG, joining about half-way along.

**Table 3-2. Key Performance Indicators – Camrail.**

| | 1992/3 | 1993/4 | 1994/5 | 1995/6 | 1996/7 | 1997/8 | 1999/00[1] | 2000/1 | 2001/2 | 2002 [2] | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tonnes (000) | 1,206 | 1,417 | 1,452 | 1,138 | 1,464 | 1,426 | 1,885 | 1,755 | 1,901 | 983 | 1,830 | 1,835 |
| Ntk (000) | 592 | 756 | 812 | 607 | 868 | 850 | 1,138 | 1,063 | 1,159 | 596 | 1,089 | 1,114 |
| Passengers | 1,944 | 1,752 | 1,728 | 1,675 | 1,487 | 1,250 | 1,582 | 1,409 | 1,159 | 604 | 1,109 | 1,003 |
| Pax-km (000) | 398 | 334 | 316 | 301 | 306 | 283 | 384 | 351 | 303 | 168 | 319 | 297 |
| Transit traffic | | | | | | | | | | | | |
| Tonnes | | | | | | | | | | | 668 | 715 |
| | | | | | | | | | | | | |
| Revenue (€ million) | | | | | | | | | | | | |
| Freight | 20.3 | 26.7 | 32.2 | 25.6 | 34.6 | 34.9 | 46.9 | 46.4 | 56.2 | 29.0 | 52.9 | 53.4 |
| Passengers | 6.2 | 5.0 | 5.0 | 5.9 | 4.9 | 4.8 | 8.9 | 7.0 | 7.4 | 4.3 | 7.8 | 8.0 |
| Other | 0.0 | 0.0 | 0.7 | 0.5 | 0.7 | 0.7 | 0.1 | 0.0 | 0.9 | 0.3 | 0.4 | 0.5 |
| Total | 26.6 | 31.7 | 37.9 | 32.1 | 40.3 | 40.4 | 55.9 | 53.4 | 64.4 | 33.6 | 61.2 | 61.9 |
| Working exp | 22.8 | 22.8 | 23.7 | 28.8 | 32.8 | 32.4 | 56.0 | 48.1 | 51.4 | | 45.6 | |
| Op. exp | 34.9 | 35.2 | 36.6 | 41.4 | 46.5 | 45.9 | 58.3 | 54.7 | 58.1 | | 56.0 | |
| | | | | | | | | | | | | |
| Employees | 3,856 | 3,800 | 3,714 | 3,620 | 3,538 | 3,440 | 2,711 | 2,710 | 2,629 | 2,621 | 2,542 | 2,391 |
| 000TU/staff | 257 | 287 | 304 | 251 | 332 | 329 | 449 | 522 | 556 | 583 | 554 | 590 |
| | | | | | | | | | | | | |
| Locos | 61 | 61 | 61 | 61 | 61 | 61 | 66 | 70 | 70 | 67 | 72 | 67 |
| Wagons | 1,417 | 1,407 | 1,396 | 1,360 | 1,354 | 1,352 | 1,359 | 1,162 | 1,304 | 1,310 | 1,305 | 1,289 |
| Coaches | 76 | 77 | 77 | 76 | 76 | 76 | 84 | 68 | 68 | 68 | 65 | 65 |
| | | | | | | | | | | | | |
| Route-km | | | | | | | | | | | | |
| Track-km | 1,104 | 1,104 | 1,007 | 1,007 | 1,007 | 1,007 | 1,016 | 1,016 | 1,016 | 1,016 | 1,004 | 1,004 |

*Source. Camrail and IBRD; revenue excludes unpaid PSO compensation.*

*(1) 15 months.*
*(2) 6 months.*

The long-term viability of the railway clearly hinges on the access charge paid by Comilog, which represented 65 percent of the freight tonnage. This had been established partly on a cost basis and partly on the cost of alternative routes. A 1986 agreement established the principle that the costs of using the TG should be below those of the CFCO route and low enough to enable Comilog to compete on the world market and, in 1989, the Comilog payments were set at about 220 million CFA francs p.a. (about $US 800,000 at the time) over the next ten years, and Comilog was also selected as a contractor for track maintenance. In 1994, a further agreement was negotiated by the government of Gabon based on the cost of transport via Gabon not being higher than that via CFCO and that the charges by Octra should be based on marginal costs[6]. Prior to concessioning, independent studies found that the mineral transport was being subsidized and that this situation would become worse as railway assets aged and needed renewal.

The railway thus had two operators at concessioning, with the one hauling the bulk of the traffic paying comparatively low access charges. The comparison between the condition of the Comilog and Octra fleets in 1996, prior to concessioning, is illuminating, given that the age of the assets would in general have been 10-15 years: Octra had 34 locomotives, of which about 40 percent were in service, and about 1,000 wagons, with 65 percent in service; Comilog had 16 locomotives and 264 wagons in mining use, with about 90 percent in service. The infrastructure at that time was in good condition, with the exception of some bridges from the initial segment of construction. Octra had about 2,000 employees in 1996 of which about 1,300 were associated with operations, 500 with administration, and over 200 with non-railway activities.

Despite growing revenues, Octra continued to suffer operating losses through the period prior to privatization and was in a weak financial position. In 1996, the government decided to offer the railway as a rolling concession of not less than twenty years, which could be extended in five-yearly increments. The concession company would operate rail services for general freight (including timber) and passenger services, and would be responsible for the maintenance and replacement of railway equipment, rolling stock, and infrastructure.

The concessionaire was free to determine tariffs, services, and investment during the period of the concession but paid a concession fee for the existing infrastructure. He had exclusive access to the network, except for usage by Comilog, and acquired the Octra rollingstock that he required, leaving the equipment that was unusable[7]. Payment to the state, of not less than 20 billion CFA francs (about $40 million), was to be made over five years. A minimum level of passenger service was required, specified in terms of frequency and capacity and the government would retain a share of approximately 15-20 percent, with some “golden share” provisions.

The concession fees had two components: an annual lump sum (inflation adjusted) starting at 200 million CFA francs ($0.4 million) in years 1 and 2, increasing to 1,000 million CFA francs ($2 million) from years 6 -20 and a variable element set at 12 percent of the “surplus operating profit,” (as defined by Gabonese law: this is roughly equivalent to operating revenues minus the costs of materials, labor, insurance, and duties and taxes). The concessionaire had to negotiate an access agreement with Comilog; the government undertook the access charge would cover costs and be at least 6 CFA francs per net tonne-km for a level of traffic of 1.75 million tonnes. The concessionaire also had to provide a minimum investment program from the concessionaire.

Two groups progressed to the financial proposal stage. One was Transgabonais, a consortium led by the Gabonese National Timber Company (SNBG), the main shipper of timber products, while the second (Gabonrail) was led by Comilog. This development, together with the requirement that any bidder should have reached agreement on access charges with a rival bidder, was clearly a potential problem. After various arguments, the Comilog group decided not to submit a financial offer, leaving the field open to Transgabonais. After further negotiations, Transgabonais was awarded the concession in late 1998 and began to negotiate an agreement with Comilog. However, in addition to its problems with Comilog, it also faced lack of co-operation from the Octra management. It took over

[6] Given the large proportion of traffic that was from Comilog, and their high axle-loads, the marginal cost would almost certainly have been very close to average cost, if calculated properly.

[7] During the period before the handover, there was a running down of the railway assets, including stripping many locomotives of copper components, so that when the concessionaire took over there were only 4 operational locomotives.

the railway in late December 1999, aiming to employ about 1300 of the Octra staff. At the time of handover there had been no corresponding actions on regulatory capacity, in particular the follow-up of the conditions of the concessioning contract.

In the circumstances, it was unlikely that Transgabonais would be in a very strong position to negotiate a realistic access charge with Comilog and this proved to be the case. In May 2003, the concession was cancelled, due to reported "non-accountability of activities and poor maintenance" and the railway was operated, pending re-concessioning, by Societe d'Exploitation du Transgabonais (Setrag), a subsidiary of Comilog. Setrag claim Transgabonais "only" undertook "less than half" of the five-year investment plan during the three years they had control and claim there is a need for CAF francs 51 billion ($100 million) of "catch-up" works on infrastructure and rollingstock. The disparity in charges can be seen from the current rates: the access charge for the COMILOG traffic is CAF francs 4.7/ntk[8] (about $0.009/ntk), whilst the charge for general traffics averages about CAF francs 50/ntk ($0.093/ntk). The access charge is low by any standards, particularly for a high-quality line only 25 years old which requires such large "catch-up" works, and for traffic which, according to some reports, has priority even over passenger trains.

This concession illustrates the difficulties in awarding a concession where one of the main customers has very strong market power, and strong political links, and there is no countervailing regulatory power. The concession was only going to work with an extremely strong regulator, of a kind that is in very short supply throughout the world; in practice, there was only ever going to be one winner.

### 3.5 Malawi

The 787 km Malawi railway was historically linked to Beira via a southern connection to the Sena line in Mozambique but in 1970 a connection was built to the inland CFM line from Nacala and it thus gained a second outlet.[9] In 1982, the southern route was closed due to war in Mozambique and damage to the Zambesi bridge, and Malawi became totally dependent on the Nacala line. That also was damaged and closed for several periods of the war. After the war, the EU funded its rehabilitation over most of its length, as far as Cuamba. However, the Cuamba –Entre Lagos connection to the border remains in very poor condition, with average speeds of no more than 10-15 km/hr and this has been a severe constraint on train operation in the corridor. The southern leg of the Malawi network was further affected when in 1997, the Shire River washed away much of an embankment, 77 km north of the border. As a result, there has been no traffic of any kind south of this point for nearly 10 years. The northern arm of the network runs due west through Lilongwe to the Zambian border. There has long been a scheme to extend this line into Zambia as part of a major east-west corridor running from Nacala into central Africa and then to the Atlantic; some 26 km of earthworks have already been constructed (and an isolated 3 km of track laid) but it is unlikely it could be justified by the potential traffic.

In December 1999, Central East Africa Railways (CEAR) took over the 20-year concession on the Malawi Railways, renewable in 5-year tranche-; this is effectively the same consortium (see Section 3.14) that operates the concession to Nacala on the Mozambique side of the border.

The terms of the concession are:

- 5 percent of gross revenues (with a minimum of $0.5 million p.a.) plus $0.5 million initial payment;
- $0.9 million p.a. for five years for the rollingstock (18 locomotives and 410 wagons), and
- operate two passenger services for the first five years of the concession, for which a payment of $150,000 has been made by the Government, effectively netted off against the concession fee. There-after, the payment and service offered will be by negotiation.

The concession operated reasonably well for the first two years, although the delay in closing the concession in Mozambique meant it was still dependent on CFM for the Mozambique leg of the trip.

[8] This is after apparently being increased by 50 percent in 2002.

[9] It also meant the Nacala line was now connected to the rest of the Mozambique system and a substantial volume (250,000 tonnes) of intra-CFM traffic did transit over the Malawi network at that time.

This clearly created operational difficulties, particularly as it appears that CFM did little heavy maintenance during this period, creating a poor level of service for the corridor as a whole. This fed into the CEAR finances and until 2002 it was cash-negative. 2002 was a better year, with a working ratio of 96 percent, but in January 2003 a bridge at Rivi Rivi was destroyed by Cyclone Delfina and the northern arm of the network, including Lilongwe, cut off from the rest of the network. This effectively killed-off almost all local traffic[10], which dropped from 183,000 tonnes in 2002 to about 20,000 tonnes p.a. and also marooned rollingstock and two locomotives north of the bridge. The bridge was repaired using grant funds from DFID but this took over two years to be completed, only returning to service in May 2005. Table 3-3 summarizes key indicators for the period before and after the concession.

Traffic increased immediately CEAR took over, by about 100,000 tonnes on an equivalent annual basis, largely import/export traffic. Passenger traffic also appears to have increased substantially, although this may mainly reflect greater efficiency in collecting revenue. Traffic was still growing when the Rivi Rivi bridge was destroyed; the impact on domestic traffic is clear, with it declining to only 8 percent of total traffic in 2004. The impact on import/export traffic was less marked, as most of this originates in the south, but still significant at about 20 percent. Passenger service frequency and capacity were augmented in 2002, and revenue collection on one of the services contracted out on a commission basis, and recorded passenger traffic increased sharply in 2002, although it fell back in 2003.

Staff fell by over 30 percent, and have since declined by a further 20 percent; labor productivity had approximately doubled by the time the Rivi Rivi bridge was destroyed. The decline in labor productivity since reflects the policy of retaining staff in anticipation of the re-opening, which was repeatedly postponed until the funding procedures were completed. The productivity for the combined Malawi and Nacala concessions is likely to be about 300-350,000 traffic units per employee.

The concession was required to operate return services between Limbe (near Blantyre) and Makande in the south and Nayuci in the north, one three times a week and the other twice weekly, for the first five years of the concession (i.e. to December 2004). This was more than complied with but the service level has currently been reduced to weekly on both routes pending agreement on the on-going funding arrangements. The service represents a significant commitment of resources: in 2003, the last full year of passenger operation, 98,000 passenger train-km were operated, about 40 percent of the total train-km. The combined revenue and PSO was about US$450,000; estimates of the avoidable cost of the current service are around twice this figure and the concessionaire is understandably reluctant to continue in the absence of clear funding arrangements.

The concession has had a working ratio over 100 percent since its start, apart from in 2002. The concession fee has been a relatively large part of expenses, with the minimum fee of $500,000 paid each year; this represented about 15 percent of revenue in 2003 and 2004,[11] a very large proportion.

Although the locomotive fleet appears to have increased substantially, this is misleading. The concessionaire purchased 13 mainline locomotives as part of the concession and then subsequently purchased seven shunting locos and 4 mainline locos from scrap yards; out of these purchases it has created one running mainline locomotive and three shunting locomotives but meanwhile two locomotives were crashed in Mozambique, and four others are undergoing refurbishment or awaiting spare parts, leaving the company with eight working mainline locomotives and three shunting locomotives. The working wagon fleet is similarly 396 wagons, compared to the 478 on the books.

This concession has faced two very significant difficulties not of the concessionaire's making; the delay in finalizing the Mozambique concession, which appears to have been largely caused by inter-governmental negotiations, has been a severe handicap, affecting both traffic volumes and operational efficiency; funding the damage to the Rivi Rivi bridge, whilst a natural disaster, also seems to have taken a long time to resolve. In the meantime, the concession has been steadily cash-negative, with the concessionaire having paid out $5 million in entry fees and rollingstock purchases and lost a further $1-2 million in operations and incidental capital purchases.

[10] However, some 90,000 tonnes of that local traffic was clinker from a quarry which was very close to being worked out and has since been closed, with the cement works now being supplied from Zimbabwe by road; this traffic will not return to rail.

[11] Revenue in 2004 was artificially high as "other revenue," which includes hire charges for locomotives in Mozambique and demurrage, was boosted by the collection of long-overdue demurrage from one customer.

