Annex A: Traffic Study

East African Railways Master Plan Study

Traffic Working Paper

Prepared for:

East African Community

Prepared by:

CPCS

Project No. 06089

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Glossary

CBRU	Democratic Republic of Congo, Burundi, Rwanda, Uganda
CCTTCA	Central Corridor Transit Transport Coordination Authority
COMESA	Common Market for Eastern and Southern Africa
CPCS	CPCS Transcom
DSM	Dar es Salaam
EAC	East African Community
EAC-DS	East African Community Development Strategies
EADB	East Africa Development Bank
KPA	Kenya Ports Authority
KRC	Kenya Railways Corporation
MSA	Mombasa
MSC	The Marine Services Company Ltd
NCTTCA	Northern Corridor Transit Transport Coordination Authority
NEPAD	New Partnership for Africa's Development
RVR	Rift Valley railways
SADC	South Africa Development Commission
SDI	Spatial Development initiative
SSATP	Sub-Saharan Africa Transport Program
TAZARA	Tanzania - Zambia Railway Authority
TOR	Terms of Reference
TRC	Tanzania Railways Corporation
TRL	Tanzania Railways Limited
UAR	Union of African Railways
UNECA	United Nations Economic Commission for Africa
UNCTAD	United Nations Conference on Trade and Development
URC	Uganda Railways Corporation

Executive Summary

Authority for this Study

This project is carried out under the Contract dated 12 July 2007 between the East African Community (EAC) and CPCS Transcom International Limited ("CPCS") to carry out the East African Railway Master Plan Study ("Master Plan Study").

Purpose of this Report

The objective of this Traffic Working Paper is to review current railway traffic handlings, assess truck competition and forecast the future demand for railway services. This Working Paper is designed to provide input into the Railway Master Plan report to be developed as the main output of this study.

The railways of Kenya, Uganda and Tanzania play an important role not only in the economic development and social environment of these countries, but they also provide an access to the ports of Mombasa and Dar es Salaam for the landlocked countries of southern Sudan, Rwanda, Burundi, Eastern Democratic Republic of Congo and Zambia. They are critical for these countries, ensuring the transport of goods at competitive rates, supporting the development of industries and the creation of jobs and providing safe and efficient transport of commuters and passengers.

These railways have lost significant market share to trucks over the past years as the result of a long series of problems which contributed to deteriorating services to a point where many shippers had no choice but to use trucks to get their goods to market.

The new concessionaires of the Kenya-Uganda and the Tanzania railways have the potential to more than triple the current handlings over the next 20 years while improving the railway infrastructure and rolling stock. They have the potential not only to regain market share lost to trucks with improved services, but can also grow by capturing the traffic that will be available as the result of new initiatives, industries and mining developments in their respective catchment areas which are being promoted by the Northern and Central Corridor Transit Transport Coordination Authorities.

The potential economic development of the EAC and surrounding countries could also require the rehabilitation of existing unused railway lines, the construction of additional railway lines or the extension of current lines and services to move goods to destination.

The purpose of this report is to quantify the potential traffic forecasts for existing railways and identify potential traffic for new railway lines within the EAC countries in order to serve as input in the preparation of the EAC Railway Master Plan to be developed as the final deliverable of this study.

1 Background

1.1 Introduction

This project is carried out under the Contract dated 12 July 2007 between the East African Community (EAC) and CPCS Transcom International Limited ("CPCS") to carry out the East African Railway Master Plan Study ("Master Plan Study"). The objectives of the assignment are:

i. Evaluate the current and potential demand for railways infrastructure and services, in the context of the EAC overall Development Strategy and objective to become more competitive, through the reduction of transport and transactional cost and times of particularly trade.
ii. Review the current railways capacity and planned improvements and establish the gap between this capacity and the requisite railways infrastructure and services that will be able to cater for future demand.
iii. Propose a railways development strategy and action plan (Master Plan) to close the gap and develop the required level of infrastructure and services needed to make a maximum contribution in facilitating and catalyzing more robust regional trade and economic development.
iv. Prepare suitable organizational structure necessary to implement the Master Plan[1].

This report is one of five reports to be produced under the Master Plan Study:

- Inception Report
- **Traffic Working Paper** (this document)
- Infrastructure Working Paper
- Draft Final Report (Master Plan)
- Final Report

1.2 Objectives for This Report

The key objective for this Report is to establish the potential demand for railway transport to serve as input for the configuration of the infrastructure to be developed in order to implement the East African Railways Master Plan.

1.3 Organization of This Report

In addition to the Executive Summary and this Introduction, the Report consists of nine additional chapters:

Chapter 2 briefly reviews the markets and areas that are involved in the scope of this study.

[1] Project TOR, page 8.

Chapter 3 takes a look at historic and forecast GDP and other economic indicators of the EAC countries.

Chapter 4 reviews the historical and forecast traffic for the Ports of Mombasa and Dar es Salaam.

Chapter 5 reviews the historic traffic for both freight and passenger services and forecast freight traffic for the EAC railways, KRC, URC, TRL and TAZARA.

Chapter 6 reviews existing railway tariffs and average revenues per net-tonne-km, compares them to competing transport modes, assesses the railway competitiveness and reviews the relative market shares of rail and truck transport in the area.

Chapter 7 reviews previous studies of the market and rail potential for the current EAC railways.

Chapter 8 outlines the assumptions for the Base Case, Low and High Scenario forecasts of rail traffic for the horizon 2008 to 2030.

Chapter 9 addresses the markets, potential new developments and initiatives that would generate significant additional transport volumes for KRC, URC and TRL.

Chapter 10 reviews the new railway links being considered in the geographic area of EAC countries and the corresponding market initiatives.

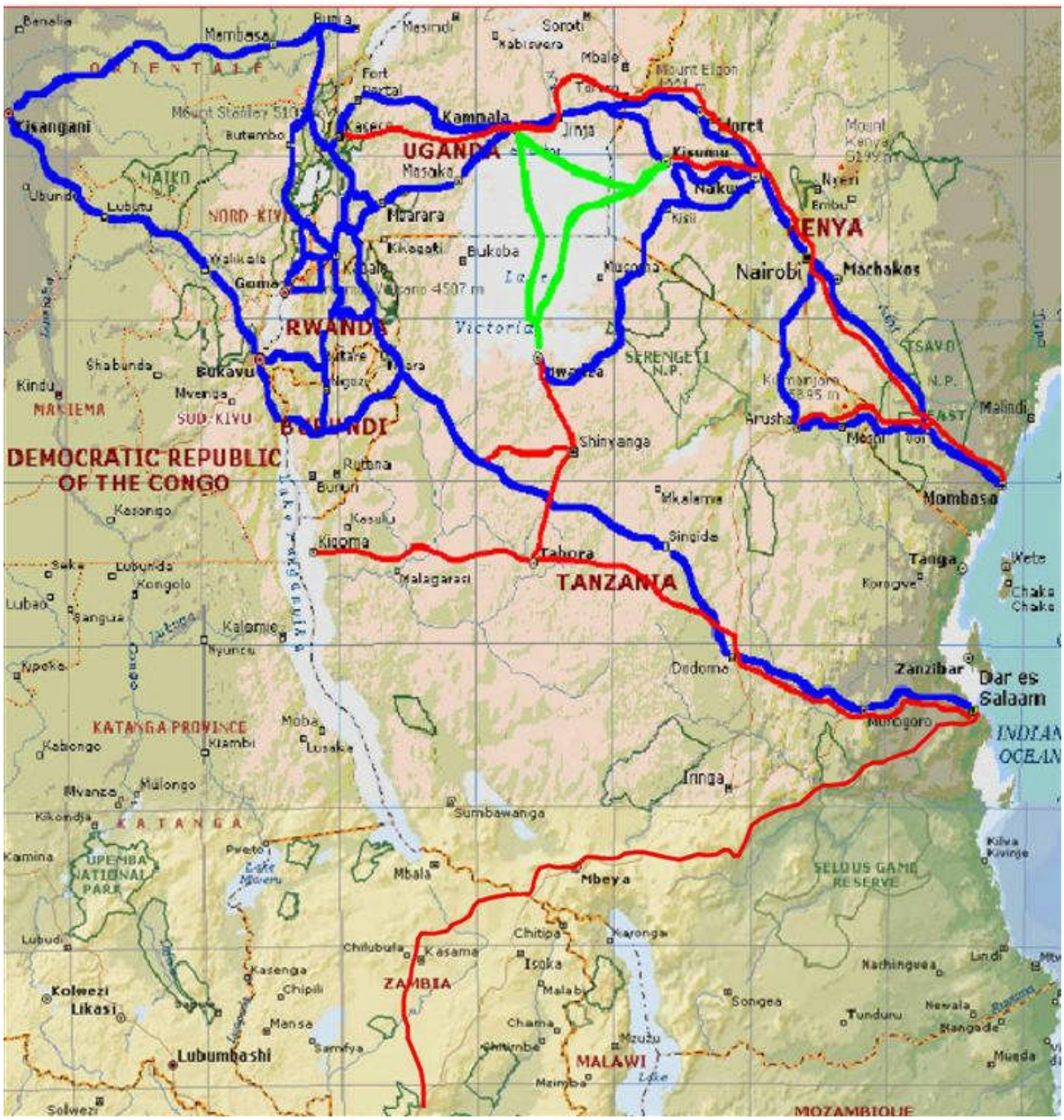
Chapter 11 details the freight forecasts for each scenario as far as Tonnes, Net-Tonne-Kms and Revenues are concerned for the planning period.

Chapter 12 provides Conclusions and discusses Issues and Risks.

2 Markets

Following is a map of the area of interest with the railway lines (red), ferries (green) and main highways (blue) highlighted:

Figure 2.1: EAC Railway Lines, Ferries, and Main Highways



2.1 Domestic Freight

Freight from the coast broadly consists of bulk inputs such as petroleum and fertiliser for distribution to primary industry, together with general freight such as consumer goods and construction materials. Freight originating in inland centres largely consists of primary produce which in some cases undergoes processing prior to transport.

2.2 Transit Freight

The transit segment consists of traffic originating in or destined to the land locked countries known as CBRU, Zambia and southern Sudan. This traffic, made up of general freight, industrial commodities and containers is transported along:

- the 'Northern Corridor' which links Mombasa to Kampala where freight can travel either by road or rail over a distance of some 1200 km;
- the 'Central Corridor', running from Dar-es-Salaam to Mwanza and Kigoma via Tabora, where freight typically travels some 1,200 km;
- the 'Southern Corridor' from Dar-es-Salaam to Zambia via TAZARA, where freight travels up to 2000 km.

The two principal transport corridors linking the ports of Mombasa and Dar es Salaam to the CBRU land locked countries are the Northern Corridor from Mombasa which offers the shortest route by both rail and road to Uganda and the Central Corridor from Dar es Salaam which is the shortest route to Burundi, Rwanda, and the eastern Congo.

The Northern Corridor

The continuous rail route on the Northern Corridor from Mombasa to Kampala in Uganda is 24% shorter than the rail/lake route from Dar es Salaam.

Continuing bureaucratic constraints and recent significant traffic growth in the port at Mombasa coupled with Kenya Railways problems have combined to affect the overall performance of rail transport on the Northern Corridor and this has been demonstrated in the growth of Ugandan traffic through Dar es Salaam. While Mombasa appeared to be responding to the improved performance of Dar es Salaam, and the Kenya and Uganda Railways have been concessioned, the port of Mombasa has recently seen shipping lines threaten to impose a US$ 200 surcharge for containers destined to Mombasa given the bad turn-around and service they have been subject to.

The Central Corridor

The Central Corridor serves the domestic market of mainland Tanzania and the transit market of the CBRU Countries. It has an inherent competitive advantage over the Northern Corridor for transit traffic to DRC, Burundi and Rwanda, because it is generally shorter and traverses only a single border crossing for all destinations.

The transport system within the Central Corridor is characterised by:

- a meter gauge running across the country to the Great Lakes;
- an East-West road network, which is still in the process of development;
- a major seaport situated in Dar es Salaam, which handles more than 90% of all maritime traffic in Tanzania;
- economic activities centred on the terminals of the railway line, at Mwanza, Kigoma and Isaka, creating fairly long transport hauls for domestic traffic;

- a high proportion of transit traffic between Dar es Salaam port and the CBRU countries.

The success of rail freight transport on the Central Rail Corridor therefore hinges on meeting the competitive challenge of the Northern Corridor, as well as responding to the improvements from the developing Road Freight Industry in Tanzania.