**Table 3-3. Key Performance Indicators – CEAR Malawi.**

| | 1995 | 1996 | 1997 | 1998 | 1999(1) | 2000(1) | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tonnes (000) | 367 | 252 | 317 | 311 | 344 | 506 | 448 | 463 | 273 | 240 |
| Incl. Imp/exp | 113 | 103 | 138 | 144 | 147 | 249 | 275 | 280 | 233 | 223 |
| Ntk (mill) | 63 | 43 | 51 | 50 | 56 | 87 | 70 | 73 | 41 | 38 |
| Passenger (000) | 431 | 465 | 451 | 452 | 349 | 420 | 369 | 603 | 487 | 395 |
| Pax-km (mill) | 22 | 26 | 17 | 21 | 19 | 27 | 22 | 37 | 30 | 26 |
| Revenue (Kw million) | | | | | | | | | | |
| Freight | 40 | 54 | 66 | 104 | 185 | 302 | 309 | 327 | 229 | 257 |
| Passengers | 4 | 4 | 7 | 6 | 14 | 22 | 20 | 29 | 30 | 23 |
| Other | | | | | | 65 | 58 | 52 | 55 | 108 |
| Total | 60 | | | | | 390 | 387 | 408 | 314 | 375 |
| Expenses (Kw million) | | | | | | | | | | |
| Working expenses | 50 | | | | | 429 | 413 | 393 | 359 | 429 |
| Operating cost | 74 | | | | | 441 | 429 | 411 | 375 | 448 |
| Operating ratio (%) | 123 | 116 | 122 | 136 | 110 | 113 | 111 | 101 | 114 | 114 |
| | | | | | | | | | | |
| Employees | 1117 | 999 | 1014 | 967 | 952 | 643 | 642 | 572 | 534 | 496 |
| 000TU/employee | 76 | 69 | 67 | 73 | 86 | 164 | 143 | 192 | 133 | 129 |
| | | | | | | | | | | |
| Locos | 55 | | 13 | 13 | | 18 | 21 | 24 | 24 | 24 |
| Wagons | 706 | | 398 | 383 | | 435 | 485 | 485 | 478 | 478 |
| Pax cars | 29 | | 28 | 28 | | 18 | 18 | 18 | 17 | 17 |
| | | | | | | | | | | |
| Route-km | 789 | | 710 | 710 | 710 | 710 | 710 | 710 | 710 | 710 |

*Source. CEAR and various.*

*(1) 1999 was an eleven-month year and 2000 a 13-month year (pre- and-post concessioning).*
*(2) Statistics vary, sometimes significantly, between different sources.*

### 3.6 DRC

This was a short-lived "concession" (actually a five-year performance-based management contract) in which a consortium of Transurb and Transnet assumed responsibility for the network from Zambia north into the DRC minerals belt. The arrangement lasted about two years, at which point the foreign management was arbitrarily ejected by the military.

In April 1991, SNCZ, the national rail company created in 1974 following the nationalization and regrouping of the previous companies was split into four new public entities: the SNCZ holding company, OCS (southern railways), SFE (eastern railways) and CFU (Uèle railways). The Kinshasa-Matadi railway (CFMK) was transferred to Onatra, the national transport organization also responsible for the ports and river transport. In August 1994, Transurb was asked to review the situation of the southern and eastern railways and develop a recovery plan for the inter-connected network. Transurb proposed the privatization of the operation of the railways and this was subsequently granted to Sizarail, a specially-created company whose shareholders were Comazar (51 percent)[12], SNCZ (20 percent), Gécamines (12 percent), Banque Commerciale Zairois (BCZ) (10 percent) and Societe Minerale de Bakwanga (Miba) (7 percent).

Sizarail took over in July 1995 for a period of five years. In November 1995, SNCZ, OCS, SFE and CFU were formally dissolved and combined into a new SNCZ company. In May 1997, during the civil war, Sizarail was "renationalized" by the Alliance led by Kabila and in August the expatriate management was removed and expelled and the assets seized.

Sizarail claim that during their period of control they undertook considerable rehabilitation (including 350 km of permanent way, telecommunication systems, 24 locomotives and about half the 1969 wagons). They also started a suburban service in Lubumbashi used by 2 million passengers per annum and increased long-distance passengers from 80 000 passengers in 1994 to almost 350 000 passengers (189 million passenger-km) by 1996, with freight doubled to over one million tonnes (446 million net tonne-km).

### 3.7 Beitbridge Railway

The Beitbridge Bulawayo Railway (BBR) is the only concession in recent times in the classical BOT form of constructing a new line (as distinct to rehabilitation) and subsequently operating it. The route runs from Beitbridge, on the South African border on the Limpopo, to Heany Junction, near Bulawayo, where it rejoins the main Zimbabwe system. There was about 150 km of new construction at the eastern end, with the western end consisting of the existing 170 km Nicholson West branch, a sharply-graded branch line which received some upgrading; when the 28 km of NRZ track from Heany Junction to Mpopoma yard in Bulawayo is included, the BBR trains operate over 345 km. It is 184 km shorter than the previous National Railways of Zimbabwe (NRZ) route via Somabhula.

The history of the project dates back to the 1960's, but until Botswana Railways was separated in 1987, there was little incentive for NRZ to construct the line as they would have created a short-cut reducing their haul to South Africa by about 400 km compared to the existing route via Mafeking[13].

BBR is a privately-owned Zimbabwe registered railroad company. NLPI own 85 percent of the shares while NRZ has the remaining 15 percent. The line was opened in July 1999 at a reported cost of US$85 million, having been constructed in 17 months. It was designed to Spoornet standards, with a 20 tonne axle-load, and has a capacity of 4 million tonnes p.a. It is operated by Spoornet under contract. It is claimed to have reduced the transit time from six days to only nine hours, but this must largely reflect the current operating difficulties of NRZ rather than the inherent time saving of the route itself. Spoornet operate the line using local staff (some being retired NRZ employees) but with hired Spoornet equipment.

[12] At that time jointly owned by Transnet and Transurb.

[13] BBR claim the decision to establish the new line in Zimbabwe was due to reoccurring problems in oil supply (which was mostly by pipeline from Beira) arising from the long -term repercussions of Mozambique's civil war and was made after the construction of an alternative oil pipeline proved non-viable.

The terms of the concession have never been made public; it is understood they have included clauses requiring (or encouraging) NRZ to direct as much traffic as possible over the line. For example, one of the agreements between BBR and the Zimbabwe government has a “take or pay” clause covering oil carried for the National Oil Company of Zimbabwe. It is understood that at times this has led to oil traffic for Harare being diverted south onto the BBR and then reconsigned from Bulawayo, adding over 100 km to the distance traveled. A similar clause is thought to apply to all traffic between the south and Zambia and DRC. Strenuous efforts have been made to dissuade NRZ from consigning or accepting traffic to or from the generally lower-rated Botswana Railways route, even where it is also the shortest route. This has led to an almost complete cessation of transit traffic through Botswana, with transit traffic declining from 800,000 - 1 million tonnes in the late 1990’s to its current level of under 100,000 tonnes.

Little published information is available about either traffic volumes or rates. However, it is understood that there are three pairs of trains daily, with a maximum load of 1500 tonnes gross. This probably represents about 1-1.5 million tonnes p.a., which is consistent with the drop in traffic through Botswana. The rate is typically about Rand 80/tonne (although some examples are much higher), equivalent to about 3.5-4 US c/ntkm.

Reflecting the continuing deterioration in NRZ’s ability to operate, it is reported that in 2004 NLPI signed a further agreement with the Zimbabwe government, which allowed the consortium to operate over the Bulawayo-Victoria Falls line; as it also controls RSZ, it is thus effectively now operating Spoornet-hauled services from South Africa through to the DRC border.

### 3.8 Togo

The railway in Togo progressively deteriorated to the stage where its operations were managed by CANAC under a five-year contract from 1995. Following the departure of CANAC at the end of 1999, the only traffic remaining is clinker between Taligbo and Lome, operated over a private line and some 19 km of the previous main line by WACEM (West African Cement Company, former Cimtogo), to whom the line and operations were transferred in 2002. No details are available on the arrangements.

### 3.9 Ressano Garcia

The Maputo Corridor links the main industrial and manufacturing Rand area of South Africa, centered on Johannesburg, with the Mozambican ports of Maputo and Matola. These are about 400 km closer to the Rand than Durban, and about 800 km closer for traffic coming from Zambia and Zimbabwe. The corridor contains the upgraded N4 toll toad and a railway, crossing the border at Ressano Garcia. South Africa exports about 2 million tonnes p.a. through the port (Table A2-1), about 80 percent of which is coal.

Although the rail line suffered substantial decay during the 1980’s, and was a military target in Mozambique's civil war, the line was never closed. However, with the last general rehabilitation having been in 1977, it is now run-down and subject to severe speed restrictions. In 1998, a consortium known as the Ressano Garcia Railway Company (RGR), including NLPI and Spoornet, was named preferred bidder for a concession to upgrade the corridor, but then talks deadlocked on financial arrangements. In December 2002, a concession was eventually signed with a consortium consisting of NLPI/Spoornet (51 percent) on one side and the CFM (49 percent) on the other. Under the agreement, RGR is to rehabilitate the line from Ressano Garcia and Maputo, as part of a project to revive traffic through Maputo, which historically was a major outlet for northern South Africa, as an alternative to the congested ports of Durban and Richards Bay.

The concession includes the railway line from Ressano Garcia on the Mozambique South Africa border to the marshalling yard at Machava, a distance of 78 km, as well as providing access rights to the port of Maputo as well as the coal terminal at Matola. This last link is in particularly poor condition but is excluded from the concession and is the responsibility of CFM.

The port of Maputo was concessioned in 2003 for fifteen years, with a ten-year extension, to the Maputo Port Development Company (MPDC), which is 51 percent owned international interests led by Mersey Docks and Harbour and 49 percent by CFM, which includes 16 percent held for future local

investors. MPDC is vested with the powers of a port authority and will be responsible for marine operations, towage, stevedoring, terminal and warehousing operations as well as port planning and development. The status of the existing independent cargo terminals at Maputo and Matola for containers, sugar, citrus, aluminum, cereals and, most importantly for the Ressano Garcia line, coal will continue unchanged within the new port authority. Most of these have already been leased by CFM. The budget for the initial 3-year capital program is approximately US$70 million.

The duration of the rail concession is for a period of 15 years[14]; the amount of proposed investment is not clear, but most sources quote an investment of US $10 million[15] to rehabilitate and modernize the railway line to the same standard as the South African network.

RGR had projected that freight traffic would increase from 2.9m ton per annum at the time of the original negotiations to more than 6.8m by the end of the concession. Instead, it is reported that by 2003, traffic had fallen to 1.8 million tonnes, of which 1.45 million was coal, hauled in four coal trains daily[16]. The initial projections that there would be payments to CFM of an estimated $ 67.7 million over the initial 15 year period of the concession would almost certainly have been conditional on the forecast tonnages being achieved.

In the circumstances, the stagnation in traffic volumes, lack of maintenance by CFM of its complementary infrastructure and the general difficulties being experienced domestically by Spoornet, it is perhaps not surprising that, although signed in December 2002, the concession proper has still not begun as far as is known[17], and it is understood Spoornet, in particular, is reviewing its commitments.

### 3.10 Senegal/Mali

Mali has historically had a choice of routes to ports, with overseas trade principally shared between Dakar in Senegal and Abidjan in Ivory Coast. In colonial times, the primary route was the 1230 km Dakar-Bamako line, which was operated as a single entity but in 1960, on independence, two separate national railways were created, Regie Chemin de Fer Senegal (RCFS) and Regie Chemin de Fer Mali (RCFM). The route functioned poorly as a through corridor; between 1960 and 1963 there was no international traffic at all. Later, when there was some international traffic, there was poor co-ordination and for many years pressure to recreate a single organization. Both railways had internal traffic, RCFS has some branches and a Dakar commuter service and there is no direct road between Bamako and Keyes, the main intermediate town on the Mali side of the border (and some 435 km from Bamako)[18]. In the early 1990's, Malian trade through Abidjan more than doubled whilst that through Senegal grew only slowly and in 1995 a new joint operator, the Organisme Commun de Gestion du Trafic International (OCGTI), was created to be responsible for managing all traffic on the Dakar-Bamako line, although the operations continued to be undertaken by the national railways, with locomotives changed at the border. At that time, international traffic represented about 95 percent of the freight net-tonne-km on RCFS and 90 percent on RCFM; there were two passenger trains per week and about four freight trains departing per day. International traffic was averaging about 450-500,000 tonnes p.a. and passenger traffic was about 90,000 passengers p.a.

However, largely because of OCGTI's reliance on the national railways for actual operations, it did not prove successful and in 1998 a further stage was introduced in which operations were also isolated from the national companies through the creation of a Société d'Exploitation du Trafic Ferroviaire International (SETI); each government held 20 percent of the shares, with 60 percent held through the private Société du Dakar-Bamako (60 percent of capital).

In June 2000, a new Senegalese government suspended the process as it supported a full concession of the line instead of the former plan only to privatize the train operations. The Malian government

[14] Although some sources claim 25 years; the 15 years may be the base period , with options for extension.
[15] Other estimates are up to $40 million.
[16] This is undoubtedly linked to the general decline in South African coal exports to Asia, where it lost nearly 70 percent of its market, mostly to China.
[17] And certainly not in November 2004.
[18] This road will be constructed in 2006.

eventually agreed to the new plan and in February 2003, after a prolonged concession process, a French-Canadian group, Canac-Getma, was awarded the concession for the system for $16 million for 25 years, renewable every 10 years. It will also invest a further FCA 9.5 billion (about US$ 19 million) over a 5 year period to improve infrastructure and a further FCFA 10.5 billion (i.e. about USD 21 million) in rolling stock. The business plan aims to increase international freight traffic from the pre-concessioning level of about 200-250,000 tonnes to over 700,000 tonnes by 2008. In its first full month, October 2003, it doubled the traffic of the previous year, although part of this must have been due to the simultaneous closure of Abidjan port. During the first eight months of 2004, it carried an estimated 335,000 tonnes for about 420 million ntk.

The concessionaire agreed to re-employ at least 1500 persons of the 2600 staff in the two systems[19] and the concession began in September 2003, with 1526 staff. The concession has been accompanied by a US$47 million loan, mostly from the World Bank and the West African Development Bank, with smaller bilateral contributions from France and Canada.

**Table 3-4. Key Performance Indicators – Dakar-Bamako**.

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|
| Tonnes (000) | | | | | | | |
| RCFS | | | | | | | |
| RCFM | | | | | | | |
| Transrail | | | | | | | 480(1) |
| Incl. international | 437 | 386 | 373 | 274 | | | |
| Ntk (mill) | | | | | | | |
| RCFS | 435 | 401 | | | | | |
| RCFM | | | | | | | |
| Transrail | | | | | | | 420(1) |
| Incl. international | | | | | | | |
| Passenger (000) | | | | | | | |
| RCFS | | | | | | | |
| RCFM | | 778 | 682 | 649 | 551 | | |
| Incl. international | | 58 | 50 | 51 | 56 | | |
| Pax-km (mill) | | | | | | | |
| RCFS | 63 | 71 | | | | | |
| RCFM | | | | | | | |
| Incl. international | | | | | | | |
| Employees | | | | | | | |
| RCFS | 1587 | 1525 | | | | | |
| RCFM | | | | | | | |
| Transrail | | | | | | | 1526 |
| 000TU/employee | | | | | | | |
| RCFS | 314 | 310 | | | | | |
| RCFM | | | | | | | |
| Transrail | | | | | | | 275(1) |
| Locos | | | | | | | 43(2) |
| Wagons | | | | | | | 771 |
| Pax cars | | | | | | | 151 |
| | | | | | | | |
| Route-km | 1230 | 1230 | 1230 | 1230 | 1230 | 1230 | 1230 |

*Source. Various: (1) Based on extrapolation of first eight months traffic. (2) 27 line-haul and 16 shunters, of 11 different makes and models.*

[19] About 500 employees in Senegal and 650 in Mali were retrenched.

There is clearly some way to go in improving services. In early 2005, the international passenger service had been reduced to one service per week, with a transit time of 46 hours; it averaged 20 km/hr in Mali and 30 km/hr in Senegal. In May 2004, forwarders were advertising transit times of 17 days between Dakar and Bamako and only 8 days from Abidjan to Bamako. In 2000, about 76 percent of Mali's traffic was transiting through Abidjan, with only 20 percent through Dakar; even in 2003, with Abidjan unavailable for much of the year, Dakar only attracted about 25 percent of the traffic, with Lome and Tema taking most of the traffic lost by Abidjan.