3 GDP and Its Relations with Transport Growth

3.1 Historic by Country

3.1.1 Kenya

Although the share of agriculture in Kenya's GDP has been steadily declining, this sector still dominates the economy. Kenya's GDP has grown by 4.3%, 5.2% and 5.0% in 2004, 2005 and 2006 respectively and the Economist Intelligence Unit (EIU) is forecasting Kenya's GDP to continue to be robust and to grow by 6.1% in 2007 and 5.5% in 2008.

3.1.2 Tanzania

Agriculture, forestry and fishing make up approximately 45% of Tanzania's GDP. Tanzanian GDP growth has been strong for the past years; it has grown by 6.8% and 5.8% in 2005 and 2006 respectively and the Economist Intelligence Unit (EIU) is forecasting Tanzania's GDP to continue to be robust and to grow by 6.7% in 2007 and 7.2% in 2008.

3.1.3 CBRU Countries

Uganda's agriculture is the most important sector of the economy, accounting for 40% of GDP which has grown at an average of 5.3% per year for the past 3 years and the EIU is forecasting 5.8% for 2006 and 6.0% for 2007.

As far as the other countries where transit traffic is destined, Rwanda, Burundi and DRC, they are also expected to have strong GDP growth in the years to come. Furthermore, some of these countries are emerging from periods of civil strife and it is expected that peace will fuel imports and exports.

3.2 Historic and Forecast GDP

The following table illustrates the historic and forecast GDP by country:

Table 3.1: Recent GDP Performance and Projected GDP Growth by Country (%)

GDP Actuals and Forecasts (%)							
	2002	2003	2004	2005	2006	est 2007	est 2008
Kenya	0.4	2.8	4.3	5.2	5.0	6.1	5.5
Uganda	6.8	4.3	5.7	6.0	5.3	5.6	5.7
Tanzania	7.2	7.1	6.7	6.8	5.8	6.7	7.2
Rwanda	9.4	1.0	4.0	5.2	5.8	6.0	6.0
Burundi	4.5	-1.2	4.8	0.9	3.8	5.0	5.5
DRC	3.5	5.7	6.6	6.5	6.4	6.8	6.0

Source: EIU

3.3 Transport Growth Compared to GDP

It is recognized and accepted that a country's transport growth rate broadly correlates with its GDP growth rate. While there are many factors influencing this relationship, such as

emerging vs industrialized countries, domestic vs transit transport markets, etc… the ratios of transport growth to GDP growth normally range between 1.0 and 1.5, i.e., transport growth is expected to growth by up to 1.5 times the growth of GDP.

We have not conducted a detailed analysis of this relationship[2] for the countries involved in our study and have chosen to reflect this 1.0 to 1.5 range by incorporating it in our assumptions supporting the forecast scenarios which we will present later in Chapter 8.

[2] The coefficient of elasticity between traffic growth and GDP growth varies from country to country, based on economic structure and level of development.

4 Ports Data

4.1 Mombasa

The port of Mombasa has experienced 6.3% average annual growth in the total tonnage handled from 2001 to 2006 while its average annual growth for container traffic was 10.5% for the same period as evidenced by the data in the following table:

Table 4.1: Mombasa Port Throughput

Mombasa Port Throughput						
	2001	2002	2003	2004	2005	2006
IMPORTS ("000" DWT)						
Containerized Cargo	1,672	1,624	2,228	2,599	2,645	2,970
Conventional Cargo	1,165	1,196	1,209	1,236	1,009	1,129
Dry Bulk	1,168	1,098	1,404	1,588	2,128	2,344
Bulk Liquids	4,294	3,926	4,491	4,595	4,918	5,403
TOTAL	**8,299**	**7,844**	**9,332**	**10,018**	**10,700**	**11,846**
of which Transit In	1,844	1,875	2,186	2,590	3,202	3,583
EXPORTS ("000" DWT)						
Containerized Cargo	1,406	1,466	1,135	1,669	1,680	1,625
Conventional Cargo	185	241	208	198	139	185
Dry Bulk	211	464	380	381	286	313
Bulk Liquids	196	209	271	246	173	132
TOTAL	**1,998**	**2,380**	**1,994**	**2,494**	**2,278**	**2,255**
of which Transit Out	273	340	266	300	334	335
TOTAL IMPORTS & EXPORTS	**10,297**	**10,224**	**11,326**	**12,512**	**12,978**	**14,101**
Transhipment	303	340	605	409	303	318
TOTAL ("000" DWT)	**10,600**	**10,564**	**11,931**	**12,921**	**13,281**	**14,419**
Container Traffic (TEUs)	**290,500**	**305,427**	**380,353**	**438,597**	**436,671**	**479,355**

Source: KPA

The following table details the container traffic handlings for the years 2000 to 2006:

Table 4.2: Mombasa Port Container Traffic Handlings

Container Traffic (TEUs)								
		2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
IMPORTS	Full	95,243	117,855	127,424	159,379	189,911	193,223	217,869
	Empty	17,103	16,642	15,935	14,160	14,007	14,573	11,596
	Total	112,346	134,497	143,359	173,539	203,918	207,796	229,465
EXPORTS	Full	62,186	72,176	75,765	78,460	90,539	94,120	86,317
	Empty	44,729	58,058	58,935	78,749	109,895	107,467	132,237
	Total	106,915	130,234	134,700	157,209	200,434	201,587	218,554
TRANSHIPMENT	Full	16,542	24,727	26,746	43,778	29,336	22,318	21,825
	Empty	1,125	1,042	622	5,827	4,909	4,970	9,511
	Total	17,667	25,769	27,368	49,605	34,245	27,288	31,336
TOTAL	Full	173,971	214,758	229,935	281,617	309,786	309,661	326,011
	Empty	62,957	75,742	75,492	98,736	128,811	127,010	153,344
	Total	236,928	290,500	305,427	380,353	438,597	436,671	479,355

Source: KPA

Transit traffic handlings at the port of Mombasa have grown at an average of 18% per year between 2000 and 2006, from 1.4M to 3.9M tonnes per year and represented 27% of the port's handlings in 2006 compared to 16% in the year 2000.

Table 4.3: Mombasa Port Transit Traffic (tonnes)

Transit Traffic - Port of Mombasa								
Country		**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
UGANDA:	Imports	898,850	1,452,341	1,426,772	1,676,918	1,988,456	2,433,166	2,572,335
	Exports	215,736	217,475	283,326	216,772	221,438	247,064	249,796
	Total	1,114,586	1,669,816	1,710,098	1,893,690	2,209,894	2,680,230	2,822,131
TANZANIA:	Imports	78,699	126,125	134,809	161,466	200,902	245,975	245,975
	Exports	14,455	19,809	22,160	20,314	28,951	35,452	24,169
	Total	93,154	145,934	156,969	181,780	229,853	281,427	270,144
BURUNDI:	Imports	1,783	2,939	24,738	2,791	19,181	28,462	66,182
	Exports	538	3,827	4,022	1,414	588	313	1,277
	Total	2,321	6,766	28,760	4,205	19,769	28,775	67,460
RWANDA:	Imports	51,130	88,457	66,241	164,021	179,599	194,440	225,412
	Exports	20,584	20,610	14,581	12,781	22,218	24,150	27,701
	Total	71,714	109,067	80,822	176,802	201,817	218,590	253,113
SUDAN:	Imports	45,030	67,197	92,836	75,019	64,643	141,394	130,022
	Exports	44	174	163	308	2,582	5,420	7,822
	Total	45,074	67,371	92,999	75,327	67,225	146,814	137,844
D.R. Congo	Imports	26,875	57,220	85,575	57,129	85,515	113,509	202,832
	Exports	49,418	11,299	14,650	14,462	21,429	20,685	23,634
	Total	76,293	68,519	100,225	71,591	106,944	134,194	226,466
OTHERS:	Imports	50,985	49,248	43,668	49,061	51,925	45,019	140,453
	Exports	198	121	1,416	135	3,170	665	232
	Total	51,183	49,369	45,084	49,196	55,095	45,684	140,685
TOTAL:	Imports	1,153,352	1,843,527	1,874,639	2,186,405	2,590,221	3,201,965	3,583,212
	Exports	300,973	273,315	340,318	266,186	300,376	333,749	334,632
	Total	**1,454,325**	**2,116,842**	**2,214,957**	**2,452,591**	**2,890,597**	**3,535,714**	**3,917,844**
% Transit		**15.9%**	**20.0%**	**21.0%**	**20.6%**	**22.4%**	**26.6%**	**27.2%**

Source: KPA

4.2 Dar es Salaam

The port of Dar es Salaam has seen its traffic grow at 9.7% per year from 2000 to 2006, which represents a growth rate 50% higher than that of the port of Mombasa.

Table 4.4: Dar es Salaam Port Cargo Traffic

Cargo Traffic - Port of Dar es Salaam (000 Tonnes)							
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Imports	3,058	3,512	3,631	4,072	4,763	4,829	5,225
Exports	745	666	724	881	920	1,051	1,036
Transhipment	31	93	169	246	371	405	428
TOTAL	**3,834**	**4,271**	**4,524**	**5,199**	**6,054**	**6,285**	**6,689**

Source: TPA

During this period, its container traffic increased by 13.9% per year as shown in the following table:

Table 4.5: Dar es Salaam Port Containerized Cargo

Containerized Cargo - Port of Dar es Salaam (TEUs)							
	2000	2001	2002	2003	2004	2005	2006
Imports	62,119	68,921	73,090	90,135	105,594	115,215	121,471
Exports	60,549	66,519	68,297	77,663	93,730	113,513	120,776
Transhipment	1,980	6,280	12,409	18,319	27,790	29,661	30,453
TOTAL	124,648	141,720	153,796	186,117	227,114	258,389	272,700

Source: TPA

TRC and TAZARA's rail market share of the port of Dar es Salaam has eroded significantly to the benefit of trucks as evidenced by the following table:

Table 4.6: Dar es Salaam Port Imports Clearance by Road and Rail

Imports' clearance by Road and Rail							
	2000	2001	2002	2003	2004	2005	2006
DRY CARGO (000T)							
Road	1,089	1,061	1,160	1,307	1,606	1,646	2,069
Rail	334	351	266	273	268	233	208
Total	1,423	1,412	1,426	1,580	1,874	1,879	2,277
Rail %	**23.5%**	**24.9%**	**18.7%**	**17.3%**	**14.3%**	**12.4%**	**9.1%**
CONTAINERS (TEUs)							
Road	42,322	54,013	63,700	74,015	84,879	103,452	110,767
Rail	6,100	9,074	8,384	9,051	9,164	9,556	8,786
Total	48,422	63,087	72,084	83,066	94,043	113,008	119,553
Rail %	**12.6%**	**14.4%**	**11.6%**	**10.9%**	**9.7%**	**8.5%**	**7.3%**

Source: TPA

Over a two-year period from 2002/03 to 2004/05, the port of Dar es Salaam has seen its transit traffic increase by 67% as shown in the following table:

Table 4.7: Dar es Salaam Port Transit Traffic

Transit Traffic - Port of Dar es Salaam (Tonnes)									
	2002-03			2003-04			2004-05 Estimate*		
	Imports	Exports	Total	Imports	Exports	Total	Imports	Exports	Total
Zambia	529,599	90,975	**620,574**	597,011	147,318	**744,329**	787,208	113,492	**900,700**
DRC	102,428	1,082	**103,510**	130,736	10,974	**141,710**	195,272	26,952	**222,224**
Burundi	48,812	24,301	**73,113**	63,401	12,795	**76,196**	133,736	22,655	**156,390**
Rwanda	38,275	7,037	**45,312**	28,301	6,313	**34,614**	76,839	7,751	**84,590**
Malawi	75,461	184	**75,645**	60,684	296	**60,980**	131,481	2,798	**134,279**
Uganda	23,651	18,713	**42,364**	123,778	18,135	**141,913**	88,256	20,884	**109,139**
Total	818,226	142,292	**960,518**	1,003,911	195,831	**1,199,742**	1,412,790	194,531	**1,607,322**

* Estimate based on data for 9.5 months

Source: TPA

4.3 Transit Traffic handlings

The transit traffic to the CBRU countries has natural corridors as discussed previously, which are basically a function of distance, service offerings and costs. One should however keep

in mind that Uganda has an interest in ensuring it maintains access to both routes to the Indian Ocean for strategic reasons.