Following the transfer, funds from donors became available about one year later than expected and almost no investment was carried out in 2004, other than emergency works on track and locomotives performed with bilateral funds; little improvement in performance can thus be expected before 2006, although the concessionaire claims that its performance has already improved compared to before the concession. The concessionaire decided to operate reduced commercial passenger services (international train between Dakar and Bamako, express train between Bamako and Kayes) because they are unprofitable and immobilized locomotives required for freight traffic. The concessionaire also refused to operate the public service obligations that were included in the concession agreement (local services stopping at all villages between Bamako and Kayes) because of the poor condition of the passenger cars and the cost of the insurance (about US$2 million). It was agreed that the former public railway company (RCFM) would keep the legal responsibility for these services which would be operated by the concessionaire on behalf of RCFM and the two governments are currently seeking financing for second-hand passenger cars that the concessionaire will find safe enough to operate.

### 3.11 Madagascar

The rail system in Madagascar suffered from severe lack of maintenance over many years and by the 1990's was only just operational. In 2000, it was badly affected by cyclone damage, further affecting services. Studies into privatization had begun in 1996 and, in October 2002, the northern half of the network (the "Reseau Nord" or RNCFM) was concessioned to Madarail. Madarail formally took over at the start of July 2003. The concession is for 25 years; the track remains the government property whilst the rolling stock is owned by Madarail. The Madarail shareholders are Madarail Holdings (51 percent), of which Comazar owns 51 percent, various local investors and the Madagascan government (25 percent).

The network of over 732 km consists of three main lines, from the port of Toamasina inland to Antananarivo (373 km) , from Antanarivo to Antsirabe (169 km) and from Moramanga to Lake Alaotra (168 km) and one branch line, from Vohidiala to Morarano (19 km), which is the railhead for the chrome ore. Because of the extensive rehabilitation required, the concession has been accompanied by an investment program of €37.5 million, including loans from the World Bank (€ 21 million for infrastructure) and EIB (€ 11 million for locomotives) and a € 2 million grant for environmental works.

In July 2003 Madarail had only one locomotive operational but by May 2004 had purchased an additional 7 main line locomotives and had a further 4 locomotives in operation. It has a fleet of about 100 wagons, including 20 container flats.

Madarail initially reopened the main line between Toamasina and Antananarivo, followed by the line to Antsirabe, closed since 2000. Its main traffics were petroleum (for which it is reported to have 20 percent of the market) and chrome ore from the Andriamena mine, for which it carries 100 percent of the output in a road/rail operation. The port is currently being concessioned and a bonded container terminal near Antananarivo is due to be completed in 2006, providing the opportunity for inland container services.

Under the concession agreement, Madarail is to be compensated for any losses it incurs in operating passenger services but, although there have been reports of possible services, none have yet begun. Madarail took over about 800 of the 1800 staff employed by RNCFM and has expanded slightly to nearly 900.

**Table 3-5. Key Performance Indicators – Madarail.**

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003(1) | 2004 |
|---|---|---|---|---|---|---|---|
| Tonnes | | 213 | 141 | 106 | 86 | 63 | 182 |
| Ntk | | | | | | 13 | 62 |
| Passengers | | | 84 | 56 | | - | - |
| Pax-km | | | | | | - | - |
| Revenue (€ 000) | | | | | | | |
| Freight | | | | | | 704 | 2,298 |
| Passengers | | | | | | | |
| Other | | | | | | 43 | 142 |
| Total | | | | | | 747 | 2,441 |
| | | | | | | | |
| Employees | | | | | 1800 | 861 | 897 |
| 000TU/staff | | | | | | 30 | 69 |
| | | | | | | | |
| Locos | | | | | | 7 | 12 |
| Wagons | | | | | | 104 | 152 |
| Coaches | | | | | | 1 | 1 |
| | | | | | | | |
| Track-km | | | | 732 | | 500 | 500 |

*Source. Madarail and various. (1) Six months only.*

Even with the highly concessional financing which Madarail enjoys (the loans are on-lent by the government at low margins and the effective interest paid by Madarail is probably no more than 2 percent) and the grace periods of at least 5 years before debt repayment must be made, the operation appears highly fragile. Average revenue is €0.036/ ntkm, low by African standards, and the total revenue of € 2.3 million is small for an operational network of 500 km in difficult terrain. This was confirmed in May 2005 when Madarail was reported as stating it had made a loss in 2004 and, with three locomotives idle for lack of required funds to purchase spare parts, required additional funding in order to implement its investment plan.

### 3.12 Zambia

The Zambian Railways (ZR) consists of a north-south main-line, linking with Zimbabwe at Victoria Falls in the south and with DRC at Sakania in the north. The Tazara line to Dar-es-Salaam joins at Kapiri Mposhi, and is dependent on ZR to collect and distribute its traffic to its customers some 200 km north on the Copperbelt. The system serves two main purposes: carrying imports and exports, overwhelmingly to and from the south, and hauling mineral-related traffic within the Copperbelt, some of it with very short hauls.

The standard of both the infrastructure and the assets had steadily deteriorated over many years and for several years before the concession it had expatriate senior management under contract. During this period, it also received a loan from IBRD, which had been used to help upgrade the track with concrete sleepers[20] and to rehabilitate four locomotives. Immediately prior to the concession, the railway was handling about 1.8 million tonnes of freight and 400,000 passengers. About 30 percent of the freight by tonnage was local traffic moving between industrial plants within the Copperbelt.

In December 2003, operation of most of the Zambian Railway Corporation network (excluding the Mulobezi branch) was handed over to Railway Systems of Zambia (RSZ), a company controlled by New Limpopo Bridge Projects Investments (NLPI), the parent company of that operating the Beitbridge – Bulawayo line, but also partially owned by Spoornet. Actual management was undertaken by Spoornet under contract to RSZ; RSZ, the concessionaire, is understood to have about 60 staff, responsible for marketing, revenue collection and concession management. Spoornet is the operator, and is reported to employ 705 staff, compared to about 1400 ZR staff immediately prior to

[20] By concessioning, nearly 60 percent of the track had been reconstructed with concrete sleepers.

concessioning, although they have also outsourced a number of maintenance activities. It is also understood Spoornet agreed (at least initially) a contract in which they are paid on the basis of a fixed rate per net tonne-kilometer basis. Given that the infrastructure-related costs are largely independent of traffic volumes, and must be covered whatever the tonnage carried, they are thus carrying a considerable traffic risk over which they have little direct influence.

Two separate concessions were negotiated, one for freight of 20 years, extendable to 30 years, and one for passenger of seven years. The terms of the concession are understood to be highly dependent on traffic volumes:

- for freight transport, an entry fee of $0.75 million together with 5 percent of gross railway income. There was also a fixed fee which depends on a threshold profit being achieved; on reaching this threshold, half the additional profit is paid as a fee; this was the basis of the very large price (about $250 million) reported in the press at the time, and
- for passenger transport, RSZ agreed to progressively increase the minimum service frequency on the mainline from 3 to 7 trips per week, in return for which they are entitled to reduce the fixed fee (assuming this was being paid) by an amount increasing from $0.7 million p.a. at the start of the concession to $1.3 million after about 3 years.

In addition, RSZ agreed to invest $14.8 million in the freight business over five years and about $0.5 million in the passenger business over four years;

During the time between the concession being awarded and the time the concessionaire took over, one of the main potential new sources of traffic, the development of the Konkola Deep mine in the Copperbelt was cancelled. This directly impacted the freight forecasts underpinning the threshold profit in the concession agreement and it now seems unlikely that they will be achieved.

During 2004, the concession was marked by generally poor relations between RSZ and Zambia Railways Limited (ZRL), the government asset manager, due to differences in interpretation of the concession agreement. Although concession payments were made, little or no reporting on either traffic and revenue or asset condition was made by ZRS. In December 2004, a conference was convened between RSZ, ZRL and government officials to review the concession and resolve these issues. The key issues centered on non-achievement of the first year investment plan, with the 10 percent of track under temporary speed restriction at concessioning increasing to approximately 20 percent, and perceived deferral of periodic maintenance. The ZRS general response was that the railway had been in very poor condition when they took it over and that the situation had to be stabilized before it could be improved.

The monitoring process itself was a particular problem, as RSZ refused to accept ZRL as the Monitoring Agent; as a result no information concerning either management accounts or operating and revenue statistics were supplied to the government, in spite of the concession agreement requiring this on a quarterly basis. Nevertheless, regular concession payments had been made, quarterly in arrears, although the government had no way to check their compliance with the concession agreement.

There is similarly little information available on traffic volumes.[21] Traffic levels have generally gone down in tonnage terms but are apparently higher in terms of net tonne-kilometers, with the average haul reportedly increasing by nearly 50 percent as RSZ concentrate on the long-haul traffic to the south rather than the local inter-mine movements (this general tendency has been confirmed by one of the main customers). For passenger transport, three round trips per week were initially achieved between Livingstone and Kitwe, as required by the agreement but the fourth required from mid-2004 has never operated. However, some new and improved passenger coaches have been introduced and passenger fares were held constant.

By the end of 2004, ZRS claimed to have paid nearly $2 million to the government in concession fees, $750,000 as the entry fee and the remainder as quarterly fees related to turnover.

[21] This is still the case in June 2005.

This concession is only in its early days but a pattern is already beginning to emerge in which RSZ feeds as much traffic as possible to the south, thereby maximizing the distance traveled over its own, and related, networks. It will be interesting to observe how much information is provided to ZRL; the concession agreement is understood to have many reporting requirements and conditions that need to be monitored but to date it is understood almost no information has been made available by RSZ. No information is available on traffic levels but rates are reported to have increased. Staff levels have reduced sharply but this may be due to budgetary pressures as much as inherent productivity gains; certainly there have been many claims that the railway is under-maintained as a result.

### 3.13 Mozambique (Beira)

This concession covers the 317 km Mozambican section of the Zimbabwe–Beira route, from the border at Mutare (the "Machipanda line"), together with the 578 km line north towards Malawi and Moatize (the Sena line), where there are large unexploited coal resources, and the Marromeu (88 km) and Vila Nova Frontera (39 km) branches. In August 2004, a concession was signed with Companhia dos Caminhos de Ferro de Beira (CCFB), comprising RITES and IRCON (Indian Railways Construction Corporation) of India (51 percent) and CFM (49 percent, of which 16 percent is held by CFM for subsequent disposal to Mozambican investors) to rehabilitate and operate the lines for a 25 year period.

The Machipanda line, which was for many years the main route for Zimbabwe's overseas trade, and which for much of its distance runs parallel to the oil pipeline from Beira to Zimbabwe, continued to operate throughout the civil war in Mozambique but the Sena line was closed in 1983 from war damage and has never reopened. Besides repairing the war damage, the track will be re-laid with 45 kg rail on concrete sleepers, sufficient to operate 18 tonne axle-loads at 60 km/hr; this will enable the projected coal tonnage of up to 5 million tonnes p.a. to be handled when it eventuates. The project also includes rehabilitating the bridge across the Zambezi and connecting with the currently-disused southern section of the CEAR concession in Malawi.

The cost of the rehabilitation is substantial (Table 3-6) and must be completed within four years of the concession becoming effective.

**Table 3-6. Planned Investment for Beira Concession ($US million).**

| Item | Machipanda | Sena | Total |
|---|---|---|---|
| Infrastructure | 8.0 | 119.3 | 127.3 |
| Rollingstock | 17.1 | 8.1 | 25.2 |
| Total | 25.1 | 127.4 | 152.5 |
| Funded by | | | |
| Shareholder funds | N.A. | N.A. | 19.8 |
| IDA | - | 104.5 | 104.5 |
| GOI letter of credit | 8.4 | 14.2 | 22.6 |
| Commercial debt | N.A. | N.A. | 2.8 |
| Cash flow | N.A. | N.A. | 2.8 |
| Total | 25.1 | 127.4 | 152.5 |

The project is supported by $5 million of technical studies and training. The rollingstock investment on the Machipanda line includes $10 million is to purchase it from CFM and $7 million is for workshop equipment and facilities. However, the investment for the Sena line looks rather small to fully rehabilitate and upgrade 704 km, and to obtain sufficient rollingstock to haul 1 million tonnes on the Sena line and 0.9 million on the Machipanda line, and it is likely additional funds will be required to meet the project targets.

The traffic on the Machipanda line in 2003 was 502,000 tonnes, of which 200,000 was cereals imported as emergency drought relief. In 2004, it is reported there were sharp drops in tonnage in the major traffics, possibly related to the lack of maintenance undertaken by CFM during the 18-month concession handover period. Table A2-2 shows that, in recent times there was normally up to 2 million tonnes of transit traffic through Beira for Zimbabwe; a large proportion of the imports is fuel, which travels by pipeline, but many of the exports are bulks and semi-bulks which could be expected to be effectively captive to rail.

There is no requirement for passenger services to be operated on the Machipanda line but two pairs of passenger trains are being operated to Dondo (about 30 km from Beira); when the Sena line becomes operational a passenger service is required there without any subsidy being paid.

The current operating plan of the concessionaire is constrained by the poor condition of the line when he took it over; transit times to Machipanda are currently 15 hours, an average commercial speed of 15 km/hr. The current plan is summarized in Table 3-7

**Table 3-7. Current Operating Plan – Machipanda Line.**

| | |
|---|---|
| Tonnes (000 p.a.) | 500(1) |
| Tonne-km (million per annum) | 150 |
| Passenger (000 per annum) | 200 |
| Passenger-km (million per annum) | 4 |
| Locos | 10 |
| Wagons | 450 |
| Staff | 400 |
| Productivity | |
| Ntkm/loco (mill) | 15 |
| Traffic units/staff (000) | 385 |

Prior to concessioning, in December 2003, CFM had 1148 active staff in the Central Region, of whom 900 were employed in the railway, 134 in the port and 114 in administration. The total staff associated with the railway must therefore have been around 1000 and the staffing following the concessioning has reduced by about 60 percent.

The general cargo and container terminals at the port were concessioned in 1998 for 25 years to Cornelder de Moçambique, in which CFM has a 30 percent shareholding, and their efficiency is clearly a key factor in ensuring good wagon turnaround and reliable service. The Maersk timetable currently shows 10 days from Harare to Beira by rail and 3 days by road, so there is considerable room for improvement. However, in the medium-term this concession will always be only as good as the performance of the neighboring NRZ. NRZ is in considerable trouble at present and, if it is concessioned, will also have a vested interest in maximizing its own haulage, either through South Africa or along the much easier-graded 20-tonne axle-load Limpopo line.

### 3.14 Mozambique (Nacala)

Nacala is the most important port for Malawi, handling approximately 260,000 tons of import and export cargo in a normal year[22] (Table A2-3), about twice the tonnage being shipped via Beira[23], and nearly ten times as much as import-export cargo via Durban. The transport of import-export cargo through Nacala is almost 100 percent by rail as the road connections are not practicable for heavy freight vehicles. In addition to the Malawi traffic, the line also carries local Mozambique traffic; in 2000 and 2001, the latest figures available, the line carried 70-80,000 tonnes from Nacala and 20-40,000 tonnes of local traffic to Nacala. A thrice-weekly mixed trains, carrying passengers and accompanying "parcels" (actually goods for trading) also operates between Nampula and Cuamba. The estimated tonnage on the line at present is about 350,000 tonnes, with a task of about 200 million ntkm.

Corredor de Desenvolvimento do Norte (CDN), a consortium led by CEAR, signed concession agreements for a 15-year concession of both the Nacala railway and Nacala port with CFM in early 2000. The consortium includes: Edlow Resources Limited (Bermuda) and RDC as foreign investors (51 percent), along with Manica (Mozambique), Mozambican private investors and CFM. The CFM shareholding includes a component (initially 16 percent) for subsequent transfer to private investors, leaving them with an eventual share of 33 percent.