As shown in the following table, the traffic to CBRU countries has basically been moving along the natural corridors with the exception of traffic to Rwanda for which some 70% has been moving via the port of Mombasa and the Northern Corridor although its more natural route would be via the port of Dar es Salaam and the Central Corridor. We believe that the poor performance of TRL in the past years and the fact that trucking costs are similar from both ports have been responsible for this fact and that as the new concessionaire of the Tanzania railway improves service, a larger portion of this traffic will be moving via the Central Corridor in the future.

Table 4.8: Market Share – Dar es Salaam vs Mombasa

Market Share Analysis: Dar es Salaam vs Mombasa (%)										
	TANZANIA		UGANDA		BURUNDI		RWANDA		DRC	
	DSM	MSA	DSM	MSA	DSM	MSA	DSM	MSA	DSM	MSA
2001	92.6	7.4	6.3	93.7	92.9	7.1	39.4	60.6	59.8	40.2
2002	95.4	4.6	2.3	97.7	69.3	30.7	37.4	62.6	50.2	49.8
2003	95.4	4.6	4.5	95.5	94.6	5.4	22.3	77.7	62.2	37.8
2004	94.5	5.5	5.6	94.4	83.1	16.9	24.3	75.7	63.1	36.9
2005	93.7	6.3	3.2	96.8	84.3	15.7	27.6	72.4	62.9	37.1

Source: TPA

While the port of Mombasa is currently experiencing congestion problems and creating unhappy customers, we believe that they will take the appropriate actions to overcome and solve the problems and that in the long term, traffic flows will generally follow their natural routes and be carried over the most appropriate corridor from their origin or to their destination.

There will naturally be fluctuations in the event of civil unrest, or as the competitive forces of railways and trucks come to play, but over the long run, flows will tend to follow their natural routes.

5 Rail Data

This section presents historical data on the rail traffic. While it presents data up to 2007, the focus of the chapter is the period prior to 2004 for all railways (before the traffic dropped sharply for KRC and URC.

5.1 KRC

While the length of the railway network in Kenya is 2,210 kilometres, some portions of the network are currently not being operated; 1,918 kilometres are part of the concession as well as the rail ferry on Lake Victoria, which is currently not being operated.

5.1.1 Freight

The KRC concessionaire, RVR, operates freight services basically along a spine between the Port of Mombasa on the Indian ocean, crossing through Nairobi and reaching the border with Uganda at Malaba, a distance of some 1,083 kilometres; there is also a line of 217 kilometres going from Nakuru to Kisumu on Lake Victoria where it links with the ferry service; an additional 618 kilometres of branch lines to Butare, Nanyuki, Kitale, Taveta, Nyahururu and Solai are part of the trackage included in the concession.

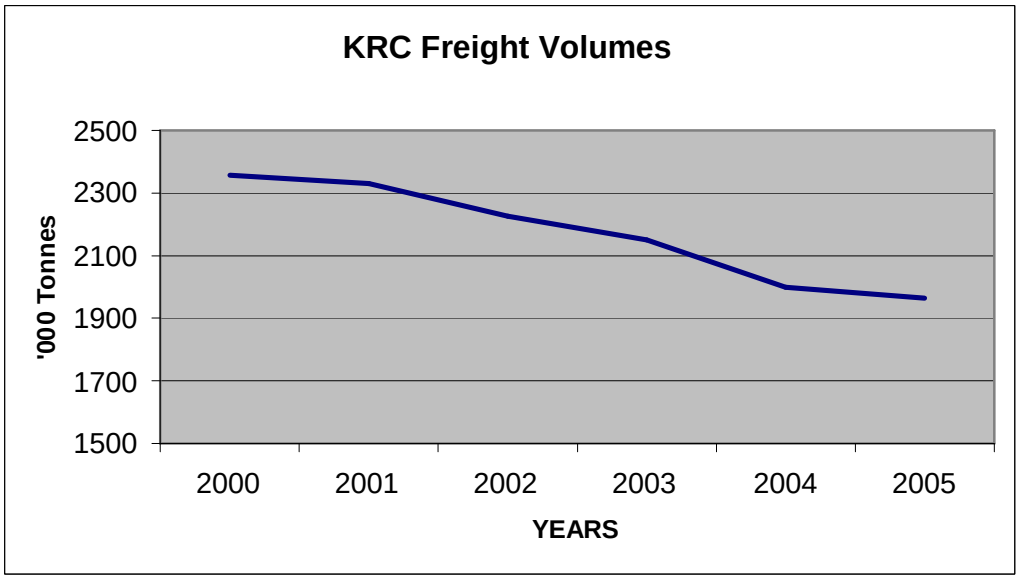
Magadi Soda manages the rail infrastructure between Konza and its plant at Magadi, a distance of 146 kilometres; this trackage is not part of the concession and RVR must continue and honour a contract between KRC and Magadi Soda whereby the latter operates its trains to and from Mombasa by running over KRC's track between Konza and Mombasa, a distance of 457 kilometres.

KRC operated one ferry on Lake Victoria, linking Kisumu to Port Bell on the outskirts of Kampala, but RVR is still in the process of securing insurance for the ferry and it has yet to resume its operation.

Approximately one-third of RVR's handlings consists of Transit traffic originating at the port of Mombasa with Kampala as either a final destination or as a transfer point for furtherance by truck; the other two thirds of its traffic consists of Exports, Imports and Domestic traffic.

While the KRC traffic levels were at the 3.5 million tonnes per year level in the early 90's, they reduced to the 1.6 million tonnes per year level in the mid 90's; they grew to some 2.3 million tonnes per year in the year 2000 only to resume a downward trend once more as evidenced by the following graph:

Figure 5.1: KRC Traffic Levels



Source: KRC

RVR started operating the concession in November 2006 and has managed to basically maintain the latest levels of KRC traffic before the start of the concession. The following table shows their handlings for their first 11 months of operations and corresponding estimated annual tonnage levels of some 1.74 million tonnes:

Table 5.1: RVR Handlings

RVR	11 Months			
	Tonnes	Net T-Km	Revenue (US$)	Wagon-Loads
Cement/Clinker	109,968	58,592,381	3,107,445	2,836
Containers	477,993	329,134,035	15,698,870	24,316
Grains	230,770	186,283,794	8,077,066	5,862
Iron/Steel/Mchy	6,752	7,092,263	317,315	221
PLO	122,490	99,784,546	6,110,189	3,487
Veg Oils	64,861	58,811,759	2,971,230	1,915
Magadi	276,526	126,432,298	1,432,932	6,990
Min/Fert & Chem	146,552	133,255,741	5,340,163	3,890
Foodstuffs	112,018	110,300,712	3,768,302	2,948
Other	44,412	30,105,597	1,335,719	1,506
Total	**1,592,342**	**1,139,793,126**	**48,159,230**	**53,971**
Annual Estimate	**1,737,101**	**1,243,410,683**	**52,537,342**	**58,877**

Source: RVR

Although the freight volumes have been reducing since the year 2000, the traffic patterns of the KRC tonnages have been relatively stable, and there have not been any significant changes to the mix of commodities or the Origin-Destination pairs. The following table shows the traffic distribution of tonnages by commodity for KRC for the fiscal year 2003-04 which we believe is representative of the "good years" of KRC:

Table 5.2: KRC Traffic by Commodity

KRC Traffic (2003-04)	
Commodity	**Tonnes**
Containers	483,364
Soda ash	361,354
Wheat	185,291
Vegetable oil	112,936
Salt	110,894
Oil Fuel	108,743
Grain Other	103,662
Sugar	97,100
Petroleum	71,041
Maize	62,749
Cement	61,910
Coffee	59,594
Fluorspar	36,643
Fertilizer	36,429
Iron and Steel	30,535
LPG	12,555
Paper	10,863
Other Fuels	10,000
Limestone	4,871
Others	158,104
Total	**2,118,638**

Source: KRC

5.1.2 Customer Base

The KRC customer base is generally made up of relatively large shippers and customers who move large volumes of single commodity traffic between a limited number of origin - destination pairs. This is an ideal situation for the rail transport mode since it provides the opportunity to run block trains and further improve the efficiencies, improving the advantage over trucks and highways. Following is a description of the major shippers and customers broken out by commodities.

The main cement shippers are: Bamburi Cement which is part of the Lafarge group with its affiliated East African Portland Cement (EAPCC), Hima Cement with its plant in Uganda and Tororo cement located in Tororo and belonging to Corrugated Sheets Ltd of Kenya.

The main container customers are either shipping lines such as Maersk, or Freight Forwarding Agencies such as Freight Forwarders Kenya (FFK), Interfreight, SDV TransAmi and Kenfreight/MSC.

The Maize and Wheat shippers are either trading companies such as Export Trading and Olam, milling companies such as Unga Millers, Mombasa Millers, Premier Mills and Golden Harvest and organizations involved in the imports/exports of cereals. The World Food program and other donor agencies such as ACDI/VOCA and USAid are also major shippers.

The petroleum products shippers are large multinationals such as Kenoil-Kobil, Total, Shell and Caltex.

There are three main importers of vegetable oil: Bidco Oil with a factory in Thika and in Jinja, Uganda, Kapa Industries with its factory in Nairobi and Mukwano Industries located in Kampala.

Coffee exporters from Uganda are Pan Afric Impex, Kawacom, Ugacof, Olam, Kyalaganyi Coffee and Great Lakes Coffee; major coffee exporters in Rwanda are Rawcof, part of the Ugacof/Socafina group, and Rwandex, part of the Drucafé Group which ship via the Northern Corridor.

The Kenya Tea Development Authority (KTDA) markets some 70% of the total tea production in Kenya with a few large scale producers such as Brooke Bond, George Williamson, Eastern Produce and African Highlands handling.

There are 3 major fertilizer importers in Kenya: Yara East Africa Ltd, Devji Meghji & Brothers Ltd and KTDA the remaining.

In addition to soda ash, Magadi Soda also ships salt and receives fuel oil. Kenya Fluorspar Corporation (KFC) ships fluorspar.

5.1.3 Passenger Service

The Kenya concession agreement with RVR stipulates that it must operate the following inter-city and commuter services for a period of five years:

Inter-City:

- Nairobi – Mombasa - Three trains per week per direction
- Nairobi – Kisumu - Three trains per week per direction
- Voi – Taveta - Two trains per week per direction
- Nairobi – Nanyuki - One train per week per direction
- Kisumu – Butere - Three trains per week per direction

Commuter:

- Nairobi – Thika - One train per day per direction
- Nairobi – Kahawa - One train per day per direction
- Nairobi – Embakasi - Two trains per day per direction
- Nairobi – Limuru - One train per day per direction

Historic passenger Handlings:

For the year 2005, KRC transported some 600,000 passengers in its Inter-City services; these numbers are significantly less than the 3 million plus carried in the mid 80's and the 1.7 million carried in the mid 90's before the highways were built and improved and highway transport developed.

KRC carried some 3.6 million passengers in its commuter services during the year 2005, serving the Nairobi area.

RVR has been carrying Inter-City passengers at the yearly level of 540,000 while its commuter handlings have been at the 4.4 million passengers per year based on its first 9 months of operations.

5.2 URC

Although the Uganda Railways Corporation (URC) no longer operates trains, its former rail network basically ran between Kampala and the border with Kenya at Malaba, a distance of 251 kilometres with a 9-kilometer spur going from Kampala to Port Bell where it connected with the ferries that operate on Lake Victoria. While the concession to RVR covers the entire URC network, RVR has not taken over these lines that they consider technically inoperable and not commercially viable. As such, RVR has only taken over the following sections which represent a total length of 337 kms: (a) the 250-km main line from Kampala to Malaba; (b) the 9-km Port Bell spur; (c) the 5-km Kampala-Nalukolongo section of the Kasese line; (d) the 3-km Jinja Pier line; (e) the 15-km Jinja-Kakira section of the Busoga line; and (f) the 55-km Tororo-Mbale section of the Packwach line.

URC also operates two rail ferry routes on Lake Victoria, linking Port Bell with Kisumu in Kenya and Monza in Tanzania. Although URC owned three ferries, which were commissioned between 1983 and 1985, one sank and the remaining two are now out of service pending renovations and safety approvals although some $2M has been granted by the World Bank for this purpose some two years ago.

URC's traffic base is primarily made up of import traffic moving from the Malaba border into Kampala and ferry traffic coming up from Kisumu; Containers represent approximately one third of its traffic, with wheat, maize and other grains representing another third. Coffee exports from Kampala through the port of Mombasa represent most of the outbound traffic.

5.2.1 Freight

The following table shows the traffic handled by URC for the years 1996 to 2002 broken down by traffic type and main Origin-Destination pairs:

Table 5.3: URC Traffic by Traffic Type and Main Origin-Destination Pairs

URC TRAFFIC							
Freight Traffic (Tonnes)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Domestic	**75,855**	**63,175**	**36,099**	**20,288**	**17,673**	**24,171**	**33,628**
Export							
To Kenya - Direct Rail	106,165	35,475	11,820	27,020	13,940	4,909	4,408
To Kenya - Via Lake Victoria	1,290	0	16,170	49,389	65,225	66,703	65,975
To Tanzania - Via Lake Victoria	38,714	39,032	23,494	46,988	27,677	40,006	70,098
Sub-Total	**146,169**	**74,507**	**51,484**	**123,397**	**106,842**	**111,617**	**140,481**
Import							
From Kenya - Direct Rail	373,510	319,461	277,629	250,552	133,559	137,903	229,667
From Kenya - Via Lake Victoria	21,918	1,174	160,789	183,998	350,185	381,034	322,120
From Tanzania - Via Lake Victoria	80,156	98,376	75,184	175,252	190,480	201,573	177,798
Sub-Total	**475,584**	**419,011**	**513,602**	**609,802**	**674,225**	**720,510**	**729,585**
Total	**697,608**	**556,693**	**601,185**	**753,487**	**798,740**	**856,298**	**903,693**
To Kenya	502,883	356,110	466,408	510,959	562,909	590,548	622,170
To Tanzania	118,870	137,408	98,678	222,240	218,157	241,579	247,896

Source: URC

The following table shows the traffic distribution of tonnages by commodity for URC for the fiscal year 2003-04 for traffic interchanged with KRC through Malaba or using the ferry at Kisumu, once again in our opinion, representative of the "good years" of URC:

Table 5.4: URC Traffic by Commodity

URC Traffic (2003-04)	
Commodity	**Tonnes**
Containers	165,000
Wheat	63,314
Grain Other	55,906
Vegetable oil	55,155
Maize	44,549
Cement	25,477
Petroleum	17,127
Coffee	13,308
Salt	11,362
Fertilizer	9,555
Iron and Steel	9,308
Oil Fuel	3,697
Limestone	1,750
Others	7,500
Total	**483,008**

Source: URC

5.2.2 Passenger Service

All passenger services in Uganda have been discontinued since the early 1990's.

5.3 TRC/TRL

The railway network in Tanzania consists of 2,707 route-kilometres of metre-gauge track and 3,083 track-kilometres; it is basically made up of a trunk line from Dar es Salaam north to Tanga and Arusha, a trunk line from Dar es Salaam west to Tabora where it continues west to Kigoma and splits north to Mwanza. There are two short spur lines that serve the cities of Mpanda and Singida and a line between Kilosa and Kidatu, where it links with the TAZARA railway. However, the Kidatu Interchange is no longer operational today. There is also one rail ferry operated on Lake Victoria.

Rites has been awarded the concession of TRC for a 25-year term and started operations on October 1st, 2007, as Tanzania Railways Limited (TRL).

5.3.1 Freight

The Tanzania Railways Limited (TRL) currently operates freight services domestically and for transit traffic to DRC, Rwanda, Burundi and Uganda. It operates between Dar es Salaam, via Dodoma, located some 200 kms west of Dar es Salaam, and Kigoma on the shore of Lake Tanganyika and Mwanza on the southern shore of Lake Victoria. The service to Mwanza is generally referred to as the "Central Corridor".

The handling of domestic traffic to/from the Tanga/Arusha line and Dodoma as well as between Dar es Salaam and Dodoma has been curtailed in the past years primarily because of the shortage of locomotives; shippers have to truck their goods to Dodoma for transhipment into wagons and transport westward.[3]

The Trans Africa Railway Corporation (TARC) also operates freight services on the TRC network; TARC has been granted track access until 2017. TARC is also the sole operator of international transit traffic originating from Southern Africa via the interchange between TRC and TAZARA at Kidatu[4] to Mwanza for furtherance to Uganda via ferry and the dry port at Isaka for furtherance by road to Rwanda and Burundi.

The Marine Services Company Ltd (MSC) operates one ferry on Lake Victoria, the M.V. Umoja, linking Mwanza to Port Bell on the outskirts of Kampala, to Kisumu where it links with the Kenyan railways network and to Kemondo Bay on the western shore of Lake Victoria.

Traffic data for the years 2003 and 2004 are still used as the reference and basis for describing TRL's business since it corresponds to the last "Good Years" of TRC before the operational problems took such dramatic proportions that traffic reduced by half by 2006. Approximately one-third of TRC's 2003 handlings consisted of Transit traffic originating at the port of Dar es Salaam and destined to land locked countries of Uganda, Rwanda, Burundi, RDC and Zambia; the other two thirds of its traffic consisted of Exports, Imports and Domestic traffic.

The patterns of the TRL traffic, which as mentioned earlier has substantially reduced in the past two years have remained somewhat stable with the exception that all domestic traffic on the Tanga/Arusha line is now trucked to Dodoma for further handling by rail westward.

The following table shows the traffic distribution of tonnages by commodity for the TRL network for the years 2003 to 2006:

[3] It is understood that the section between Dar es Salaam and Dodoma is back to operation, though the situation is still reported to be very poor, as of December 2008. This working paper was prepared based on the information provided between September and December 2007, as explained in the introduction chapter of the Final Report, in order to provide necessary inputs for the overall master plan.
[4] Kidatu Interchange is no longer in operation.

Table 5.5: TRL Traffic by Traffic Type and Main Origin-Destination Pairs

TRL FREIGHT TRAFFIC				
	2003	2004	2005	2006
Commodity				
DOMESTIC				
Cement	81,511	97,054	101,624	71,801
Coffee	16,233	17,837	20,500	12,020
Cotton	33,418	19,819	6,006	352
Cotton Cake	25,351	9,005	12,825	2,687
Fertilizer	21,065	28,782	20,093	13,565
General cargo	428,919	348,870	294,105	200,518
Grains	34,149	21,127	20,458	16,328
Gypsum	16,873	6,363	4,183	3,186
livestock	19,405	16,716	14,929	8,013
Maize	48,276	40,204	40,258	56,106
POL	146,422	132,569	126,113	96,146
Salt	31,127	25,243	25,154	13,925
Sugar	45,806	46,763	31,593	17,234
Timber & Logs	13,153	12,501	12,013	5,279
Tobacco & Cig.	21,622	24,530	25,275	10,828
Parcels & Luggage	14,237	11,175	10,143	6,783
TOTAL DOMESTIC	**997,567**	**858,558**	**765,272**	**534,771**
TRANSIT				
POL	31,420	13,877	3,419	378
Transit UP	197,394	213,883	177,981	118,218
Containers	65,013	84,012	67,572	43,824
Sub-Total	293,827	311,772	248,972	162,420
Transit Down	55,937	54,218	36,149	11,096
TOTAL TRANSIT	**349,764**	**365,990**	**285,121**	**173,516**
WFP	95,382	108,701	78,115	66,994
TOTAL TRANSIT & WFP	**445,146**	**474,691**	**363,236**	**240,510**
TOTAL INVOICED	**1,442,713**	**1,333,249**	**1,128,508**	**775,281**
TARC	118,776	111,712	103,100	38,520
TOTAL COMMERCIAL TRAFFIC	**1,561,489**	**1,444,961**	**1,231,608**	**813,801**

Source: TRL

The average leads in 2003 were 971 kilometres for Domestic traffic and 1,175 for Transit traffic averaging out to 1,018 kilometres; the average lead in 2006 reduced to 860 kilometres with the curtailment of domestic freight services in Dar es Salaam and their displacement out to Dodoma.[5] With the increase of locomotives through additions and higher availabilities, Rites will handle traffic from Dar es Salaam and therefore, they should be in a position to recover the lead distances of 2003.

5.3.2 Customer Base

The TRL customer base is made up of relatively large shippers and customers who move large volumes of single commodity traffic between a limited number of origin-destination pairs as is the case in Kenya, again an ideal situation for the rail transport mode since it provides the opportunity to run block trains and deliver efficiencies, further improving the advantage over trucks and highways.

[5] It is understood that the section between Dar es Salaam and Dodoma is back to operation, though the situation is still reported to be very poor, as of December 2008. This working paper was prepared based on the information provided between September and December 2007, as explained in the introduction chapter of the Final Report, in order to provide necessary inputs for the overall master plan.

5.3.3 Passenger Service

Inter-City passenger services serving Dar es Salaam have been operated to/from Dodoma for the past few years similar to the domestic freight traffic because of the unavailability of locomotives. As specified in the concession agreement, Rites must continue to operate these services and bring them back to Dar es Salaam.

Rites must operate the following Inter-City services as far as third class passengers are concerned:

- Four trains per week per direction between Dar es Salaam and Tabora splitting in two trains destined to Kigoma and Mwanza
- One direct train per week per direction between Dar es Salaam and both Kigoma and Mwanza
- One train per week per direction between Tabora and Mpanda
- One train per week per direction between Dodoma and Singida

Rites will operate first and second class coaches on the above mentioned passenger trains in addition to the third class coaches. Following is a summary of data for passenger services on the TRL network for the years 2002 to 2006:

Table 5.6: TRL Passenger Service

	2002	2003	2004	2005	2006
PASSENGERS PER YEAR					
First Class	12,097	11,204	11,179	11,373	9,869
Second Sleeping	48,405	50,531	50,388	50,672	47,505
Second Sitting	9,489	10,599	5,867	4,939	3,958
Third Class	546,618	574,532	508,749	525,018	460,229
Sales onboard	68,187	36,615	51,786	82,027	72,528
TOTAL	**684,796**	**683,481**	**627,969**	**674,029**	**594,089**
PASSENGER-KILOMETERS PER YEAR (000)					
TOTAL	**444,720**	**444,059**	**432,820**	**475,130**	**324,922**
AVERAGE LEAD(Kms)					
	649	**650**	**689**	**705**	**547**

Source: TRL

5.4 TAZARA

TAZARA, the Tanzania - Zambia Railway Authority, operates a cape-gauge line from Dar es Salaam in a southern westerly direction towards Zambia.

TAZARA operates the route from Dar es Salaam to a junction with the Zambian Railways system at Kapiri Mposhi. The line is in good condition but in severe financial difficulties. It is 1,860-km long (of which 975.9 km is in Tanzania) and was built by the Chinese to the Cape gauge of 1,067mm (3ft 6in). With the ending of apartheid there has been renewed

competition from Durban and Port Elizabeth and, in spite of improved quality and service at Dar es Salaam port, there has been a reduction in transit volumes along this corridor.

In 1998/99, TAZARA began securing some additional traffic from South Africa, which is hauled in Trans Africa Railway Corporation (TARC) trains (with TARC locomotives and crew) to Kidatu. Following trans-shipment there to metre-gauge wagons, TARC then operated the trains forward over the TRC system to Mwanza. However, the Kidatu Interchange is no longer in operation and there has been no traffic from South Africa some time. TAZARA also operates passenger services along the corridor.

5.4.1 Freight

From a peak of just over one million tonnes in 1993, TAZARA freight traffic has ranged between 540,000 and 660,000 tonnes per year since 1994. The following table shows detailed data for the years 2000/01 to 2005/06:

Table 5.7: TAZARA Freight Traffic

TAZARA TRAFFIC (Tonnes)						
	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Imports						
Zambia	45,728	79,663	107,591	55,829	90,631	97,145
D.R. Congo	68,515	76,013	68,780	61,581	62,349	66,790
Malawi	11,147	24,900	42,979	35,345	28,743	19,389
Zimbabwe		8,347	2,547			
Tanzania	14,731	6,203	19,675	18,277	45,284	17,124
Subtotal	**140,121**	**195,126**	**241,572**	**171,032**	**227,007**	**200,448**
Exports						
Zambia	156,082	164,682	175,975	196,567	166,819	164,209
S. Africa	17,319	14,826	4,045			
D.R. Congo	17,909			16,664	23,957	42,878
Tanzania	15,062	10,408	15,173	26,698	39,093	43,669
Subtotal	**206,372**	**189,916**	**195,193**	**239,929**	**229,869**	**250,756**
Local						
Tanzania	227,624	155,820	108,615	183,151	161,180	136,298
Zambia	19,652	36,345	68,313	16,168	14,422	13,727
Subtotal	**247,276**	**192,165**	**176,928**	**199,319**	**175,602**	**150,025**
TOTAL	**593,789**	**577,207**	**613,693**	**610,280**	**632,478**	**601,229**

Source: TAZARA

The average lead for TAZARA movements ranges between 1,400 and 1,500 kilometres.