This concession links directly with the CEAR operation in Malawi (from Nacala to Malawi) and this should generate significant economies of scale for both concessions. Finalization of the concession was delayed for five years while funding was arranged for rehabilitation of the 77 km stretch of line between Cuamba and the Malawi border at Entre Lagos. This was provided with a US$29.7 million loan by the US Overseas Private Investment Corporation (OPIC) in 2003, which also covered other works in Malawi and at the port. The loan, although guaranteed by the two governments, is on commercial rather than concessional terms, with interest at about 500 points above the base rate.

The concession finally started in January 2005. It covers both the 610 km main line as well as the 262 km Lichinga branch line. Although the condition of the main line inland to Cuamba is good, much of it having been rehabilitated with concessional loans, the remainder to the border and the branch line to Lichinga are both in very poor condition, with speeds limited to 10-20 km/hr.[24] The concession essentially provides operating rights only; no rollingstock was involved in the sale, although CFM have provided about 220 wagons as their equity contribution to the concessionaire. Five locomotives are currently being leased by the concessionaire from CFM; this is optional and can be terminated at any time by the concessionaire on sufficient notice. It is understood the concessionaire is now employing about 250 staff, compared to the 688 operating staff (plus about 100 administrative staff) on the line in December 2003. As much of the traction power will be shared with Malawi (which had in any event being regularly operating as far as Cuamba because of lack of power from CFM), mechanical maintenance will now be undertaken in Malawi by CEAR staff; a joint productivity figure has therefore been estimated for the combined CEAR/CDN concessions (Section 3.5).

The concession payments include a fixed fee and a variable component; the fixed fee is set at $0.5 million for years two to five, after which it increases to $1.5 million until year ten, and $1.5 million thereafter. The variable component is 5 percent to year five, then progressively increasing to 15 percent after year ten.

In 2004, the line carried about 270,000 tonnes, over 80 percent of which was to and from Malawi. In recent years, the Malawi traffic has represented about 30 percent of the total traffic handled through the port of Nacala. The railway effectively carries 100 percent of the Malawi traffic using Nacala, as the road condition is very poor, but its share of the local traffic is relatively small, partly due to limited infrastructure (for example, there are no container handling facilities at Nampula, the main intermediate town). Cross-border traffic not to and from the port is negligible

[22] In 2002, import tonnage was abnormally high because of 70,000 tonnes of drought relief maize, compared to about 10,000 tonnes in a normal year.

[23] The rail distance to Nacala is 995 km to Lilongwe and 806 km to Blantyre. The road distance to Beira is 1,194 km from Lilongwe and 888 km from Blantyre.

[24] The current operating timetable allows 6 hours for the 77 km between Entre Lagos and Cuamba, compared to 13 hours for the 533 km from there to the port.

Early indications are that customers consider the service, particularly on the railway, is much improved since the handover, although there is clearly still a long way to go. On the other hand, operational changes made by the concessionaire, such as conversion to on-train ticket selling and the associated de-manning of wayside stations, have caused some reaction from the Mozambican authorities.

# 4 IMPACT ASSESSMENT

## 4.1 Role of Rail

The role of rail in Africa has changed greatly in the last thirty years and is likely to change just as much in the next thirty. Thirty years ago, many of the railway systems were carrying a high share of their country's traffic, either because competing road transport had poor infrastructure or restrictive regulations, or because rail customers were established businesses who were locked into rail either through physical connections or (if they were parastatals) through policies which directed them towards the use of a fellow parastatal. During the intervening period, both the economies in general, and transport in particular, have become liberalized. Coupled with the general improvement in road infrastructure this has led to much stronger competition and, generally, a significant loss of their market by railways.

Railways in sub-Saharan Africa, as in much of the rest of the world, took a long time to respond to these changes. Very few of them, other than Spoornet, invested significant sums of their own, or their own Government's funds, in rehabilitating and renewing infrastructure. Such investment as there was, other than for purely mineral lines, usually came from bilateral and multilateral donors. As this has typically arrived after the damage was done, and in some cases not at all, the continent is full of railways that can best be described as "walking wounded." Whether they can be patched up by the appropriate investment medicine and a new exercise regime under a concessionaire is a moot point.

In some cases, help never arrived and the railway has collapsed; this has been the fate of Guinea, Sierra Leone, the north-east network in DRC and some of the Angola short lines.

Railways have also suffered severely during the various wars and conflicts that have occurred during this period: much of the Mozambican central and northern systems, Angola, Ethiopia, Eritrea and Ivory Coast have either been damaged or have been unable to operate for long periods, in some cases up to twenty years. Although it is an understandable desire of governments to reinstate such networks, this is often extremely expensive and it is legitimate to question whether the transport solutions of one hundred years ago are still the most economical solution.

Much is often made of the inherent lower cost of rail as compared to road. This is certainly true where minerals have to be transported from a rail-connected mine to a rail-connected port but is not so clear-cut for general freight which has to be picked up and delivered by road. Comparisons between rail and road line haul rates often show rail is much cheaper but if this were a direct measure of the value to the customer why does rail have such a small share in many of these traffics? It is because the line haul rate is only one of many factors which are taken into consideration; the costs of pick-up and delivery need to be considered, as do the service-level factors such as transit time, reliability, and service frequency. For road to play a significant role in the future general freight transport system it must address service level and ensure it is addressing the needs of customers. In too many cases, what rail has historically offered as "transport" has been a totally different product from what the competing road hauler has been offering, and for which road is able to charge a significant premium.

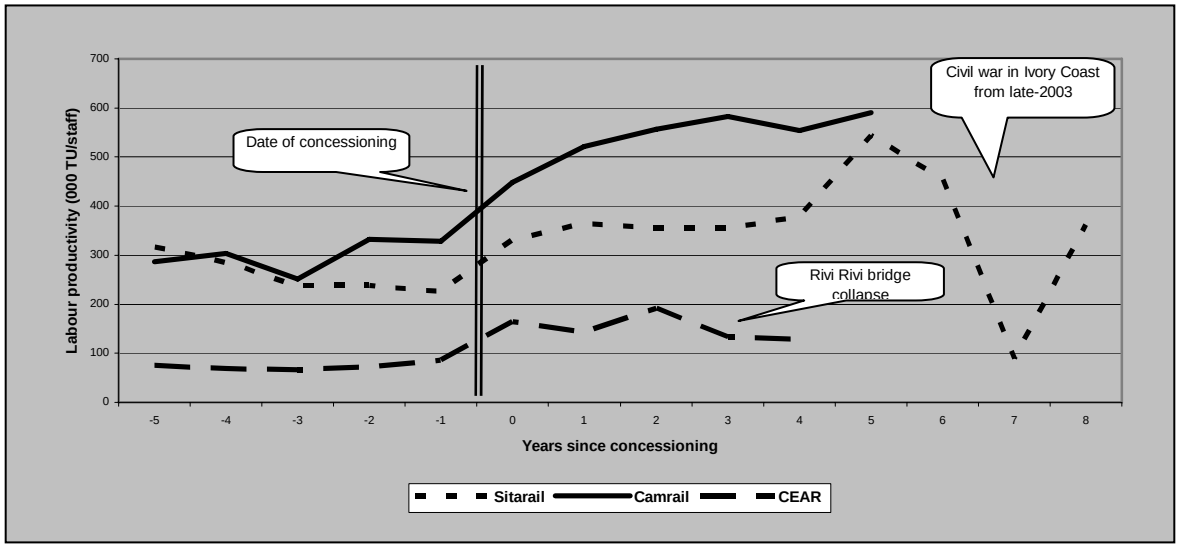
The role of rail has therefore changed significantly in recent times. Within twenty years, any remaining monopolies for general freight will have gone and the only traffics for which African railways, as a mode of transport, will have an undisputed grip will be mineral traffics. However, historically, pure mineral rail transport operations have been run as an internal operation by mining companies and this is likely to be a continuing trend in the future (either through a subsidiary or contract organization). Experience in many countries around the world has repeatedly demonstrated that general freight transport has become an increasingly dynamic business, in which operators need to be flexible, responsive and capable of adapting to changing circumstances. Fewer and fewer customers are fellow parastatals who are effectively directed to use the railway and few government-owned organizations,

no matter how "corporatized" they may be, have the commercial freedom to operate effectively in a fully competitive environment, in which transport services increasingly need to be tailored to the particular requirements of individual customers. If rail is not to die a lingering death, it must adapt to the new market and become a transport business – and the predicaments of the remaining government-owned railways show it cannot compete effectively in doing this whilst it is handicapped by the bureaucratic constraints and lack of commercial incentives and accountability of a government organization.

### 4.2 Productive Efficiency.

Productive efficiency is one area in which the evidence is quite clear. Concession operators, almost without exception, operate their railways with fewer staff and with better asset utilization. The most comprehensive evidence comes from those concessions which have been operating for a few years: Sitarail, Camrail and CEAR. Table 4-1 summarizes three key indicators—(i) traffic units (passenger-km plus net tonne-km) per staff, an indicator of labor productivity; (ii) traffic units per locomotive, and (iii) net tonne-km per wagon—for each of the three for the five years prior to concessioning and the period since. All these indicators have weaknesses as they stand (for example, they take no account of loco or wagon capacity, nor of passenger car occupancy) and can be considerably improved with more detailed data but are sufficient to provide a broad picture.

**Figure 4-1. Labor Productivity Pre- and Post-Concessioning.**




Labor productivity increased steadily in all the concessions. In the case of Sitarail, the service suspensions caused by the civil war in the last 2-3 years have interrupted the improving trend but it can be expected to return to its upward trend when a stable situation returns. Camrail labor productivity increased sharply on concessioning as traffic grew; it then stabilized but now appears to be increasing again. CEAR productivity grew sharply on concessioning when it only re-employed about two-thirds of the previous workforce whilst growing traffic by about 30 percent on an adjusted annual basis. Productivity in the last two years has fallen because of the disruption caused by Rivi Rivi bridge, which left the northern half of the network, and the associated staff, with very little traffic,[25] but the recent takeover of the Nacala line, and the reopening of Rivi Rivi should give a substantial boost to the current figures. Similar figures are likely to come from most of the other recent concessions: Madarail reduced the workforce by 50 percent, both the Mozambique concessions by about 60 percent, the Zambian concession by over 30 percent and the Senegal concession by about 40 percent.

[25] These statistics also demonstrate one of the traps in such broad measures of productivity, as during 2004 the CEAR locomotives did 25 percent of their work on hire to CFM, which is not reflected in the traffic statistics.

**Table 4-1. Key Performance Indicators – Sitarail, Camrail and CEAR.**

| Years since Concessioning | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Labor productivity (000 TU/ staff)** | | | | | | | | | | | | | | |
| Sitarail | 317 | 286 | 237 | 239 | 226 | 331 | 365 | 354 | 354 | 379 | 544 | 454 | 89 | 363 |
| Camrail | 287 | 304 | 251 | 332 | 329 | 449 | 522 | 556 | 583 | 554 | 590 | | | |
| CEAR | 76 | 69 | 67 | 73 | 86 | 164 | 143 | 192 | 133 | 129 | | | | |
| **Loco productivity (mill TU/loco)** | | | | | | | | | | | | | | |
| Sitarail | 14 | 14 | 12 | 12 | 11 | 47 | 51 | 38 | 32 | 32 | 44 | 38 | 7 | 28 |
| Camrail | 18 | 18 | 15 | 20 | 19 | 18 | 20 | 21 | 23 | 20 | 21 | | | |
| CEAR | 2 | - | 5 | 5 | - | 7 | 7 | 8 | 5 | 5 | | | | |
| **Wagon productivity (000 ntkm/wagon)** | | | | | | | | | | | | | | |
| Sitarail | 477 | 458 | 328 | 429 | 420 | 691 | 865 | 841 | 739 | 682 | 886 | 793 | 170 | 601 |
| Camrail | 537 | 582 | 446 | 641 | 629 | 837 | 915 | 889 | 910 | 835 | 864 | | | |
| CEAR | 89 | - | 128 | 130 | - | 169 | 144 | 151 | 86 | 80 | | | | |

Although such reductions feed directly through into the labor productivity figures, they paint a misleadingly gloomy picture of the middle managers of the previous government railways. In many cases key managers remained after concessioning and the high level of surplus labor in the system often reflected not so much management capability as political decisions made in the past to protect employment levels irrespective of railway efficiency. Neither is this a special characteristic of the rail industry; it is common in many parastatal organizations, both in Africa and elsewhere.

Asset productivity has also generally increased. In some cases this reflects greater use being made of assets that were previously lying idle (this is particularly the case with wagons). In others it reflects the previous bureaucratic difficulties in writing-off publicly-owned assets that are surplus to requirements that were left behind by the concessionaire. Nevertheless, whichever asset class is examined, and whether infrastructure or rollingstock, it is achieving better productivity under concessioning than before.[26]

### 4.3 Allocative Efficiency

Quantitative assessment of whether railway privatization or concessioning has contributed to an improved overall allocation of resources is difficult to achieve, particularly when there is only one concession that has operated in an uninterrupted manner for five years. But it is possible to draw some general conclusions.

In broad terms, allocative efficiency reflects whether the right transport flows are moving on the right modes and routes at the right costs. This is best addressed in reverse order.

Are the costs the right costs? The evidence on technical efficiency is that the productivity of the railways after concessioning is significantly improved and there is every reason to think this improvement will continue; the downturns in productivity following the various natural and man-made interruptions to operations are largely because railway employees, who include many specialized staff, have been retained until conditions return to normal. Perhaps just as importantly, concessionaires actively look for and encourage new traffic, thus providing a competitive pressure that has long been absent in certain regions of the continent. Finally, concessionaires normally take a vigorous approach towards dealing with some of the dubious practices that are long engrained in some railways. Railways have traditionally provided many opportunities for employees, whether individually or in groups, to operate “businesses within businesses”; examples range from small-scale theft, such as stealing locomotive fuel or pocketing cash fares on passenger trains to larger-scale operations such as the systematic overlooking of demurrage or, particularly on railways which have an apparent price advantage over road, payments for wagon supply or expedited (i.e. non-delayed) transit. Staff have sometimes been tempted into these practices because of their status as public servants and the associated government controls on wages, and the consequent need to create a remuneration mechanism which can attract and keep qualified staff, but it has often had a corrosive effect on rail operations, particularly those practices which attempt to ration wagon supply.

Concessionaires thus generally have a more appropriate cost structure. This is not to say it is the ideal cost structure; operating cost on railways is a function of capital as well as operating efficiency and many of these railways have been starved of capital where it is required, thus substantially increasing overall operating costs; whilst rail is generally competitive with road over medium-long distances, this is not necessarily so if rail can only operate at 10-15 km/hr. Railways need to be “fit for purpose” if they are to compete effectively; this is not just a function of speed – it does not always require 80 km/hr operation, 40 km/hr is often quite sufficient - but such operation also needs to display the other ingredients of good service quality, particularly reliability and security. Many concessions in Africa, unlike in some other countries, are only undertaken because governments see them as a last-ditch solution; in many cases the railways have been left to deteriorate for far too long and it will be a struggle in many cases to retrieve the situation.

There is finally the issue of road costs. Road operators in Africa, as in may other places, are notorious for overloading with consequent damage to road infrastructure. Road has an articulate and well-organized lobby; counter-arguments from government railways, if they appear at all, have generally been ineffectual and poorly-prepared. Experience has shown concessionaires are unlikely to let this

[26] The CEAR locomotive productivities ignore the scrap locomotives that were purchased for spare parts.

rest and will lobby just as hard for some protection from the more egregious abuses (such as the road truck alleged to be over 100 tonnes gross mass that sank a ferry across the Zambesi in 2003).