5.4.2 Passenger Service

The TAZARA passenger handlings have been relatively stable for the last 5 years, ranging between 900,000 and 1,000,000 passengers per year.

Table 5.8: TAZARA Passenger Traffic

	2002/03	2003/04	2004/05	2005/06	2006/07
Tanzania					
Passengers per year	702,838	631,048	631,751	596,998	816,709
Net Passenger-Kilometres (000)	117,369	116,840	113,504	118,092	173,525
Zambia					
Passengers per year	347,774	298,090	301,688	292,742	273,650
Net Passenger-Kilometres (000)	113,361	125,493	127,816	180,000	176,187
TOTAL					
Passengers per year	1,050,612	929,138	933,439	889,740	1,090,359
Net Passenger-Kilometres (000)	230,730	242,333	241,320	298,092	349,712

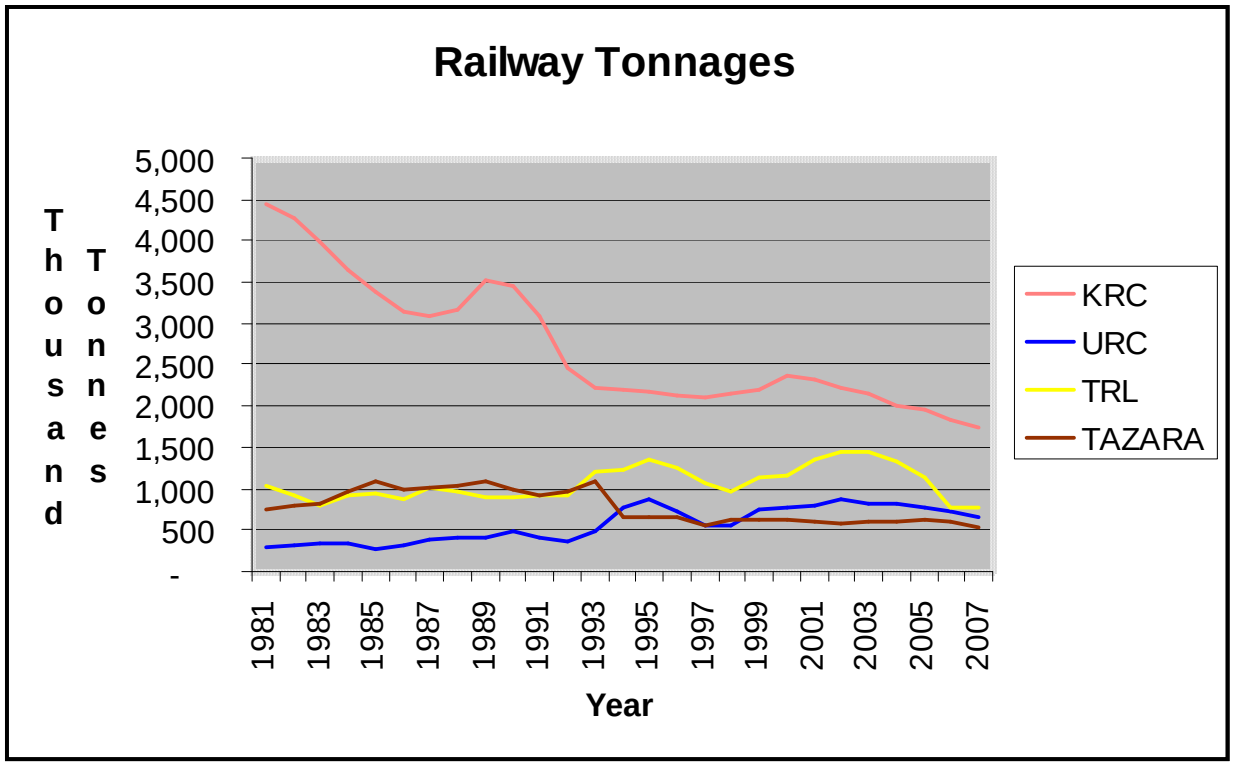
Source: TAZARA

5.5 General Railway Freight Performance

Three railways, KRC, TRL and TAZARA have seen their traffic handlings reduce significantly as they are now carrying roughly some 35% to 50% of their peak handlings while the transport market in their catchment areas has increased significantly, doubling or tripling its volumes; URC has been the most stable most likely as it was in a position to get traffic from either KRC or TRL, whichever performed best, and was relying also on the ferries across Lake Victoria which were not affected as much with deficient operations as were the railways until more recently. The railways' inability to provide equipment and reliable service to shippers and customers has contributed to a significant growth of the trucking activities in the region as they have had to not only to handle the former rail traffic that was not being handled by the railways, but they have also coped with all the traffic growth for those years as well.

The following graph which has been produced using the World Bank database and the latest figures that were made available to us during our mission provides a good overview of the trend for the four railways although the data for some specific years was missing and we have interpolated the numbers in order to produce the graph:

Figure 5.2: Railway Tonnages – Trend



Source: World Bank

KRC's market share of the freight transport market which once exceeded 40% has now been reduced to less than 15%. This pattern happened in many countries once highways were built and truck competition flourished; ineffective and inefficient railway operations run under government control generally contribute to the decline of rail as a key transport mode.

The URC traffic volumes interchanged with KRC at either Malaba or Kisumu have been fluctuating between 500,000 and 600,000 tonnes per year for the past 7 years; they do not show a steady decrease as is the case for KRC although they have been more erratic. This is the result of droughts in the region which have changed the flows of grain movements, ferry unavailability and interrupted service and the uneven performance of the Tanzania railway over the period in question.

TRC carried some 1.44 million tonnes when traffic peaked in 2003. However the inability to provide equipment and reliable service to shippers and customers has contributed to a significant growth of the trucking activities in the region and railway tonnages fell to some 0.75 M tonnes in 2006. TRL's market share has reduced to less than 15% as well as a result of this significant drop in traffic.

There are three main sources of competition to the railways for transport of freight: highways/trucks, water transport and the pipeline; by far, trucks are the main competition for KRC, URC, TRL and TAZARA. KRC also faces additional pipeline competition for white oil products (diesel, gasoline and kerosene); fuel oil cannot be shipped via the pipeline because it would contaminate the white oil products.

Although the rail and truck transport modes have traditionally been competitors, in some cases they have evolved into complementary modes of transport (Isaka dry port for

furtherance to Rwanda for example) similar to the rail and water transport modes (Mwanza by rail to ferry for Kampala and Kisumu by rail for lake transport to Bujumbura).

6 Rail / Truck Transport Comparisons

6.1 Distance comparison for key O-D pairs

The following table compares the distance of travel for the rail and highway modes for key O-D pairs that are being served by the four railways.

KENYA / UGANDA

Although the highway and rail lines are adjacent along most of the network, there are some areas where the rail line follows a more circuitous route which leads to an increased rail distance of as much as 15% between origin and destination for the traffic compared to the highway distance; the following table illustrates these differences for key Origin-Destination pairs:

Table 6.1: Rail vs Highway Distance Comparison

RAIL VS HIGHWAY DISTANCE COMPARISON				
		KILOMETERS		
FROM	TO	HIGHWAY	RAIL	% Rail > Hwy
Mombasa	Voi	157	164	4.5%
Mombasa	Nairobi	487	530	8.8%
Mombasa	Nakuru	643	712	10.7%
Mombasa	Kisumu	830	929	11.9%
Mombasa	Eldoret	797	915	14.8%
Mombasa	Malaba	934	1,082	15.8%
Mombasa	Kampala	1,149	1,333	16.0%

Scandiaconsult - SwedeRail Report 2003

TANZANIA

Although the highway and rail line to Mwanza are adjacent along most of the network, the highway to Kigoma follows a very long circuitous detour north which leads to an increased distance of more than 30% between origin and destination for the traffic; the following table illustrates these differences for key Origin-Destination pairs:

Table 6.2: Rail vs Highway Distance Comparison

RAIL VS HIGHWAY DISTANCE COMPARISON				
		KILOMETERS		
FROM	TO	HIGHWAY	RAIL	% Hwy > Rail
Dar es Salaam	Tabora	1000	840	19.0%
Dar es Salaam	Kigoma	1660	1251	32.7%
Dar es Salaam	Isaka	1000	970	3.1%
Dar es Salaam	Mwanza	1191	1218	-2.2%

Source: TRL & TANROADS

As indicated in the above table, the rail mode benefits from shorter distances for two key destinations, Tabora and Kigoma because the highway alignment is very circuitous for these cities, while for Isaka and Mwanza, the distances are similar.

The rail/ferry route from Dar es Salaam to Port Bell, Kampala, is 1,557 km, 373 km longer than both the rail route from Mombasa, and the shortest road route through Kenya; the rail/road route from Dar es Salaam to Rwanda is 1,512 km, comparable with the road route through Tanzania, but 215 -350 km shorter than the three Kenyan road routes; the rail/lake route from Dar es Salaam to Burundi is 1,430 km, 315-560 km shorter than the road routes through Tanzania and 565-590 km shorter than the Kenyan road routes and the rail/lake route from Dar es Salaam to the DRC is 1,400 km, 325-375 km shorter than the alternative road routes from Mombasa.

6.2 Service Comparison

The service offered by TRC, KRC and URC before being concessioned was woefully inadequate; not only were customers not being provided empty wagons in a timely manner, once loaded, there was also a delay in having the wagons pulled and brought to yards for marshalling. Furthermore, because of the way trains were operated, the wagons ended up waiting in yards along the way to their ultimate destination.

The transit times provided by the railways were not only on average two to three times that of trucks and there were very large variations in transit times from one movement to another; the fact that there was no consistency in service made shippers unable to rely on the railways to get their goods to destination.

We have confirmed with shippers in Kenya and Uganda that if the new concessionaires are successful at improving the transit times and maintain consistency which they should achieve with the introduction of block trains and an efficient operation, most of the shippers are willing and looking forward to moving a good portion of their shipments back to the railway mode.

6.3 Truck Axle Loads and Comparison to Rail Net Tonnes per Wagon

KENYA / UGANDA

Although the highway network is in a constant state of being built and rebuilt, the main highway between Mombasa and Malaba at the border with Uganda can be considered to be in a somewhat fair condition with some stretches being relegated to dirt highway conditions. This has not however hampered the truck competition from expanding and taking a solid root in the economy, basically responding to the need for shippers to get their goods and products moved and the railway's inability to do so.

The Kenya government has decided, most likely further to pressure from financing and donor institutions, to make an effort to preserve its highway network and protect it from destruction by heavy trucks. Effective 1 December 2007, it will ban 4 axle trailers from operating on its highways and the maximum axle weights will be as follows:

Table 6.3: Kenya Maximum Axle Weights

Axle Group	Legal Limit (Kg)
Single Steering Axle	8,000
Single rear axle	10,000
Tandem rear axle	16,000
Triple rear axle	24,000

Source: Kenya Roads Board

The following table details the latest maximum permissible highway gross weights in Kenya for various combinations:

Table 6.4: Kenya Maximum Gross Vehicle Weight

Maximum Gross Vehicle Weight (GVW)	
Vehicle Type	**Legal Limit (Kg)**
a) Vehicle with two axles	16,000
b) vehicle with three axles	22,000
c) vehicle and semi-trailer with total of three axles	26,000
d) vehicle and semi-trailer with total of four axles	34,000
e) vehicle and semi-trailer with total of five axles	40,000
f) vehicle and semi-trailer with total of six axles	46,000
g) vehicle and drawbar trailer with total of four axles	34,000
h) vehicle and drawbar trailer with total of five axles	40,000
i) vehicle and drawbar trailer with total of six axles	46,000

Source: Kenya Roads Board

The standard maximum payload capacity that one highway tractor/trailer can carry is basically 32 tonnes, or approximately 70,000 pounds and the Kenya Roads Board operates both permanent and mobile weighbridges to monitor trucks weights and distribution on axles; a few shippers have however mentioned that the control system is not very effective and that some trucks are known to operate with as much as 30% to 40% excess weight. While this would explain why the highways are constantly deteriorating and in bad condition, hopefully the recent announcements about enforcing the maximum axle and GVW limits should help reducing the overloads.

With most of the current average payloads of the KRC railway wagons ranging between 36 and 40 tonnes, the railways are only enjoying a 25% payload advantage at best.

TANZANIA

Tanzania's TANROADS organization has strong political support for enforcing the country's 10 tonne maximum limit on axle loads; this is much less than the 12 tonne per axle load allowed in Kenya but is aimed at ensuring that the investments in the highway network are not destroyed by heavy trucks. The following table details the latest maximum permissible loads per axle or axle group in Tanzania:

Table 6.5: Tanzania Maximum Loads per Axle

MAXIMUM LOADS PER AXLE		
Type of axle/group of axles	**No. of tyres**	**Max load on axle/group of axles**
a. Single steering drive operated	2	8
b. Two steering drive operated	4	14
c. Single steering draw bar controlled	4	9
d. Single non steering	2	8
e. Single non steering	4	10
f. Tandem non steering	4	12
g. Tandem non steering	6	15
h. Tandem non steering	8	18
i. Tandem steering (dolly)	8	16
j. Triple non steering	10	21
k. Triple non steering	12	24
l. Triple super single tires	6	24

Source: TANROADS

The following table lists the maximum gross vehicle weights for most vehicle combinations:

Table 6.6: Tanzania Maximum Gross Vehicle Mass

Maximum Gross Vehicle Mass		
	Vehicle Description	**Maximum Gross Vehicle Mass (KGs)**
A	Two axle vehicle	18,000
B	Three axle vehicle	26,000
C	Four (or more) axle vehicle	28,000
D	Vehicle plus semi-trailer with 3-axles	28,000
E	Vehicle plus semi-trailer with 4-axles	36,000
F	Vehicle plus semi-trailer with 5-axles	44,000
G	Vehicle plus semi-trailer with 6-axles	50,000
H	Vehicle and draw-bar trailer with 4-axles	37,000
I	Vehicle and draw-bar trailer with 5-axles	45,000
J	Vehicle and draw-bar trailer with 6-axles	53,000
K	Vehicle and draw-bar trailer with 7-axles	56,000

Source: TANROADS

It is important to note that the key difference between the Kenya and Tanzania maximum axle weights pertain to that of the tandem non-steering axle with 8 tires; while Kenya adheres to the COMESA standards which only allow a maximum of 16 tonnes per tandem non-steering axle, Tanzania which while being a member of COMESA is also a member of SADC has decided to adhere to the SADC guideline because of its dealings with South Africa and allows a maximum 18 tonnes for the same tandem non-steering axle. This is creating some conflicts within the EAC and meetings are being held to resolve the issue.

However, the most common tractor/trailer combination in use in the EAC as far as railway competition is concerned is the triple non-steering axle on trailers and for this type of trailer,

the maximum axle load is the same in all the EAC at 24 tonnes. This will allow a GVW of 50 tonnes and result in a maximum payload of some 32 tonnes or 70,000 pounds as mentioned earlier. TANROADS operates both permanent and mobile weighbridges to monitor trucks weights and distribution on axles.

With most of the current average payloads of the railway wagons ranging between 35 to 40 tonnes, the railways enjoy a 25% advantage as far as payload is concerned compared to trucks.

6.4 Prices/Tariffs

Prior to June 2005 when KRC rates were increased by as much as 30%, it was generally recognized and accepted that rail rates were significantly lower than the prevailing truck rates; however, with the June 2005 increase, rail rates are now believed to generally be just slightly lower than those of trucks

We understand that RVR was contemplating increasing its rates by 10% effective November 1st 2007 and believe that this will not cause pressure on market share as we would anticipate that the truck operators will take this opportunity to also raise their tariffs by 10%, especially given the rising fuel costs they have to contend with.

While there is a significant number of trucks operating on the highways and while there is competition between them, the current transport rates in Kenya and Uganda are higher than average world prices for similar services. The average KRC revenue per tonne-km is some 4.6 cents US excluding the Magadi soda ash traffic; this is much higher than other world prices. We believe that these higher transport rates are a result of the fact that the domestic and trans-border transport market of Kenya has been growing steadily over the past five years at an annual average rate of some 7.5% while the supply by the railway and trucks has not kept pace with this demand. Increasing trans-border transport requirements into Uganda, Southern Sudan and other long distance trucking areas have also contributed to this situation.

The current average URC revenue per tonne-km is above 8 cents US, almost double that of KRC. While there are fewer trucks in Uganda compared to Kenya and the Uganda highway conditions are not as good, we do not believe that these rate levels are sustainable in the longer term as increased competition comes into play.

Prior to June 2007 when TRL rates were increased by some 20%, it was generally recognized and accepted that rail rates which averaged some 4.5 cents US per tonne-km were significantly lower than the prevailing truck rates, as much as twice less than certain truck per tonne rates; we do not believe that the June 2007 increase changed this relative balance between rail and trucks although it was not well received by shippers given the very bad service offered by TRL. With the June 2007 TRL increase, we will assume that the 2007 average revenue per tonne-Km is now at some 5.4 cents US.

The following tables compares rail and truck rates for key Origin - Destination pairs for the UP direction for General Goods cargo loaded at 32 tonnes per highway trailer and at 35 tonnes per rail wagon at the new TRC tariff levels of June 1st, 2007 after the 20% increase:

Table 6.7: Rail vs Truck Rate Comparison

RAIL VS TRUCK RATE COMPARISON				
		Rate per Tonne ($US)		
FROM	TO	TRUCK	RAIL	Truck / Rail
Dar es Salaam	Kigoma	150	65	231%
Dar es Salaam	Isaka	100	54	184%
Dar es Salaam	Mwanza	120	63	189%

Source: Various Shippers and TRC

The TRL rates are much lower than the corresponding truck rates, notably to Kigoma because of the highway's circuity; truck rates per tonne are some two to two and half times greater. While one needs to take into account the origin and destination trucking costs associated with the rail movement for customers who do not have private sidings, it is obvious, as stated by most customers that we interviewed, that rail rates are much lower and that the concessionaire will have room to implement real rate increases once it improves service.

6.5 Truck Profit Margins

We have made a cursory review of the current profit margins of trucking firms operating in the Mombasa / Kampala, Dar es Salaam / Mwanza and Dar es Salaam / Isaka corridors in order to determine how much room they currently have to reduce prices if they wanted to avoid losing market share to the new railway concessionaires. From our research and discussions with shippers and forwarders, some of which operate their own fleets, we have established that truck operators are currently averaging net profit margins in the 20% range.

We have compared Canadian truck rates for a 32 tonne shipment between Toronto and Montreal, a distance of some 500 kilometres on a relatively flat terrain with a good 4 lane highway which requires approximately 6 hours of driving between shipper and consignee docks; the rates are approximately US$ 600 per one way trip for a round trip revenue of US$1,200 or US$ 1.20 per truck-kilometre for loaded moves in each direction.

The current going truck rates for a return Load/Empty trip for 2 TEUs between Mombasa and Nairobi is in the US$ 1,400 range while it is in the order of US $2,600 return to Kisumu and in the order of US$ 3,400 return to Kampala. These rates convert to US$ 1.40 to US$ 1.50 per truck-kilometre and excluding the highway toll charges, to some US$ 1.25 to US$ 1.40 per truck-kilometre.

Comparing the various operating cost elements of trucks in Canada and the EAC, fuel cost per litre are similar, fuel consumption in the EAC should be somewhat greater because of the grades and road conditions, truck ownership costs are comparable, parts should be higher in the EAC given the bad highway conditions and the mechanics and driver wages are much less in the EAC, even when factoring in the fact that the driving time is about twice that of Canada. The bottom line is that total truck operating costs in Kenya should be somewhat lower per truck-kilometre than those of Canada; they are actually in the order of 15% to 20% higher which suggests that the trucks have room to reduce rates in order to avoid losing market share to the railways. Our experience indicates that this will most likely gradually happen as railway service improves and railways start regaining market share, but it will be a slow process given that the truckers have some 85% market share, every shilling of rate reduction is a shilling of profit reduction and truckers will hold off as long as they are

not convinced that the railways can perform and that customers will actually move business back to the rails.

Truckers would stand to lose a great deal by indicating to shippers that they can reduce rates and they would expose themselves to a potential attrition of their entire revenue base. We believe the new concessionaires will require some time to improve the service and that truckers will adopt a wait and see attitude before reducing rates and that depending on the rate at which the concessionaires regain market share, truckers will not start a price war but will rather increase their rates more slowly.

The truck operators that serve Rwanda, Burundi and Uganda are those who are generally based in Kenya and Tanzania and our analysis and conclusions on truck competitiveness also applies to these countries.

7 Review of Previous Studies

7.1 Introduction

This chapter presents our analysis of previous studies of railway traffic forecasts in the catchment area of the East African Railways.

7.2 Scandiaconsult – SwedeRail: Final Technical and Commercial Assessment Report (April 2003)

This extensive and detailed report published in early 2003 concluded that there was significant growth potential for the Kenya railway under two scenarios: Basic and Optimistic.

The estimated tonnages for the year 2003 at the time the study was conducted were at the 2.275 M-tonne level; following are the annual tonnages forecasted at that time for the years 2005, 2010, 2015 and 2020 under both scenarios:

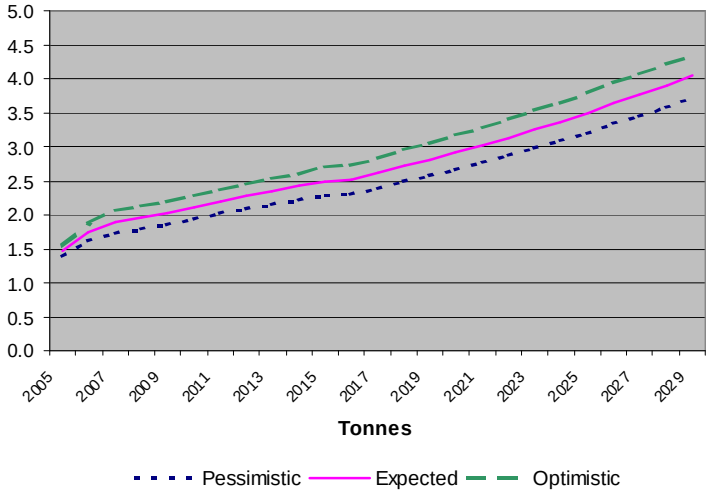
Table 7.1: Scandiaconsult-SwedeRail Forecasts of KRC Traffic

	Forecast in Million Tonnes			
	2005	**2010**	**2015**	**2020**
Basic	2.89	3.82	4.34	4.96
Optimistic	3.33	5.12	6.22	7.60

7.3 CPCS Transcom's Interim Report on the Market Study and Financial Modelling (15 Nov. 2004)

This study reviewed in detail the different markets and commodities available to TRC and established projected traffic levels from 2005 to 2030 under three scenarios: Pessimistic, Expected and Optimistic.

Figure 7.1: CPCS Forecasts of TRC Traffic



According to this study, annual traffic volumes in the year 2030 would reach levels ranging from 3.8 to 4.5 million tonnes per year.

7.4 KPA and TPA Forecasts

The port authorities of Kenya and Tanzania have either conducted or commissioned detailed market studies in order to develop their port master plans. The execution of port expansions require significant lead times given the scope of works required to add new berths and supporting dock areas.

In December 2004, the port of Mombasa was planning on increasing its annual container throughput from its 2006 forecast of 550,000 TEUs to some 1,900,000 TEUs by 2028, an average annual increase of 5.8 % under its base case scenario. As far as port total tonnages are concerned, it was forecasting growing from 13.7 million tonnes in 2006 to some 31.1 million tonnes in 2028, an average annual growth rate of 3.8 % over the 22 year period.

Similarly, the port of Dar es Salaam is forecasting growing its container throughput from 308,000 TEUs in 2006 to 2,238,000 TEUs in 2025, an average annual increase of 11%.

We believe that the Kenya port authority's forecasts are somewhat conservative as they have been based exclusively on conservative population and GDP forecasts for Kenya and the surrounding countries. We believe that they have not fully taken into account the significantly higher potential growth of surrounding countries, namely the CBRU countries.

The forecasts of both port authorities nevertheless support significant potential growth for the railways serving them.

8 Assumptions for Forecast Scenarios

We have elected to forecast the potential freight revenues, in CONSTANT 2007 US dollars, without inflation using three scenarios:

- **HIGH** Scenario
- **BASE CASE** Scenario
- **LOW** Scenario

The BASE CASE scenario has been developed using assumptions that we believe are the most likely to materialize for the various inputs to the forecasts.

The LOW scenario has been developed using conservative assumptions for traffic growth and market share shift from road to rail with a minimal rate attrition resulting from a limited reaction from trucking firms.

The HIGH scenario assumes a more aggressive market share shift from road to rail and a bigger pressure on the rate structure as the result of a stronger reaction from the trucking firms as well as stronger GDP growth.