Will the traffics be using the right mode? Concessionaires are likely to encourage this merely through doing business in a commercial and business-like manner. There are two aspects: one is pricing the service correctly (by using value-of-service pricing subject to an avoidable cost floor) and the other is ensuring that all the other service attributes are also as competitive as possible. Perhaps surprisingly, concessionaires are often not as prone to use quantitative analytical techniques as their government predecessors may have been; on the other hand they generally have a much simpler organizational structure, having either shed many ancillary enterprises or isolated them from a financial viewpoint, and so perhaps do not need so much. So, in general, they are more likely to get the price approximately right than precisely wrong. They also have, in most concessions, almost total pricing freedom and are thus able to price on a flexible basis and in terms of "value of service" which will inevitably differ from market to market.

In terms of the other attributes, concessionaires are more likely to implement actions that will improve the overall level of service. These range from the physical, such as the proposed construction by Sitarail of an intermodal terminal in Ouagadougou to service the surrounding region, to procedural, such as the introduction by ZRS of company customs bonds to drastically reduce waiting times for import traffic at Victoria Falls. These actions all combine to make rail more competitive in the market place and ensure that its potential advantages are realized in practice. An important factor in many competitive markets is that, increasingly, being a rail operator is not enough; instead the railway needs to provide a transport service, covering the full journey from origin to destination. Conventional railways are poorly equipped to do this, both physically and bureaucratically. They do not have the equipment and find it difficult to be sufficiently operationally and commercially flexible to respond to issues along the whole length of the logistic chain. Concessionaires have the commercial freedom to deal with such issues and it is revealing that worldwide railways are increasingly being operated as just a part of a transport business[27].

The combination of technical efficiency and improved level of service generates particular economic benefits in West Africa; some of the inland countries have bonded warehouses at the ports and transport is then "organized" through a group of accredited transport operators. In the past, these operators have been virtually free to set their own price as the competition from rail has been supply-constrained. The improved technical efficiency automatically expands rail's capacity, thereby bringing direct pressure to bear on the road operators.

In general, therefore, the concessioning of railways will tend to reinforce the choice of the "right mode" by customers.

Will the right traffic be going on the right routes?

This is a little more ambiguous. Where there is a stand-alone railway, the answer should generally be "yes," either because there is only one option or because, as in the example of Malian traffic choosing between Dakar by rail and Abidjan[28] by road (or, if the Sitarail terminal is built, by road/rail), there is a reasonably competitive market and both modes are charging at least their avoidable costs.

The situation becomes more complex when there is a network, as in southern Africa, and one concessionaire controls a key link. A rational concessionaire in Zambia is likely to give traffic from the Copperbelt wishing to travel to Dar-es-Salaam via Tazara (and thus only travel 250 km on his system) far less priority than traffic to Durban, which will travel 850 km on RSZ and a further 1000 km on associated railways. The same is true with traffic from Zimbabwe to and from Beira compared to South Africa (or even Maputo) or, if the connection is ever built, traffic from Blantyre to Nacala compared to Beira. Naturally, shippers still have the road option[29] – in 2002 about 50 percent of copper from the Copperbelt was going by road anyway, principally as back-loaded traffic - but this will

[27] Note Bolloré's classification of their railway business as an "activity connected with transport" or the mining companies, who often relegate their railways to a "surface equipment engineer."
[28] And also shortly between Cotonou by road and Dakar by road.
[29] Or a road/rail option transferring at the other concessionaire's railhead.

definitely not be the cheapest option if it is loaded in a single direction only. However, whether such situations represent allocative efficiency or inefficiency would need to be analyzed on a case-by-case.

An important area associated with allocative efficiency is the long-term future of regional passenger trains. This does not include commuter services, which are appearing in some of the larger cities now (e.g. Dakar and proposed for Accra), and which are likely to have a long-term future in the major centers. However, the longer-distance trains are mostly residual services left over from a more comprehensive network of a previous era when it was train travel or nothing. This is still the case in a few instances e.g. some of the local services and the long-distance services in Tanzania and Mali. A few of these services are still breaking even, (though not including any contribution to eventual renewal of the rollingstock) (e.g. in Tanzania), but where this is so, it is only because of the lack of a reasonable road alternative. In Senegal, the last four hundred kilometers to Dakar can be traveled by bus in half the time of the train and many travelers from Bamako disembark to do just that. Similarly in Tanzania, TRC hardly carries any passengers at all on the area served by roads and, when the road serving Moshi in the north was sealed in the 1990's, the competing passenger rail service was withdrawn within months.

The local trains serving villages with no road connection pose a different problem. In Malawi, the local services are primarily used by traders bringing goods to and from regional centers and the passenger train is really a mixed train with some two or three large open wagons into which the accompanying goods are loaded. This is a highly inefficient way to bring goods to market and, even though the trains are very well loaded, the revenues barely cover 30 percent of the avoidable cost. In some concessions, these services are funded through explicit payments by government but the long-term solution is to create alternative means of transport by developing feeder roads that can provide basic motorized access. This will not only enable far more cost-effective means of goods transport but also greatly improve the general level of accessibility for such locations.

There is no doubt that concessionaires do two things which tend to improve the allocative efficiency associated with passenger transport:

- Firstly, they do not hesitate to draw the government's attention to passenger services that are losing them money and thus raise the issue of more economic alternatives,.
- Secondly, if they must operate them, they generally try to do so in the most efficient way possible, with particular emphasis on revenue collection.

At least two concessions, Zambia and Malawi, have made some improvements to passenger vehicles; the Malawi vehicles are still basic but, compared to the alternative, are regarded as safe and reliable. On such services, everything is relative.

### 4.4 Investment in Rail System

One of the chief characteristics of the African concessions is that they have nearly all been associated with substantial investments principally in infrastructure. But these investments have been financed for the most part by bilateral and multilateral lending agencies. Concessioning has thus been, in most cases, a necessary condition to investment in the sense that much of the finance would not have been made available if governments had not adopted a concessioning policy. Much of the investment has been to catch up with maintenance and renewal backlogs, and without which there would often be no functioning railway. It can thus be characterized as "once-off" investment to get the systems back on their feet.

But are the concessions really self-sustainable in the sense of being sufficient to ensure renewal of assets in the longer-term. – Or will the railways be back, either during the current concessions, or at the end, requiring another shot of investment to prepare them for the next concessionaire?

With the exception of the Beitbridge Railway, which effectively relies on "take-or-pay" clauses, Nacala, which is being funded at semi-commercial rates, and Zambia, where the investment program is modest and being funded directly by the concessionaire, most concessions rely heavily upon the on-lending of loans obtained from international bilateral and multilateral donors such as the World Bank or the European Investment Bank (EIB) at concessional rates. This creates below market borrowing

costs (for example, from about 2 percent for Madarail to 6 percent for Camrail, compared to at least 8-9 percent for CEAR) and lengthy loan tenors and grace periods.

With the exception of Sitarail, rollingstock financing is the responsibility of the concessionaire; loans have been provided in some cases but for many of the low-volume operators the sensible choice is to find second-hand equipment[30].

The investment record so far is patchy. Little has been put into infrastructure to date that has not come from concessional loans although there has been some private investment in rollingstock Even the investment that has been made has often been slow to mobilize e.g. over four years in Cameroon and five years on the Nacala line; this is a long time to wait when a business is barely breaking even. There appear to be two major considerations: firstly, few, if any, of the concessions have been generating the cash flow needed to make such investments from their own resources and, secondly, there is a definite risk-aversion to investing in infrastructure with a life significantly beyond the length of the concession. Even that horizon may be too optimistic; the discussion of the existing concessions shows that even ten years can see the political and economic environment radically changed, leaving the concessionaire high and dry.

### 4.5 Accessibility of the Rail System

The review of concessions yielded almost no examples of where concessioning has led to any services being reduced so that resources could be redeployed to selected users, for example, large corporations or extractive industries shipping in train-load quantities or passengers willing to pay for premium services.

The main example, and even this is anecdotal, is reports that the Comilog mineral trains on the Transgabonais are receiving priority over passenger services. This is not so much a concessioning issue as an access regime issue; it is an inherent risk that occurs when one operator has control over another's services, as is effectively (but only temporarily) the case at present in Gabon, and can only properly be resolved by having a regulator with some teeth to monitor such situations.

The other example which has arisen is in Zambia, where reportedly the concessionaire is concentrating on longer-distance traffic from the Copperbelt to South Africa at the expense of local inter-mine movement of bulk minerals. This presumably reflects a deliberate decision by the concessionaire, who is short of operating rollingstock, to concentrate his assets on those traffics which will be most profitable for him and is thus behaving in an allocatively efficient way[31]. In this case, the mines have the alternative of road transport to shuttle their traffic from plant to plant but, if the right rate could be established, presumably could make a case for ZRS to invest in additional rollingstock to handle their traffic.

### 4.6 Affordability and Possible Impacts on the Poor

The impact of concessioning on the poor can come about in two ways: first, in a direct way, by making personal transport more expensive for them and, secondly, by indirectly making their purchases more expensive and reducing the prices they can achieve for their outputs through increases in freight tariffs. This needs to be balanced against the financial benefits to the government of concessioning, which generally consist of a lump sum at the start of concessioning and a stream of annual lease payments and/or concession fees which in theory can flow through to the population at large and the poor in particular.

There is no evidence that personal travel has been made more expensive for the very poor. In general, the very poor cannot afford to travel at all, and certainly not by train. In some of the railways concessioned, there is no option – it is the train or nothing. This is the case along the Bamako-Keyes line in Mali, for many of the villages along the passenger routes in Malawi and for a few settlements along the route in Zambia. In each of these cases, rail rates and services have been broadly maintained at their pre-concessioning levels to date and, in the case of the latter two, are controlled by the government.

[30] Although this is not always readily available for low-axle-load narrow-gauge lines.
[31] He is also feeding traffic to his associated railways in the south, which may not be quite so efficient.

The impact of concessioning on freight rates is ambiguous. In some cases they have increased but in general, unless it is a monopoly such as fuel, the market share is not sufficiently large for such changes to significantly affect the selling price of commodities. In any case, any such price rises will generally have been accompanied by an improvement in service level, balancing out in terms of total cost to the customer. There are relatively few such cases, apart from bulk minerals such as manganese on the Transgabonais, where there are monopolies for freight[32]; in most cases the opposite is the case and freight rates are effectively set by the competition, either in terms of road or in terms of an alternative port for those routes where rail has a monopoly (such as Beira in the case of the Nacala corridor and Abidjan et al in the case of Transrail).

[32] And even here there is the threat of the alternative rail route through the Congo.

# ANNEX 1: DEVELOPMENT OF RAILWAYS IN SUB-SAHARAN AFRICA

## A1.1 WEST AND CENTRAL AFRICA

The first line in Senegal was constructed inland, but parallel to the coast from Dakar to St. Louis, at the mouth of the Senegal River, in 1885. At about the same time, construction had begun well inland, from Kayes, some 600 km upstream on the Senegal River, a further 450 km inland to Bamako on the Niger; the line took over 20 years to reach Bamako in 1904 with an extremely poor standard of construction. Although this provided a rail-water route to the Atlantic coast, it was longer than the alternative road-rail route via Conakry and struggled to attract traffic. A direct route to Dakar was then planned with a connection between Thies, on the St. Louis line near Dakar, and Kayes. This line, which was also intended as the first stage of a "Transversale" which would link the various colonial lines heading north from various French ports on the Gulf of Guinea, was completed about 1915. The three lines were progressively amalgamated and from 1948 operated as a single entity (Dakar Niger Railway) until independence in 1960. The railway then split into two national railways (RCFM in Mali and RCFS in Senegal, later changed to SNCS) and went through a period of three years during which no international traffic operated. International services were then restarted but offering a poor level of service and, in 1995, under pressure from international agencies, a new organization, OCGTI, was established to operate the line. After a further 8 years of concessioning activity, the new concessionaire, Transrail, took over in September 2003. However, it still faces strong competition for import-export traffic from Abidjan as well as Lome, Tema and Cotonou.

A meter-gauge line was opened from Conakry to Kankan, in inland Guinea close to the Mali and Ivory Coast borders, in 1914; this gradually fell into disrepair and long-distance services ceased about 1987. However, three independent private mineral lines are still operating carrying bauxite from mines to ports, one of which shares part of the public railway right-of-way. In 1997 it was reported that Slovak Railways were rehabilitating 350 km between Conakry and Dabola at a cost of US$200 million but that project appears to have since lapsed. By 2004 it was reported that irregular local services that had operated over rehabilitated track for the first 36 km from Conakry had been suspended and Guinea now appears to be floating the possibility of private involvement in the rehabilitation and reopening of the line.

A 762 mm gauge railway of about 350 km was built between 1899 and 1905 linking Freetown with the eastern part of Sierra Leone. This mainly relied on palm-oil traffic but was shut completely in 1974. An 84 km private mineral line of 1067mm gauge, built to link an iron-ore mine to the port, closed about the same time and there are now no operating railways in the country.

There was never a public rail network in Liberia, but three lines were constructed by iron ore companies to transport iron ore from the now closed iron ore mines at Mano River, Bong Town and Nimba to the ports of Monrovia and Buchanan. The total length is about 490 km., of which 345 km was standard gauge and 145 km was meter gauge. The Nimba line was the last to shut, in 1989 after iron ore production ceased; the other two were shut down by the civil war. The lines were left unattended and are reportedly in extremely poor condition, with large sections dismantled and approximately 60 km of track exported for scrap in 2001. The associated port facilities have been rendered useless.

Construction on the Abidjan-Niger Railroad (Regie du Chemin de Fer Abidjan-Niger-RAN) began in 1905 and continued until 1954. The meter-gauge line extended northward from Abidjan into Burkina Faso and terminated at Ouagadougou. Its total length, including the portion in Burkina Faso, was 1,180 kilometers. Following the opening of the Abidjan port in 1950 and the upgrading and expansion of the road network, RAN became primarily a long-distance hauler. At one time, it carried 90 percent of Burkina Faso's foreign trade and half of the 50 percent of Mali's foreign trade that passed (via Bobo Dioulasso in Burkina Faso) through the seaport of Abidjan. In the 1980s, economic recession, and political instability in Burkina Faso, created financial and administrative problems, deteriorating equipment, and debt, at least in part as Burkina Faso did not pay its bills for five years, with accumulated arrears reaching CFA F17 billion. For political and economic reasons, the two countries

agreed to liquidate the RAN and divide its assets, estimated in 1987 to be CFA F78 billion in rolling stock, railroad stations, buildings, and land. In 1992 the two countries agreed to concession the railway and Sitarail commenced operations in 1995. In 1993 the line was extended a further 105 km past Ouagadougou to Kaya. Traffic grew steadily but the civil war in 2002-3, and again in 2004, severely affected traffic and the railway was closed for several months at a time.

The first railways in Ghana (then known as Gold Coast), opened in 1901, linking the coast at Sekondi (near Takoradi) with the inland mining areas. The network was later extended to provide links to Kumasi from both Takoradi (1903) and Accra (1923), as well as a cross-country link inland and parallel to the coast (eventually completed in 1956) and various branches. The network (of about 950 km) currently largely carries bulk mineral exports. There are plans to reopen the branch from Accra to the port at Tema, as well as construct a direct link from Burkina Faso avoiding Ivory Coast. A concessioning process is currently well-advanced.