8.1 Assumptions for HIGH, BASE CASE and LOW Scenarios

In preparing the forecasts for the years 2008 to 2030, we have used as a starting point the estimated 2007 tonnages for KRC, URC and TRL which we developed using the 2006/07 actual tonnages for KRC and URC and the 2006 tonnages for TRL. We have also used estimated average revenues per net tonne-km based on the revenue levels in effect at the beginning of November 2007 and average hauls for each railway based on its historical traffic mix.

While we understand that the market forces and competition at play will undoubtedly influence the traffic mix and have an impact on the average revenue per net tonne-km and average haul, we believe that given the fairly consistent long haul nature of most commodities being handled by the railways and the relatively narrow range of tariff fluctuations, our methodology and assumptions will provide realistic estimates of the potential outcomes.

Following is a description of the assumptions supporting the freight forecasts for the HIGH, BASE CASE and LOW Scenarios.

8.2 Base Tonnages

For KRC and URC, we have based our estimates of the 2007 tonnages that we will use to forecast the years 2008-2030 on the RVR actual tonnages for their first 11 months of operations; for TRL, we have assumed that their 2006 figures were representative of the year 2007.

Following are the 2007 base annual tonnages used for our revenue forecasts:

URC: 660,000 tonnes

KRC: 1,740,000 tonnes

TRL: 780,000 tonnes

The base tonnages as well as assumptions for TAZARA are presented in Section 8.6.

8.3 Growth

Given the concessioning processes undertaken in Kenya, Uganda and Tanzania and the traffic growth targets that have been agreed to by the concessionaires, one would normally expect very rapid traffic growth in the initial years of the concessions. Furthermore, given the fact that the TRL traffic volumes have almost been reduced in half between 2003 and 2006 because of operating deficiencies provides the concessionaire with an opportunity to grow the traffic at very high rates in the first years by introducing additional locomotives, hence overcoming the shortage of motive power which was the main reason for the traffic reductions.

We have however observed during our visits that RVR has for all intents and purposes maintained the pre-concession traffic levels in its first 11 months of operations and will likely not meet the concession target volumes.

We have nevertheless provided for high growth rates for the first three years of operations under concessionaire management for KRC and URC and have been even more aggressive as far as the first years of operations of TRL. While these growth rates might not be considered sufficiently aggressive in some circles, it is our opinion that they are nevertheless realistic.

Following are the assumed Kenya, Uganda and Tanzania GDP growth factors and corresponding Freight Growth factors we used in preparing the forecasts for KRC, URC and TRL:

Table 8.1: Traffic Growth Scenario Assumptions for KRC and URC

Years	1 to 3	4 to 10	11 to 15	16 to 23
KENYA / UGANDA				
LOW				
• GDP Growth	5%	4%	3%	3%
• KRC/URC Growth	6%	5%	4%	4%
BASE CASE				
• GDP Growth	6%	5%	4%	3.5%
• KRC/URC Growth	7.5%	6%	5%	4.5%
HIGH				
• GDP Growth	7%	6%	5%	4%
• KRC/URC Growth	9%	7%	6%	5%
TANZANIA				
LOW				
• GDP Growth	5%	4%	3%	3%
• TRC Growth	7 to 9%	5%	4%	4%
BASE CASE				
• GDP Growth	6%	5%	4%	3.5%
• TRC Growth	8 to 10%	6%	5%	4.5%
HIGH				
• GDP Growth	7%	6%	5%	4%
• TRC Growth	9 to 11%	7%	6%	5%

In addition to the normal longer term growth of the transport market which is reflected in the forecasts as a result of the above growth factors, we have looked at specific blocks of business that the railways could recapture from trucks; those tonnages are described in detail in the next chapter.

8.4 Average Haul

The average haul of the KRC railway was 716 kilometres for the 11 months of RVR operations including the shorter haul traffic of Magadi Soda (457 kms.) and 770 Kms excluding the Magadi Soda traffic, while it was 227 kilometres for URC.

As far as TRL is concerned, it was 879 kilometres based on the 2005 operating results published in the annual report of TRL; however this average lead reflects the fact that TRC is not operating its domestic freight business between Dar es Salaam and Dodoma[6] and we believe that as the concessionaire brings the operations back into service, the average leads

[6] It is understood that the section between Dar es Salaam and Dodoma is back to operation, though the situation is still reported to be very poor, as of December 2008. This working paper was prepared based on the information provided between September and December 2007, as explained in the introduction chapter of the Final Report, in order to provide necessary inputs for the overall master plan.

for TRL traffic will return to their historic levels just above the 1,000 km mark. We have therefore used an average haul distance of 950 kms for the year 2008 and 1025 kms for the balance of our forecasts.

While a faster growing transit market compared to that of the Import or Export markets would tend to increase the average haul, we have chosen at this stage of the study and given the level of detailed information available to maintain the average haul constant for the purpose of estimating revenues. This means that our revenue estimates are conservative.

8.5 Average Revenue per Net Tonne-km

The average revenue per net tonne-km for RVR's first eleven months of operations was US$ 0.089 for URC and US$ 0.042 for KRC including the revenue for Magadi Soda. We have increased these revenues by the 10% increase that was implemented by RVR on 1 November 2007 and have used US$ 0.098 per net tonne-km for URC and US$ 0.046 per net tonne-km for URC as the base for estimating the revenues.

As far as TRL is concerned. the revenue per net tonne-km was US$ 0.045 based on TRC's 2005 annual report. We have increased this revenue by the 20% increase of tariffs that took place on 1 June 2007 and have used US$ 0.054 per net tonne-km as the base for estimating revenues.

As mentioned earlier, we have assumed that the effective average revenues per net tonne-km will vary over time to reflect:

- trucking companies' reaction to RVR increasing its market share and as a reaction to an increasingly favourable opinion of RVR's and Rites' improvements in service; we however believe that trucks have too big a market share currently to start reducing rates because of the substantial potential attrition that their net bottom lines would incur. Such actions may be delayed for many years if they are ever taken; the RVR November 2007 increase will provide enlightenment on this matter: if they follow and also implement a 10% increase, this will set the stage for continued high rates.

- contracts with shippers who will require rate concessions in exchange for committing volumes

- shipper investments required to accommodate larger volumes handled by rail (i.e.: the annual 600,000 tonnes of clinker moving between Mombasa and Athi River)

- the required pick-up and/or delivery activities related to rail movements when there are no private sidings available to either the shipper or consignee of the traffic

Under the LOW Scenario, we have assumed that the current average revenues per net tonne-km in effect in Kenya and Tanzania would actually grow in real terms at 2% per year for years 5 to 10 and 1% per year for years 11 to 15 once service levels warrant it, given the fact they are currently much lower than those of trucks; in Uganda, we have assumed that they would reduce by 5% per year for years 2 to 5. We have not assumed any further changes in real terms for the balance of the planning period and have forecasted revenues in Constant 2007 US dollars, assuming that only inflation would be added to the rates.

As far as the BASE CASE Scenario is concerned, we do not anticipate price reaction from truckers that would warrant price reductions by the railways. We have again assumed real price increases of 2% per year for years 5 to 10 and 1% per year for years 11 to 15 for Kenya and Tanzania while in Uganda, we have assumed a 7.5% per year reduction for years 2 to 5.

Under the HIGH Scenario where we anticipate a reaction by trucking companies to the fact that the concessionaires will grow their business by regaining more market share, we have assumed that rail rates would only increase in real terms in Kenya and Tanzania by 1% per year for years 5 to 15 while in Uganda, we have assumed a 10% per year reduction for years 2 to 5.

The larger rate reductions assumptions for Uganda compared to those of Kenya and Tanzania reflect the fact that with RVR integrating its operations and running through to Kampala and eventually most likely publishing through rates, there will be increasing pressure by shippers to bring the Uganda rates per net tonne-km closer to those of Kenya; while RVR will find arguments for refraining to do this, they will eventually have to make concessions to shippers, especially once their operating costs in Uganda actually reduce.

The following table shows the current and year 5 effective average rates in US cents per net tonne-km for Kenya, Uganda and Tanzania under the HIGH, BASE CASE and LOW Scenarios:

Table 8.2: Assumed Freight Rail Rates (US cents per net tonne-km)

	Current	Year 5	Year 10	Year 15
Kenya				
• LOW	4.6	4.7	5.2	5.4
• BASE CASE	4.6	4.7	5.2	5.4
• HIGH	4.6	4.65	4.9	5.1
Uganda				
• LOW	9.8	8.0	8.0	8.0
• BASE CASE	9.8	7.2	7.2	7.2
• HIGH	9.8	6.4	6.4	6.4
Tanzania				
• LOW	5.4	5.5	6.1	6.4
• BASE CASE	5.4	5.5	6.1	6.4
• HIGH	5.4	5.5	5.7	6.0

8.6 Assumptions for TAZARA

We initially used a more basic methodology to forecast the Tazara traffic than the one used for KRC, URC and TRL because we did not have the time in our initial mandate to review its markets and customer base to the same degree as we did for the other railways and did not have sufficient detailed and historical data to forecast revenues. We have since been provided with historical data and have forecast Net T/KMs and Revenues similar to KRC, URC and TRL.

The TAZARA management indicated their objective was to increase their freight traffic handlings from the current **540,000 tonnes per year** (2007 Base Tonnage) range to 800,000 tonnes per year over the next 5 years. This would correspond to a compound 8.15% per year average increase. We believe that this is feasible since the main barrier to handling additional tonnages is the fact that TAZARA does not have sufficient motive power and that this problem could be overcome by leasing additional locomotives.

We have therefore used this 800,000 tonne target as the basis for elaborating a BASE CASE Scenario for TAZARA and have developed our initial tonnage forecasts for the HIGH and LOW Scenarios by adjusting the growth rates as follows:

Table 8.3: Growth Scenario Assumptions for TAZARA

Years	1 to 5	6 to 10	11 to 15	16 to 23
LOW				
• Annual Growth	8%	6%	5%	4%
BASE CASE				
• Annual Growth	9%	7%	5.5%	4.5%
HIGH				
• Annual Growth	10%	8%	6%	5%

We believe that these growth rates yield tonnage forecasts that fairly represent the likely outcomes for TAZARA at this point in time.

As far as TAZARA's average lead is concerned, it has been relatively stable at 1,550 to 1,600 kms for imports and 1,700 to 1,900 kms for exports for the past 5 years while for domestic traffic it was generally 600 to 900 kms except for the year 2004-05. The overall average lead has been between 1,400 and 1,500 kms and we have elected to use the 2006-07 lead of 1,472 kms to forecast Net T/Kms.

As far as revenues are concerned, the average TAZARA revenue per net T/Km for 2006-07 was US 3.5 cents. While this figure is somewhat low in comparison to the revenues of KRC, TRL and URC; we have nevertheless used it as the basis for our forecasts.

While it is likely that marine competition is at play for some of the TAZARA traffic and exerts a downward pressure on rates, one would need to conduct a detailed review of TAZARA's traffic and customer base and assess competition in order to determine the potential for increasing its revenue per net T/Km.

9 New Initiatives and Potential Tonnages for KRC, URC and TRL

9.1 KRC/URC

We have estimated the yearly Additional Specific Commodity Tonnages for both KRC and URC that will be available for the rail mode once service has been improved by the concessionaires:

- **Soda ash:**
  We have assumed that Magadi Soda would increase its soda ash tonnages by 300,000 tonnes per year when its plant expansion is completed mid 2008: we have therefore assumed a 6 month increase of 150,000 tonnes for Year 1 and a second 150,000 tonne increase for Year 2.

- **Clinker:**
  Bamburi Cement is currently moving some 600,000 tonnes per year of clinker almost exclusively by truck between Mombasa and Athi River; they are most anxious to implement efficient loading and unloading facilities to move this traffic by rail. We have assumed that under the HIGH, BASE CASE and LOW scenarios, respectively 80%, 65% and 50% of this traffic or 480,000, 390,000 and 300,000 tonnes would switch to rail over a 3 year period, from Years 2 to 4.

- **Containers:**
  We assumed that under the HIGH scenario, that KRC would handle 600,000 tonnes additional traffic spread over Years 2 to 5 with 50% of this tonnage or 300,000 tonnes continuing into Uganda. Under the BASE and LOW scenarios, we assumed 400,000 and 200,000 tonnes for KRC and again 50% or 200,000 and 100,000 tonnes for URC, both spread over the Years 2 to 4 and 2 and 3 respectively. The standard growth rates described in the assumptions would then continue beyond the years with specific tonnages.