Togo was a German colony until the First World War, after which a part was absorbed into Ghana and a part became a French colony. Under German rule, three lines were opened between 1905 and 1911 along the coast to Aneho (44 km), inland to Kpalime (119 km) and due north to Atakpame (160 km). The French subsequently extended the Aneho line along the coast to connect with the Benin network and the Atakpame line north to Blitta. Following independence, the network deteriorated, the Benin connection shut in 1987 and was subsequently dismantled and rail operations were taken over by CANAC in 1995 for five years. Following the departure of CANAC at the end of 1999, the only traffic is clinker between Taligbo and Lome, operated over a private line and some 19 km of the previous main line by WACEM (West African Cement Company, former Cimtogo), to whom the line and operations were transferred in 2002. An Indian consortium led by RITES reportedly received a concession to run the freight trains in 2000 but no details are available. CTMB (Compagnie Togolaise des Mines du Bénin) also continues to operate the private Kpémé – Hahotoé/Kpogemé line in the east of the country, transporting phosphate rock for processing and export from Kpémé.

The Benin network consists of a 438 km meter-gauge main line running inland from Cotonou to Parakou, and two branch lines, a 34-km link westward between Ouidah and Segboroue (and which previously continued to the Togo border) and a 107-km link from Cotonou via Porto Novo to Abomey, near the Nigerian border (in 1999 this was reopened as far as Porto-Novo after nine years of closure). The main line is within the main transport corridor to Niamey, in Niger to the north, and the railways are operated by a joint Benin-Niger organization (OCBN), established in 1959, which is responsible for organizing a joint road/rail transport system between Cotonou and Niger. OCBN faces numerous operational and financial problems and in 2003 was reported to be the subject of a concessioning study.

The basic elements of the 3,505 km 1067mm Nigerian system are two main lines running inland from the coast either side of the Niger delta: one, in the west from Lagos to Kano, opened in stages between 1898 and 1915, and the other, in the east from Port Harcourt to a junction with the western line at Kaduna, opened between 1914 and 1926. Three major extensions were subsequently constructed, to Kaura Namoda in the northwest and Nguru in the northeast, both completed by 1930 and a long branch from the eastern line to Maiduguri, near the Chad border, only completed in 1964, together with some short branches. The system has a diagonal orientation, with few cross-country links, and only connects with two of the country's ports. Since independence in 1960, poor maintenance, inadequate government funding, declining traffic and the effect of the various civil disturbances all contributed to a deterioration of the rail system. In 1978, RITES were awarded a contract to manage and rehabilitate, where possible, the system and this continued until 1982. During the following seven years, there was again a steady deterioration until 1988, when it was declared bankrupt; following the forced redundancy of about 25 percent of the workforce, the remainder then went on strike for six months, closing down the system. An energetic administrator, appointed in 1989, then succeeded in reviving the railway but, on his departure, matters again deteriorated, reaching their nadir in 1993, when only 157,000 tonnes and just over half a million passengers were carried. In 1997, a second rehabilitation program was begun involving rehabilitation of infrastructure and rollingstock by the Chinese. This again succeeded in increasing traffic significantly. In 1992, the steel works at Ajaokuta constructed their own standard-gauge line to their mine at Itape and have since been extending it to its port at Aladja, near Warri. There have also been plans to construct a standard-gauge line from coal mines at Enugu to Lagos, as well as a high-speed train from Abuja to Lagos. At the same time, the Government has undertaken a number of concessioning studies. The

most recent development (May 2005) is another round of rehabilitation, funded by a US$ 3 billion grant from the Chinese, to rehabilitate the infrastructure over a five-year period as a prelude to privatization.

The first line in Cameroon, which was a German colony at the time, was a 43 km narrow-gauge line between Victoria (now Limbe) and Soppo. Construction began in 1906 on the main line inland from Douala, which reached 160 km to the Manenguba Mountains (160 km) by 1910 and then continued to Eseka before the First World War. After the war, the colony became French and they continued the line through Yaounde to Ngaoundere in northern Cameroon. A short branch to Mbalmayo is now shut. Two other lines are also operated: the West Line, from Douala to Nkongsamba (initially opened from Bonabéri to Nkongsamba in 1911) is operated as far as Mbanga, from where a line to Kumba, in the English-speaking region of the country, was opened in 1969. The southern section, which was realigned in 1986, faces substantial competition from road as far as Yaounde, but from there to Ngaoundere road conditions are poor and this, combined with Ngaoundere being a railhead for transit traffic for Chad, has maintained both passenger and freight traffic at a reasonable level. Until 1999, the railway was operated by the state operator, Regifercam, but it was then concessioned to Camrail.

The Gabon railway was initially constructed some 339 km inland from Libreville to Booue between 1974 and 1983. In 1986 it was extended some 345 km to Franceville, serving en route the mining area of Moanda (about 644km from the special-purpose port at Owendo). Most of its traffic is manganese ore (65 percent) and logs (28 percent), together with some general freight and some passengers. The manganese is mined by the 30 percent state-owned Comilog, who had opened their mine in 1962. Until the railway was extended, Comilog transported its product through the Congo, using an aerial ropeway to link with FCO and Pointe Noire. After the railway was constructed, they shared the traffic between the original route and the Gabon railway, operating their own trains. Since then, all output has been on the Gabon line. During this period the line was operated by a state company, OCTRA. In December 1999, the railway was concessioned, being awarded to Transgabonais, a consortium led by the parastatal timber company responsible for most of the log traffic. Comilog had also been a bidder for the concession and there was a continuing dispute about the access charge that should be paid. Eventually, in May 2003, the concession was taken back by the Government and handed to Societe d'Exploitation de Gabonaise (SETRAG), a subsidiary of Comilog, who have operated it for the past two years. It is due to be re-concessioned in July 2005 and SETRAG are currently trying to raise finance to fund a maintenance backlog over the next 5 years quoted as FCFA 51 billion (US$100 million).

In 1923-4, a 221 km line joining Pointe-Noire on the coast of what is now the Congo Republic (or Congo Brazzaville) to Brazzaville, opposite Kinshasa, was opened. This provided independent access to the Atlantic, which previously had required transit through the then Belgian Congo and the Kinshasa-Matadi line. A 286 km branch was subsequently built to Mbinda over which the manganese from Gabon was exported. Operated by the State-owned CFCO, the line has in poor condition and, in recent years, has been subject to considerable damage from the various civil disturbances that have occurred in Congo Brazzaville. In 2003, the Government decided to concession the line; four companies were short-listed (Bollore, RITES, NLPI/Spoornet and Sheltam) of which two (Bollore and Sheltam) were invited to submit detailed proposals. By mid-2005, Sheltam is the only financial bidder but the process is currently on hold.

Long-distance transport within the DRC was historically dominated by river traffic (particularly between Kinshasa and Kisangani) and most railway lines, other than the southern network linked to South Africa and, later, Benguela were either isolated feeder networks or short links avoiding stretches of difficult navigation. The first line constructed was Matadi to Kinshasa (then known as Leopoldville) from 1889 - 1898, to by-pass cataracts on the Congo River; other isolated lines were constructed between 1903 and 1910 on the upper reaches of the Congo (by then called the Lualaba) near Kisangani (then known as Stanleyville) and from Kindu to Kongolo. The southern line from Zambia reached Lubumbashi (then known as Elisabethville) in 1910 and there was continuing construction over the next forty years, so that by the 1950's it was possible to travel from both the Congo and Kasai Rivers, as well as Lake Tanganyika, to South Africa. The 5033 km network consists of four segments:[33]

[33] There are also two urban networks based on Kinshasa (75 km) and Lubumbashi (10 km).

- The 366 km link between Kinshasa and the port of Matadi, the head of sea-going navigation;
- The 125 km link from Kisangani to Ubundu, bypassing cataracts and linking Kisangani to the middle section of the Congo River;
- The 3.516 km (of which 858 km are electrified) 1067 mm gauge network in the south-east;
- A 1,026 km narrow-gauge Uele network in the north linking the mining area of Kilomoto to the Congo River.

These were originally separate companies, but in 1974 they were nationalized and combined to form a single State-owned operator SNCZ. In April 1991, the railways were reorganized, and the Matadi line given to Onatra, the national transport organization also responsible for the ports and river transport. In November 1995, operation of the railways was transferred through an agreement to Sizarail; however, this lasted under two years before being terminated by the Congolese Government. Operations are now under the control of SNCC; however, it is understood there is substantial South African involvement, both in terms of staff and rollingstock, in the current operation of the southern network.

There are three separate systems in Angola, one of which, the Benguela Railway, is physically connected to the Southern Africa system through southern DRC. All were badly affected by the war that began in 1975, although some have begun operating again to a greater or lesser degree; the reported situation in 2004 is summarized below.

In November 2001, the concession of the 1347 km Benguela Railway expired and the railway reverted to the State. Services and rollingstock were rehabilitated and in 2004 SITLOB (the Lobito-Benguela Interurban Passenger System) invested $US 150million. In October 2004, the railway was running services 120 km between Lobito and Cainbambo and also over an 83 km stretch of line centered on Huambo, some 420 km inland. A $2 billion loan was reportedly under discussion with China to fund rehabilitation of the remaining stretches.

In January 2004, the 423 km Luanda railway was running services from Luanda to Dondo, 190 km inland. Two narrow-gauge railways, from Canhoca to Golunga Alto (a 31 km branch off the main line) and the physically separate line running inland from Porto Amboim to Gabela (123 km) remained closed

In January 2004, the 900 km Namibe (formerly Mocamedes) railway was running inland as far as Matala (425 km) but the remainder of the line, to Menogue, remained closed. RITES has been awarded a $40 million contract to rehabilitate the railway, funded by a loan from the Exim Bank of India.

### A1.2 SOUTHERN AFRICA

The first lines in South Africa were private lines built a short distance inland from Cape Town and Durban. These were then taken over by the (then) state governments and extended, with the Transvaal network being constructed in the years following the development of the gold fields in the 1880's. The South African network developed through the early twentieth century to become by far the largest in Africa, and one of the major systems of the world. It is now operated by Spoornet, a division of Transnet, which also controls the South African ports through its subsidiary Portnet. Spoornet is active in consultancy and equipment leasing in both Africa and South America, is a shareholder in Comazar, which is involved in the concessions in Sitarail, Camrail and (previously) Madarail and is also the operator for the concessionaire in Beitbridge Railway (BBR) and in Zambia.

Curiously, in spite of its extensive domestic network, South Africa only had a single route to the north for many years, to Zimbabwe (then known as Rhodesia), via Mafeking and Bulawayo. This line, the first stage of the planned Cape-to-Cairo Railway, was built privately in 1899 by what became the Rhodesia Railways Company. This company survived until 1947, when most of its lines and rollingstock were purchased by the then Southern Rhodesia government. Gradually, the sections of line in other countries were relinquished, with 112 miles in South Africa being transferred in 1959 into Spoornet and the Botswana section in 1987 to form Botswana Railways. This railway continued to

carry a substantial volume of transit traffic, particularly to and from Zambia, until the opening of the BBR in 1999.

The link to Cape Town provided the second link to the sea for Zimbabwe. The other was the line from Beira to Harare (then known as Salisbury) via the border at Mutare (then Umtali).This route, and the companion port at Beira, were operated under 50-year concessions which expired in 1949. At that time, the line was returned to the Mozambican colonial government, becoming part of CFM. It has now been re-concessioned as described in Section 3.13. However, this route is steeply graded, and the port has limited draught, and in 1955 additional capacity was created through an additional link to the sea with the construction of a line with much easier grades to Maputo (then Lourenco Marques). As traffic with South Africa continued to increase, a second link to South Africa. This provided an indirect connection to the South African system but a direct route to the industrial heartland of South Africa surrounding Johannesburg capacity was provided in 1975 with a line from the Lourenco Marques line at Rutenga to the Spoornet system at Beitbridge. At the time there was considerable discussion as to whether the connection would be better made to Bulawayo via the West Nicholson branch, providing a much more direct route to Zambia and DRC, and this route subsequently resurfaced as the Beitbridge Railway BOT scheme in 1999.

Rhodesia Railways continued to construct north in the first decade of the last century, until they reached the Zambian copper mines and the Congo border in 1909. The network was then continued north to the Katangan copper mines at Lubumbashi (then Elisabethville) and, over the next twenty years, extended some 1600 km further north to Port Francqui on the Kasai River, where traffic was transshipped. The Copperbelt got a direct (and much shorter, by about 800 km) outlet to the Atlantic in 1931, when a link was constructed to the Benguela Railway, whose construction from the coast had begun some 35 years earlier. Until this line closed with the advent of the war in Angola, it was the only east-west rail route across Africa north of South Africa. The main Zambian system was concessioned in 2003 and the Congo network was operated as the short-lived Sizarail concession in 1995-1997.

The introduction of sanctions on Southern Rhodesia created the need for an alternative rail outlet to the north for Zambia. This was achieved with the construction of the 1860 km Tazara line in 1975, from Kapiri Mposhi in Zambia to Dar-es-Salaam in Tanzania. This line is jointly owned by the Zambian and Tanzanian governments and, although well-engineered through some difficult terrain, has never carried a substantial volume of traffic; it is currently in the process of being concessioned.

The network in Namibia was originally constructed by the German colonial government around 1900, with a 400 km line inland from Swakopmund to Windhoek. This was extended with some branches and a loop made to also connect with the port of Luderitz in the south. The connection with the South African network was made in 1915 during the war and from then until independence in 1990, the network operated as an integral part of the South African network. For the last fifteen years, it has again been part of Transnamib Limited, a multi-modal transport operator.

The first line in Mozambique was the link from the Transvaal to Lourenco Marques, followed by the Beira line. A branch from the Beira line at Dondo (with running rights into Beira), was built by the private Trans-Zambesia Railway in 1922 to the Zambezi at Sena to provide access to Malawi (then Nyasaland) and then extended north-east along the Zambezi towards Moatize. Four other isolated lines were also constructed inland from ports at Nacala, Quelimane, Inhambane and Xai-Xai. All these lines were affected to a greater or lesser degree during the civil war and the Inhambane and Xai-Xai lines remain closed. The lines and the associated ports are all owned by CFM, which has set out to rebuild the rail and port transport system. It is doing this by concessioning wherever possible, generally taking about a 30 percent share in the concession vehicle. To date, it has concessions in place for the ports at Beira, Maputo and Nacala, although it retains control of a number of bulk terminals, and the Beira and Nacala rail lines. A concession which involved upgrading the Ressano Garcia line from South Africa was awarded in 2002 to NLPI and Spoornet but has not been made effective to date.

The first railway in Malawi was constructed in 1908, linking the main commercial centre, Blantyre, with a port on the Shire River. This was extended by 1915 to the Zambezi and finally in 1935 the Zambezi was bridged and through rail connection to the south established. The link to the Nacala line was constructed in 1970 and a branch west towards Zambia in 1979-81. The original line became

inoperable during the Mozambique civil war, when the Zambezi bridge was destroyed, and fell into further disrepair when a major bridge over the Shire River was washed away in the 1990s. The network was concessioned in 1999 to Central East African Railway, the same concessionaire as for the Nacala line on the other side of the border.

All the above railways are built to a common gauge (1067 mm or Cape Gauge), even though a number of them were originally built either as narrow-gauge, meter-gauge or standard-gauge lines, and rollingstock could, and to a large extent still does, move in significant quantities between systems.

### A1.3 EAST AFRICA

The backbone of the rail network in East Africa was what was at first known as the Uganda Railway, opened in 1902 from Mombasa to Kisumu on Lake Victoria, with steamer connections from there, initially to Entebbe but subsequently extended to several ports on the lake, including some in Tanzania (then German East Africa). At the time, there was very limited development in Kenya (Nairobi did not exist prior to the railway arriving) and the railway was constructed in large part for political purposes. Branches and, in Uganda, feeders to ports on Lake Victoria, were progressively added, one of the more important being the Magadi line serving the soda-ash deposits, and a direct rail route to Kampala was completed via Jinja in 1931. Development of the network continued after the into the 1950's, with the last major line being the Western and Northern Uganda lines, to Kasese in 1956 and Pakwach on the Albert Nile in 1964. Many of these lines only generated limited traffic and have since been closed.

The system in Tanzania was initially constructed by the Germans, with a line inland from Tanga in 1896, thus pre-dating the Uganda Railway; this was subsequently also linked to the main Uganda railway. The main line from Dar-es-Salaam was constructed to Lake Tanganyika by 1914 and a number of branch lines built over the next 50 years, the most important of which is to Mwanza on Lake Victoria, providing a competing route for Uganda traffic as well as cutting off traffic that had previously moved through Mombasa. The two Tanzanian systems were connected in 1961, thus providing a through route of sorts between Dar-es-Salaam and Nairobi and a short-lived line (with a life of only eight years) was constructed inland from the southern port of Mtwara as part of the ill-fated groundnuts scheme. The Tanzanian network is the main outlet for Burundi traffic but most Rwanda traffic is carried through the northern corridor. Both systems have carried some DRC traffic from time to time.

The Kenya and Uganda Railway had always included Mombasa and the lake ports within its operations and in 1948, it was combined with the Tanganyika Railways and Ports Services to form the East African Railways and Harbours, a single organization responsible for the railways in all three countries. This survived until it was dissolved in 1977, when separate railway corporations were established for each of the three countries; all three are now well-advanced in the concessioning process, with awards planned by the end of 2005. All three railways are meter-gauge and any through traffic from Tazara (mostly carried by an independent operator) is thus transshipped.

The 779 km Djibouti-Ethiopian railway was constructed in 1896 as a concession from the then French-controlled port of Djibouti to Addis Adaba. The original concessionaires only reached Dire Dawa by 1902 before they went bankrupt and a second concession was awarded, this time to the Emperor's French doctor. The railway operated until 1977/78, when it was closed and damaged during the Ogaden war. It is currently operated by CDE, jointly-owned by the governments of Ethiopia and Djibouti, but is poor condition and requires substantial rehabilitation. It is currently in the process of being concessioned, under a project funded by the EU.

The 950 mm Eritrean Railway was constructed from 1888 on by the then Italian colonial administration and ran inland from the Red Sea port of Massawa, initially as far as Ghinda, but subsequently to Asmara and then Agordat, about half-way to the Sudan border. It was very steeply graded, climbing 2400 meters, mostly at a grade of 3.3 percent.. During the Second World War, the line was cut back to Agordat and was subsequently dismantled in the 1970s. The line is currently being reconstructed by the Eritrean government and both regular and tourist trains are reported to have operated over various stretches of the line.

The 4800 km main[34] system in Sudan is 1067 mm gauge and is operated by the government-owned Sudan Railways Corporation. The early lines were linked to military operations, heading south from the Nile at Wadi Halfa. The line proved uneconomic for commercial traffic and in 1906 a direct connection between Khartoum and the sea was established via a new line from Atbara to a new port at Port Sudan. Branches were extended shortly after to El Obeid and Kuraymah and in the 1920s, a direct link to the port was established from Sennar via Kassala. Finally, in the 1950's, the western lines were extended to Nyala and Wau (1959). The condition of the railways steadily deteriorated, part of the Wau line has reportedly been lifted and train services have been reduced to very low frequencies. There has reportedly been some "concessioning" of specific activities to the employees, including catering services and one of the main passenger services, but no suggestion of the transfer of the railway as a whole to a concessionaire.

[34] A second, the 700 km Gezira Light Railway, serviced the farm areas of Gezira Scheme and its Manaqil Extension, delivering supplies and carrying cotton to ginneries.

# ANNEX 2: TRANSIT TRAFFIC THROUGH MOZAMBICAN PORTS

The port statistics in this annex are included to indicate the volume of traffic available to the various rail concessions running inland from the Mozambique ports. Differences between the port figures and the volumes carried by the railways are due to traffic carried by other modes (road in the case of Maputo and road and pipeline in the case of Beira) and also by discrepancies 9e.g. Nacala in 2004, where the port statistics are 20% below the rail statistics).

**Table A2-1. Transit traffic through Maputo Port by Country (000 tonnes).**

| | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|
| **Imports** | 0.0 | 0.0 | 97.4 | 37.2 | 274.0 |
| South Africa | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Zimbabwe | 0.0 | 0.0 | 92.6 | 31.8 | 274.0 |
| Others | 0.0 | 0.0 | 4.8 | 5.4 | 0.0 |
| **Exports** | 1663.2 | 1923.6 | 1702.0 | 2025.6 | 2260.0 |
| South Africa | 1179.0 | 1530,9 | 1266.3 | 1575.7 | 1770.0 |
| Swaziland | 326.6 | 212,4 | 225.8 | 214.5 | 220.0 |
| Zimbabwe | 157.6 | 179,5 | 214.9 | 235.4 | 270.0 |
| Others | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 |
| **Total transit** | **1663.2** | **1923.6** | **1799.6** | **2062.8** | **2534.0** |

*Source. CFM and various; 2004 estimated.*

Excludes container traffic. However, container transit traffic in containers was only recorded during the period in 2004 according to the statistics, with 6,200 TEU. The Zimbabwe import tonnage in 2004 was grain.

**Table A2-2. Transit Traffic through Beira Port by Country (000 tonnes).**

| | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|
| **Imports** | 1581 | 1485 | 1363 | 1132 | 1069 |
| Zimbabwe | 1469 | 1392 | 1306 | 1089 | 977 |
| Malawi | 91 | 74 | 44 | 41 | 87 |
| Zambia & Others | 21 | 19 | 14 | 3 | 4 |
| **Exports** | 645 | 329 | 321 | 506 | 599 |
| Zimbabwe | 519 | 215 | 209 | 406 | 541 |
| Malawi | 81 | 83 | 60 | 92 | 25 |
| Zambia & Others | 46 | 32 | 52 | 8 | 34 |
| **Total transit** | 2227 | 1814 | 1684 | 1638 | 1668 |
| Percent of total traffic | 85 | 79 | 79 | 75 | 71 |
| of which container traffic (in TEU) | | | | | |
| Import | 10326 | 9327 | 4693 | 3305 | 3802 |
| Export | 17551 | 15981 | 16620 | 14322 | 12823 |
| Percent of total containers | 74 | 70 | 65 | 51 | 55 |

*Source. CFM and various; 2004 estimated.*

By 2004, the port statistics show transit container traffic had reached 24,900 TEU, of which 13,500 TEU were imports. 75,000 tonnes of containerised cargo was imported by Malawi and 99,000 tonnes exported. Corresponding figures for Zimbabwe were 26,000 tonnes of exports and 46,000 tonnes of imports. In addition, non-containerised transit traffic in 2004 is reported as 635,000 tonnes to and from Zimbabwe and 488,000 tonnes to and from Malawi, of which 353,000 tonnes was fuel, 56,000 tonnes was fertiliser and 77,000 tonnes was sugar.

**Table A2-3. Transit Traffic through Nacala (000 tonnes).**

| | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|
| Imports | 82,4 | 87,9 | 230,7 | 152,1 | 156,8 |
| Exports | 15,9 | 28,2 | 25,0 | 68,7 | 117,8 |
| Total transit | 98,3 | 116,1 | 255,7 | 220,8 | 274,6 |
| Of which containers (TEU's) | | | | | |
| Import | 889 | 1375 | 2113 | 4446 | 4168 |
| Export | 649 | 1909 | 4436 | 4055 | 5140 |
| **Total TEU** | **10725** | **14772** | **19493** | **25207** | **26709** |

*Source. CFM and various; 2004 estimated.*

Almost all transit traffic through Nacala is for Malawi. Port statistics for 2004 give 186,000 tonnes of transit traffic for Malawi, compared to the rail statistics of 223,000 tonnes.

**Table A2-4. Malawi's Imports and Exports via SADC Ports, 2000-02 (000 tons).**

| Port | Imports | | | Exports | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2001 | 2002 | 2000 | 2001 | 2002 | 2000 | 2001 | 2002 |
| Nacala | 152 | 130 | 182 | 69 | 118 | 90 | 221 | 248 | 272 |
| Beira | 38 | 51 | 60(2) | 92 | 25 | 40(2) | 130 | 76 | 100(2) |
| Durban | 15 | 11 | -1 | 19 | 11 | -1 | 33 | 22 | -1 |
| Dar es Salaam | 5 | 0 | -1 | 0 | -1 | -1 | 5 | -1 | -1 |

*Source. SATCC-TU & NPA:SA ; NB Appears to exclude oil imported through Dar-es-Salaam.*

*(1) Not available.*
*(2) Estimate.*

By 2004, imports through Beira had increased to 484,000 tonnes (see Table A2-2) with 176,000 tonnes of exports. Traffic through Nacala is reported to have reduced to 223,000 tonnes.

# GLOSSARY AND ABBREVIATIONS

| | |
|---|---|
| Affermage | Type of concession contract in which the operator leases the sector assets from the public authority, which remains responsible for major investment |
| BBR | Beit Bridge Railway: BOT concessionaire in Zimbabwe |
| BOT | Build-Operate-Transfer: one of the common forms of concession, with the transfer normally occurring after operation for, say, 30 -50 years |
| CANAC | Formerly the consulting arm of Canadian National railways: now the main concessionaire for Senegal-Mali |
| CDN | Corredor de Desenvolvimento do Norte: concessionaire of Nacala line |
| CEAR | Central East African Railway: concessionaire in Malawi |
| CFA franc | Common currency used by "Financial Community of Africa", 13 African countries in West and Central Africa. Which is tied to the French franc. Until January 1994, the exchange rate was 50 CFA franc = 1 French franc but it then devalued to 100 CFA franc = 1 French franc. |
| CFM | Portos e Caminhos de Ferro de Moçambique (Mozambique Ports and Railways): the government–owned railway operator in Mozambique |
| DRC | Democratic Republic of Congo (Zaire) |
| NLPI | New Limpopo Projects Investments: concessionaire in Zambia and for BBR |
| Ntk | Net tonne-kilometre; one tonne of freight moving one kilometre |
| Operating expenses | Cost of operations, including depreciation |
| Operating ratio | Ratio of operating expense to revenue (above 100 percent means revenue is insufficient to cover cash outgoings plus the cost of replacing assets as they fall due – assuming depreciation is calculated realistically on a replacement cost basis) |
| PSO | Public Service Obligation; payments by governments to operators who perform services under government direction which they not undertake if operating in a purely commercial manner. In the context of African railways, this normally refers to loss-making passenger services which a government wishes a concessionaire to continue to operate. |
| RDC | Railroad Development Corporation: US-based company which is a part-owner of both the Malawi and Nacala concessions |

| | |
|---|---|
| RITES | Railways of India Technical and Engineering Services: consultancy arm of Indian Railways which is the Beira concessionaire |
| RSZ | Rail Systems of Zambia: concessionaire in Zambia |
| Take or pay | A form of contract in which a user is charged per tonne but is also subject to a minimum charge if less use is made of the service than contracted |
| TU | Traffic units: a composite measure of railway activity calculated as the sum of passenger-km and net tonne-km |
| WACEM | West Africa Cement Company: operator of residual Togo system |
| Working expenses | Expenditure excluding depreciation and non-operating costs |
| Working ratio | Ratio of working expenses to revenue (above 100 percent means that revenue is insufficient to cover cash outgoings) |

# PRIMARY DATA SOURCES

There are almost no official data sources in which financial and operating data is readily available. The data in the report has been collected directly from the operators in the cases of Sitarail, Camrail, Madarail and CEAR in Malawi. All other data has been collected from a variety of news reports, secondary reports and personal communications. The main sources used are listed below; however, many of them conflict with each other (and in some cases are internally inconsistent) and the data used in the report represents a best estimate based on the available information.

## General/Regional

(i) Banque de France (www.banque-france.fr). Rapport zone franc. Annual review of relevant countries which includes some rail-related material.

(ii) Bolloré website (www.bollore.com). Annual report provides some summary rail information.

(iii) Comazar website (www.comazar.com). Information on company and rail concessions.

(iv) COMESA News (www.comesa.int). This website often contains transport-related material on COMESA members, for example, November 2004 provides recent port throughputs and transit volumes.

(v) Giros E and di Borgo P, 2005. "Railway Concessions in Sub-Saharan Africa; Opinion of a Concessionaire on Transaction Design." (www.worldbank.org/transport/learning/railways.html).

(vi) Interrail (www.isted.com/periodiques/interrail). Magazine with informative English/French articles about African railways.

(vii) OT Africa Line (OTAL) (www.otal.com). Newsletters and Transport Reports. December 2003 on Congo Brazzaville and DRC, September 2003 and March 2005 on Angola, June 2004 on Ghana, and many others. Also reports on port-related rail developments on the west coast of Africa as far south as Angola.

(viii) Steenkamp, T. 2002. "Rail Privatisation Makes a Slow Start in Africa"- Privatisation: Africa. International Railway Journal, November 2002. (www.findarticles.com).

(ix) Railways of Africa (www.fahrplancenter.com/Afrikanische_Bahnen.html). This website contains varying amounts of operational information on almost all the African rail systems.

(x) Southern African Railways Association (SARA) (www.sararail.org). September 2002. The Development of International Rail Freight Corridors in Southern Africa. SIAFI Africa Seminar.

(xi) Strong J. 2000 "The development of Railway Concessions in West And Central Africa." World Bank Institute and Journal of Structured Finance (Winter 2004). One of the best sources for the early stages of the Sitarail, Camrail and Gabon concessions.

(xii) Port Management Association of Eastern and Southern Africa (PMAESA) (www.pmaesa.org). This website regularly has port-related railway items.

(xiii) Présentation des expériences des réseaux en matière de partenariat public privé. Réunion de Concertation Ferroviaire d'Afrique Francophone et de Madagascar. 2001. Douala.

(xiv) Railroad Association of South Africa (www.rrr.co.za). This site has news clippings going back over 40 years.

## Country/Corridor-specific

(i) Angola:

- Angola Peace Monitor, Vol XI, Issue 1, October 2004.. Summary of then-situation on Benguela and Mocamedes Railways. (www.actsa.orgg/anola/apm).

(ii) Beit Bridge Railway:

- Home page of NLPI (www.nlpi.net). This includes several items on both BBR and Ressano Garcia.
- ANC daily news briefing, 12/12/97 and 10/12/99. Some background on the commencement of construction of the BBR line and subsequent diversion of transit traffic from Botswana Railways. (www.anc.org.za).
- Creamer Media's Engineering News on-line, 16/7/99. Opening of BBR. (www.engineeringnews.co.za).
- Financial Mail, 20/5/2005. A world opens up as region is stitched together again. Article on NLPI. (also see www.nlpi.net/news).
- Goba Moahloli Keeve Steyn. 1999. Engineering data sheet on Beit Bridge Railway.

(iii) Benin-Niger:

- Benin: Infrastructure and Services (www.gouv.bj/en/benin/infrastructures.php). Summary of transport facilities..
- Le Secteur des Transports from Niger regulatory authority - ARM (www.arm-Niger.org). Summary of Niger transport sector.
- Guide-Benin (www_izf_net). Some information on OCBN.
- Vidjingninou, F. June 2004. "On a wing and a prayer - Benin's only train never runs on time." Description of trip on current service by AFP. (tmb.exodus.ie/exodus/news).

(iv) Cameroon:

- Camrail home page (www.comazar.com/camrail.htm).
- The Cameroonian Railways (www.trainweb.org/railphot/Camrail). Many pictures of post-concessioning operations.

(v) Congo Brazzaville:

- The Republic of Congo on the brink. April 2000. Situation of CFCO as at that time. (www.c-r.org/pubs/occ_papers/brink.shtml).
- Le chemin de fer congolais bientôt sur de nouveaux rails. March 2004. Interview with Minister of Transport and Privatisation. (www.afrikeco,com/atricles/economie.php)

(xii) Côte d'Ivoire

- Mitchell, B. and K.J. Budin. 1997. "The Abidjan-Ouagadougou Railway Concession." World Bank Infrastructure Notes RW-14 and also SSATP Note 13 1998. World Bank, Washington, DC.
- Burkina Faso-Côte d'Ivoire: Security chiefs will meet before border reopens , (November 2003) (www.irinnews.org).

(vi) DRC:

- Afrique Centrale – Les Infrastructures de Transport (INICA). 2004. Summary of current transport networks in DRC. (www.incia.org).
- La mise en oeuvre du projet multimodal de transport estimé à 220 millions USD. February 2005. Investment plan of ONATRA 2005-6. (www.lepotenitial.com).
- Comment l'Onatra a préservé son chemin de fer. Interrail No. 2, July 1997.
- Difficultés actuelles de la SNCC. 2005. Current problems with SNCC, and several other pages at this site. (www.ic-lubum.cd/sncc).
- Sizarail history (www.comazar.com/printdocument.htm).
- Les différentes étapes de la privatisation et de la "renationalisation" de Sizarail. (www.congonline.com/sizarail.htm).

- Rebels take over Zairean Railway. May 1997. (www.maykuth.com/Africa).
- Congo Chronicle XVIII. March 1998.. Release of M. Claes. (www.congoned.dds.nl/chroni18.html).

(vii) Eritrea

- Eritrea Railway & Ropeway. History and description. (www.trainweb.org/eritrean/).

(viii) Ethiopia

- Anyango, G. 1997. "Comparative Costs of Transport: The Northern Tier Countries of the Greater Horn of Africa." Technical Paper No. 60. Office of Sustainable Development, Bureau for Africa, USAID. (www.dec.org/search/index.cfm).
- Le Centenaire du chemin de fer djibouto-éthiopien. March 1997. Interrail No. 3.
- Pankhurst, Dr. R. 1997. "A History of Early Twentieth Century Ethiopia.". Includes a section on the development of the railway. (www.civicwebs.com/cwvlib).
- Le train. History of line. (membres.lycos.fr/ecolekessel/djibouti/train.htm).

(ix) Gabon

- Gestion du rail gabonais. Le mandat d'Eramet-Comilog prolongé de 18 mois. April 2004. (www.webzinemaker.net/lacamerounaise/).
- Comilog. March, 2005. Project for instituting a railway concession in Gabon. Presentation by Comilog to World Bank.
- Transgabonais. A general history and description of the line. (www.therfcc.org/madagascar).
- Proposed concession of Belinga to CVRD as well as reconcessioning of Transgabonais. May 2005. (www.lintelligent.com).
- Faure, F.E. 1999. Dossier Gabon, Echos du SITRASS No. 16. Summmary of track charges paid by COMILOG to OCTRA. (www.ish-lyon.cmrs.fr/let/sitrass/letsitrass16.pdf).
- Le Gouvernement renouvelle sa confiance en SETRAG. April 2004. Appointment of SETRAG to temporarily manage concession. (www.flashgabon.com).

(x) Ghana

- United rail deal not cancelled, suspended. May 2005. (www.ghanaweb.com/ghanahomepage/).
- Ghana railways to be given out on concession. July 2004. (www.ghanaweb.com/ghanahomepage/).
- Don't play politics with railway industry. May 2005. (www.ghanaian-chronicle.com).
- Osei-Antwi, G.B. Improving railways to move Ghana forward (www.ghana.gov.gh/dexadd/feature/improving%20 railways.pdf).
- Spoornet close to Ghana accord. September 2004. (www.railwaygaz.co.uk).
- United Rail has met all criteria set – DIC. April 2005. (www.ghanaweb.com/ghanahomepage/).
- Ghana Rail Company homepage - Ministry of Roads and Transport. (www.ghana.gov.gh/governing/ministries/infrastructure/ports.php).

(xi) Guinea

- OPEC Fund Newsletter. May 2001. Guinea to finance road rehabilitation with Fund Loan. Includes discussion of possible private financing of rail rehabilitation. (www.opecfund.org).
- Mobbs, P.M. and D.E. Morse. "The Mineral Industry of Guinea" in US Geological Survey Minerals Yearbook, various years including 1997 and 1999. Summary of mineral lines, including claimed rehabilitation by Slovak Railways. (minerals.usgs.gov).

- Unpaid railway workers stage rare protest demonstration. September 2004. (www.irinnews.org).

(xiii) Kenya

- Transit Transport Coordination Authority of Northern Corridor. June 2004. "Investment opportunites in the northern corridor with emphasis in transport infrastructure." Paper presented at COMESA Business Summit, Kampala (www.oecd.org/dataoecd/).
- Kenya and Uganda yet to finalise rail privatisation. May 2005. (www.allAfrica.com).
- Alila, P.O., M. Khayesi, W. Odhiambo, P.O. Pedersen. 2005. "Development of African freight Transport – the case of Kenya." DIIS Working Paper No 2005/6. Danish Institute for International Studies. (www.diis.dk).

(xiv) Liberia

- UN/World Bank. 2003. Joint Needs Assessment – Transportation and Transport. (www.undg.org).

(xv) Madagascar

- Madagascar Magazine. Numerous local press articles on Madarail. (www.madagascarmagazine.com).
- EIB. July 2003. Madagascar: EIB provides EUR 11 milion for rail rehabilitation. (www.eib.org).
- Government of Madagascar. 2004. Rapport Annuel de mise en oeuvre du DSRP. Annual report on poverty reduction but includes brief report on first year of concession. (www.simicro.mg).
- Comazar enfin sur les rails. 2003. La lettre de l'Inde. (www.afd.fr/jahia/webdav/).
- Madagascar Tribune. Numerous press articles, including 2004 Madarail Financial Results (July 2005). (www.madagascar_tribune.com).
- Tiako I Madagasikara. Several local press articles. (www.tim-madagascar.net).

(xvi) Malawi

- Beltchika, N., J.D. Stryker, A.A. Mwaze, G.J. Kazembe. 2001. "Barriers to business expansion in Malawi's new policy environment." African Economic Policy Discussion Paper 39. Office of Sustainable Development, Bureau for Africa, USAID. Contains road and rail rates on main trade corridors as at 1999. (www.dec.org).
- Knapp B.J., H. Posner. June 2004. A luta continua. Railway Gazette International. Article on progress since concessioning. (www.rrdc.com).
- Privatisation Commission of Malawi. 2002. Concession – CEAR Ltd. (www.privatisation.malawi.org).
- Office of the Vice President. 2000. Policy Analysis Project, Sectoral Report on Transport. Includes costs on main trade routes and summary of KPMG 1998 report on Nacala route. (www.econmancap.com/reports/sect_report_7_Tpt.pdf).
- Diagnostic Trade Integration Study, Volume 2, Chapter 3, Transport Sector. 2002. (www.integratedframeowrk.org/countries/malawi.htm).
- Nacala Development Corridor. 2003. "Overview of economic benefits accruing from the operation of a seamless Nacala Development Corridor." (www.nacalacorridor.com).
- RDC website (www.rrdc.com). Includes material on CEAR, including details of OPIC.
- Relief in sight for Nacala corridor. August 2005. Leasing of Sheltam locomotives. (ports.co.za).
- World Food Program. 2002. Emergency repairs and capacity increase of the Nacala Line. Includes comparative costs by different routes. (www.wfp.org/operations/).

(xvii) Mozambique

- CFM website (www.cfmnet.co.mz). General information on Mozambican ports and rail concessions, including some throughput data.
- Jacobs Consultancy. 2005. Republic of Mozambique. "Railways and Ports Restructuring Project." Transport Cost Study Draft Final Report. IBRD."

(a) Beira.

- DANIDA. 1995. Evaluation of the Nordic Assistance to the BPTS Programme. (www.udenrigsministeriet.dk/publikationer/danida and similar).
- IBRD. Project Information Document 30280. 2004. Material related to concessioning of Beira line. (www-wds.worldbank.org)
- CFM hands over Beira rail system. December 2004. (www.bernama.com).

(b) Nacala (see Malawi above).

(c) Ressano Garcia.

- Maputo Corridor Logistics Initiative website (www.mcli.co.za). In particular, two papers presented to November 2004 UNCTAD Conference on Design and Implementation of Transit Transport Arrangements.

(xviii) Nigeria

- Steps to rehabilitate Nigeria's railway system. May 2005. (www.railserve.com/railnews/).
- Odeleye, J.A. 2000. "Public-private participation to rescue railroad development in Nigeria." Japan Railway & Transport Review No. 23. Good summary of history and developments over the past 15 years. (www.jrtr.net/jrtr23/).
- Master plan to revamp Nigerian railroads. 1999. Summary of plans for standard-gauge network, discussions of steel plant railways and proposed TGV. (www.vegamedia.com/nigeria/).

(xix) Senegal

- Stark, D. "Urbanisation and cultural assimilation in British and French West Africa 1900-60." Includes impact of railways on development. (www.donaldstark.co.uk).
- The slow train to Bamako. October 2004. Account of ride on post-concessioning passenger train. (travel.independent.co.uk/africa/).
- OGCTI. A necessary step towards privatization of the Dakar-Bamako line. Interrail No. 4. October 1998.
- Impact of transport and logistics on Mali's trade and competitiveness. 2004. Tess project undertaken by USAID. (www.tessproject.com/products/special_studies/).
- Comment transformer l'enclavement du Mali en atout dans la sous-région. August 2004. Current trade flows. (www.malipages.com).

(xx) Sierra Leone

- Alldridge, T.J. 1970. "A Transformed Colony: Sierra Leone, as it was, and as it is. Its progress, peoples, native customs and undeveloped wealth." Westport, Connecticut: Negro Universities Press. Originally published in London: Seeley & Co., Ltd., 1910: Impact of railways on development.
- Sierra Leone. 2005. Description of the Pepel Island line. (www.derbysulzers.com).

(xxi) Sudan

- Sudan Railroads. 1991. Information taken from Library of Congress Country Studies, summary description of networks. (www.geographic.org).

- Nour, O.M. 2001. “The signicance of rail links in Africa.” (www.aboutsudan.com/conferences/khartoum/).
- Musa, E.A. “Sudan Structural Adjustment Program: Some Implications for Labour in the Formal Sector.” African Training and Research Centre for Administration in Development. Discusses concessioning of catering to staff union. (unpan1.un.org/intradoc/groups/public/documents/).

(xxii) Tanzania

- Presidential Parastatal Reform Commmission. 2003. “Concessioning of the business of TRC: Invitation to pre-qualify.” (www.psrctz.com).
- Pedersen, P.O. 2005. “The Tanga-Moshi-Arusha corridor: decline or restructuring of an African transport corridor.” CDR Working Paper 1.06. Centre for Development Research. (www.cdr.dk).
- TRC. May 2005. “Private Investor Will Be Known in June, Take Over in December.” (www.nationmedia.com).

(xxiii) Togo

- Togo. Information on the WACEM transfer and RITES contract. (www.fahrplancenter.com/Togo.html).
- Mobbs, P. 1996. “The Mineral Industry of Togo.” Summarizes mineral resources. (minerals.usgs.gov/minerals/pubs/country).
- Rocks for Crops. Section on Togo contains a good map of the phosphate deposits and the associated transport system and ports. (www.uoguelph.ca/~geology/rocks_for_crops/53togo.pdf).

(xxiv) Zambia

- Website of NLPI (the concessionaire) (www.npli.net). Contains several press articles on aspects of the concession since handover.
- Ministry of Communications and Transport. 2003. “Minutes of the stakeholders meeting to review the railway concession performance.”

(xxv) Zimbabwe

- Pedersen, P.O. 2002. “Zimbabwe’s changing freight transport and logistical system.” Working Paper 2.04. Centre for Development Research. (www.cdr.dk).

# SELECTED REFERENCES

The references below provide general background and discussion on, firstly, the development of the African railway network and, secondly, on general issues concerning railway reform and privatisation.

Bravenboe, B. and W. Rusch. 1997. “The First Hundred Years of State Railways in Namibia.”

Budin, K.J. 1997. ”Concessioning of rail transport.” SSATP Note 10. World Bank, Washington, DC.

Compagnie du Chemin de Fer du Bas-Congo au Katanga. 1956. “Compagnie du Chemin de Fer du Bas-Congo au Katanga 1906 – 1956.” Company history but covers all railways in Congo.

Croxton, A. 1982. “Railways of Zimbabwe.” Includes early proposals for the eventual BBR route and also covers the Zambia and Beira networks.

Deutsche Kolonialgesellschaft. Deutscher Kolonial-Atlas mit Jahrbuch. 1900s, especially 1906 and 1908. Describes early development of German colonies of the time.

Estache, Antonio and Tomás Serebrisky. 2004. “Where Do We Stand on Transport Infrastructure Deregulation Public-Private Partnership?” World Bank, Washington, DC.

Gómez-Ibáñez, José A. 2004. “Railroad Reform: An Overview of the Options.” Conference on Railway Reform, Rafael del Pino Foundation, Madrid.

Hill, M. 1961. “Permanent Way.” East Africa Networks. Volume 1 covers Kenya and Uganda and Volume 2 deals with Tanzania.

InfraAfrica. 2001. “Review of progress in the development of transit transport systems in eastern and southern Africa.” UNCTAD.

Jorgensen, A.A. 2003 “Integrating rail operations across national borders to facilitate trade.” Africarail 2003. (www.rra.co.za).

Karanga, A. 2001. “Transit par voie ferroviaire en Afrique de l’Ouest et du Centre.” Symposium sur le transport en transit en Afrique de l’Ouest et du Centre 2001, Abidjan.

Karanga A. 2005 “The Transit of Goods.” Part of ECOWAS atlas. (www.afriquefrontieres.org).

Kieran, Peter. 2004. ”Railway Concessions – Attracting investment for an improved service.” TransAfrica21.

Lafont, D, 2005. “The Challenges of Multimodal Transport to Landlocked African Countries.” Discusses Bollore experience.

Lartilleux, H. 1950 “Géographie Universelle des Transports, Tome 1 (Géographie des Chemins de Fer Français), Volume IV (France Lointaine).” A detailed description of the development and long-term plans for railways in the French overseas possessions.

Mbangala, Mapapa. 2001. “Transport ferroviaire en Afrique noire: Fonctionnement – Performances – Perspectives.” University of Liège. DEA analysis of comparative railway efficiency between 1975-1990.

Mbangala, Mapapa. 2005. “Efficacité Économique du Rail en Afrique Subsaharienne.” University of Liège. Above analysis extended to 1980-2001.

Mlenga M. 2003. “The Southern African railways experience: an operations and policy overview.” Asia Pacific Rail.

Murdoch, Jill. 2005. “Assessing the Impact of Privatization in Africa – case study of Camrail, Cameroon.” World Bank, Washington, DC.

O’Connor, A.M. 1965. “Railways and Development in Uganda.” East African Institute of Social Research, Nairobi.

Pheffer, P.E. 1975. “Railroads and Aspects of Social Change in Senegal 1878-1933.” Ph.D thesis, University of Pennsylvania. Political and economic background to the Senegal network.

Pozzo di Borgio, Pierre. (forthcoming). “Rail Concessions in Africa.” World Bank, Washington, DC

Pozzo di Borgio, Pierre. 2005. “Railway Concession Experience in Sub-Saharan Africa.” World Bank, Washington, DC.

Snow T., M. Faye, J. McArthur, J. Sachs. 2003. “Country case studies on the challenges facing landlocked developing countries.” UNDP Human Development Report Office.

Thompson, Louis S., Karim-Jacques Budin and Antonio Estache. 2001. “Private Investment in Railways: Experience from South and North America, Africa and New Zealand.” European Transport Conference.

World Bank. 2002. “Guide de mise en concession ferroviare – application aux réseaux africains.” (www.worldbank.org/afr/ssatp/).