- **Wheat:**
  The World Food Program indicated that there was a minimum of 200,000 tonnes additional traffic per year of wheat moving from Mombasa to Kampala and the rail rates are lower than those of trucks. We have under the HIGH, BASE and LOW scenarios assumed that both KRC and URC would handle 200,000, 150,000 and 100,000 tonnes respectively split in Years 2 and 3.

- **Cement:**
  The cement production capacity in Kenya which was 1.8 M tonnes per year was increased by 250,000 tonnes per year at the end of 2006. We have assumed that under the HIGH scenario, RVR could increase its current handlings of cement for both KRC and URC over years 2 and 3 by adding 140,000 and 90,000 tonnes respectively; for the BASE and LOW scenarios, these increases would be 110,000 / 60,000 tonnes and 70,000 / 40,000 tonnes respectively in Years 2 and 3.

- **Fuel Oil:**
  We have assumed that under the HIGH scenario, KRC and URC would handle an additional 120,000 tonnes and 60,000 tonnes respectively split between Years 2 and

3 while for the BASE scenario, the tonnages would be 100,000 and 50,000 tonnes and for the LOW scenario, the tonnages would be 80,000 and 40,000 tonnes.

- **Petroleum Products:**
  We have assumed that under the HIGH scenario, KRC and URC would handle an additional 120,000 tonnes and 30,000 tonnes respectively split between Years 2, 3 and 4 while for the BASE scenario, they would be 100,000 and 25,000 tonnes again over years 2, 3 and 4 while for the LOW scenario, the tonnages would be 60,000 and 15,000 tonnes split between Years 2 and 3.

- **Fertilizers:**
  The fertilizers consumed in Kenya and Uganda are all imported. We have assumed that under the HIGH scenario, the increase would be 80,000 and 30,000 tonnes over years 2,3 and 4; for the BASE scenario, it would be 60,000 and 20,000 tonnes and for the LOW scenario, 40,000 and 10,000 tonnes respectively in Years 2, 3 and 4.

  The following table provides a summary of the specific commodity increases for each of the 5 first years:

Table 9.1: Forecast of Additional Traffic for Kenya/Uganda (in 000 tonnes)

Annual additional tonnes (000)						
		Year 1	Year 2	Year 3	Year 4	Year 5
Kenya						
	HIGH	150	757	607	377	150
	BASE	150	613	463	283	100
	LOW	150	468	318	163	50
Uganda						
	HIGH		270	270	95	75
	BASE		195	195	65	50
	LOW		126	126	28	25

9.2 TRL

The significant drop in traffic on the TRL network from 2003 to 2006, when traffic handlings were basically reduced in half and resulted in a loss of some 700,000 tonnes of traffic while the total market has been growing, has provided the new concessionaire with the opportunity to recapture significant market share tonnages in the initial years of its operations.

Our review and analysis has confirmed that the potential traffic for TRL is significant if the railway gets its act together and prices right. We also understand that shippers are looking forward to doing business with the new railway concessionaire and starting to move more business by rail. They naturally expect a more competitive environment between the rail and highway modes once the railway operates efficiently and as was demonstrated earlier, costs for moving their goods by rail are much less than those of trucks.

We have estimated the market share gains that can be achieved by working with shippers and switching larger blocks of traffic from road to rail. We have assumed that beginning in

year 2 of the concession, we expect the concessionaire to be in a position, after securing additional locomotives, having rehabilitated some wagons, having changed operating policies, having started to improve track condition and train speeds and having made the operations more reliable and consistent, to start recapturing market share previously lost to trucks and to capture a greater portion of the traffic growth. We have reviewed key commodities of TRL's traffic base:

- **Petroleum Products:**
  Domestic petroleum products were the single largest commodity carried on the TRL network in 2003 at 152,000 tonnes, representing some 15% of the domestic traffic while in 2006, they fell to 96,000 tonnes but still represented 18% of domestic traffic.

  There is currently significant traffic moving by truck because or TRL's inability to offer service. The potential for the concessionaire to quadruple its handlings to 400,000 tonnes in year 5 by offering reliable and consistent service is within reach; these gains would be a market share recovery from trucks. Furthermore, there is increased domestic consumption notably in Mwanza as a result of the population and construction growth in the area in addition to new potential mines which will require very important quantities of petroleum products for their operations.

  For the HIGH scenario, we have assumed an increase of 300,000 tonnes per year spread over the years 2 to 5, while we have assumed 300,000 and 200,000 tonnes per year for the BASE CASE and LOW scenarios respectively.

- **Pozzolana:**
  Tanga Cement is currently trucking two thirds of its pozzolana requirements into its facility because of unavailability of service and its requirements will double when they expand their plant. There is potential additional rail traffic of 40,000 tonnes per month or some 500,000 tonnes per year.

  For the HIGH scenario, we have assumed 300,000 tonnes per year over the years 3 to 5 while assuming 225,000 and 150,000 tonnes per year for the BASE CASE and LOW scenarios respectively.

- **Containers:**
  As mentioned previously, the container growth in the Port of Dar es Salaam has been impressive at some 16% per year compounded from 2000-01 to 2004-05 while transit traffic to the land locked countries of Zambia, DRC, Burundi, Rwanda, Malawi and Uganda via the port of Dar es Salaam have grown at 29% per year for the past 2 years. Forecasts call for continued growth ranging between 10% to 15% per year for the foreseeable future. This growth is not only fuelled by the Tanzania markets, but also by the economies of the neighbouring land locked countries of Uganda, Rwanda, Burundi, DRC and Zambia.

  There is potential for the concessionaire to carry additional containerized transit cargo if they improve service. This assertion is supported by the fact that TRC handled only some 98,000 tonnes of transit traffic to DRC, Burundi, Rwanda and Uganda in 2006, countries for which it has the best and least costly route, out of a total of some 418,000 tonnes. We have assumed 200,000 tonnes per year for the HIGH scenario spread over the years 2 to 5 and respectively 150,000 and 100,000 tonnes per year for the BASE CASE and LOW scenarios.

Similarly, TRL's handlings of dry cargo from the Port of Dar es Salaam have reduced some 100,000 tonnes per year for 2007 compared to the 185,000 tonnes it handled in 2005 although the port volumes have increased by 25%. We have therefore assumed that for the HIGH scenario, TRC would handle 100,000 additional tonnes per year spread over the years 2 to 5 while for the BASE CASE and LOW scenarios, they would handle 75,000 and 50,000 tonnes per year respectively.

- **Wheat:**
  There is potential to add some 200,000 tonnes per year, and possibly more, of relief cargo on the railway from Dar es Salaam for Tanzania destinations, Burundi and DRC and possibly Rwanda. Rail is the lowest cost and most efficient means of transport since it is more direct and quicker when it operates properly. For transit traffic to Kampala, the rates are lower than those through the port Mombasa. There is also the potential to ship an additional 250,000 tonnes per year of wheat via the railway if it had the capacity to do so.

  We have therefore assumed 400,000 tonnes per year of additional traffic spread over the years 2 to 5 for the HIGH scenario while for the BASE CASE and LOW scenarios, we have assumed 300,000 and 200,000 tonnes per year respectively.

- **Cement:**
  The cement consumption of cement in Tanzania is 39 kilograms per capita compared to Ghana's 150 kilograms per capita. Forecasts call for consumption of 60 kilograms per capita for Tanzania in 5 years. Both the Tanga and Twiga cement factories will be doubling the capacity of their current plants of 650,000 - 750,000 to 1.5 million tonnes per year by 2009.

  The current carrying capacity shortfall of TRC for cement is estimated at some 300,000 tonnes per year for both suppliers and with their plant expansions, it is expected that an additional 600,000 tonnes per year would be rail competitive, for a total additional market potential of 900,000 tonnes per year; this is more than the total traffic handled by TRC in 2006!

  We have assumed 700,000 additional tonnes per year for the HIGH scenario spread over years 2 to 7, and for the BASE CASE and LOW scenarios, 500,000 and 300,000 tonnes per year respectively, again spread over years 2 to 7.

- **New Mining Projects:**
  Mining projects are most interesting for the concessionaire as they would normally provide additional tonnages in the DOWN direction which is the backhaul direction without creating the need for additional trains since there are a lot of empty wagons coming south for repositioning.

  There are two to three mining projects that are being studied and planned that could bring additional business to the railway.

  The first one is referred to as the Kabanga nickel mine and would use the railway from Isaka to Dar es Salaam to export its concentrate for further processing. The anticipated volumes are in the order of 350,000 tonnes per year with an horizon of 2012-2013. The second one is a Soda Ash mine west of Arusha in the Lake Matron area that would use the railway to export through the port of Tanga; anticipated

volumes are some one million tonnes per year. The third one is less advanced in its studies; it is a potential platinum mine south of Kigoma.

We have not included any of the new mines' potential traffic in our forecasts which can be characterized as conservative.

The following table summarizes the Additional Specific Commodity Tonnages that we have included in our forecasts:

Table 9.2: Forecast of Additional Traffic for Tanzania (in 000 tonnes)

Annual additional tonnes (000)								
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Tanzania								
	HIGH		350	475	475	475	125	100
	BASE		258	333	358	348	75	75
	LOW		162	212	212	212	50	50

10 Forecasts (Tonnes, GT-Kms, Revenues)

Appendix A1 details the forecasted tonnages, net tonne-kms and revenues for KRC, URC and TRL for the HIGH, BASE CASE and LOW Scenarios for the period 2008 to 2030 as well as the TAZARA forecasted tonnages for the same period.

10.1 KRC

The following table provide summary results for KRC for selected years:

Table 10.1: Forecast Traffic and Revenue for KRC System

KRC	Scenario	2008	2010	2015	2020	2025	2030
TONNES (000)	HIGH	2,047	3,767	5,201	6,350	7,646	9,194
	BASE CASE	2,021	3,388	4,503	5,372	6,344	7,509
	LOW	1,994	3,009	3,795	4,430	5,141	6,005
T-KMs (000,000)	HIGH	1,465	2,697	3,724	4,546	5,474	6,583
	BASE CASE	1,447	2,426	3,224	3,847	4,542	5,377
	LOW	1,428	2,154	2,717	3,172	3,681	4,300
REVENUES (US $ 000)	HIGH	67,407	124,062	178,240	228,725	280,942	337,849
	BASE CASE	66,547	111,594	160,522	205,310	247,299	292,729
	LOW	65,688	99,103	135,289	169,295	200,401	234,107

The annual tonnage growth rates for the period 2008 to 2030 average 7.5%, 6.6% and 5.5% respectively for the HIGH, BASE CASE and LOW Scenarios.

10.2 URC

The following table provide summary results for URC for selected years:

Table 10.2: Forecast Traffic and Revenue for URC System

URC	Scenario	2008	2010	2015	2020	2025	2030
TONNES (000)	HIGH	719	1,395	1,909	2,345	2,836	3,424
	BASE CASE	710	1,210	1,602	1,932	2,301	2,743
	LOW	700	1,038	1,308	1,549	1,819	2,147
T-KMs (000,000)	HIGH	163	317	433	532	644	777
	BASE CASE	161	275	364	439	522	623
	LOW	159	236	297	352	413	487
REVENUES (US Millions)	HIGH	16,004	25,132	27,860	34,222	41,396	49,970
	BASE CASE	15,784	23,030	26,094	31,468	37,468	44,667
	LOW	15,563	20,841	23,705	28,071	32,955	38,897

The annual tonnage growth rates for the period 2008 to 2030 average 7.4%, 6.4% and 5.3% respectively for the HIGH, BASE CASE and LOW Scenarios, and are closely correlated to those of KRC.

10.3 TRL

The following table provide summary results for TRL for selected years:

Table 10.3: Forecast Traffic and Revenue for TRL System

TRL	Scenario	2008	2010	2015	2020	2025	2030
TONNES (000)	HIGH	850	1,863	3,456	3,985	4,582	5,296
	BASE CASE	842	1,601	2,799	3,205	3,659	4,203
	LOW	835	1,356	2,152	2,453	2,790	3,200
T-KMs (000,000)	HIGH	808	1,910	3,542	4,085	4,697	5,428
	BASE CASE	800	1,641	2,869	3,285	3,750	4,309
	LOW	793	1,390	2,206	2,514	2,860	3,280
REVENUES (US Millions)	HIGH	43,615	103,122	199,056	241,256	282,972	327,030
	BASE CASE	43,215	88,617	167,675	213,598	239,707	275,382
	LOW	42,815	75,082	128,928	157,542	182,780	209,634

The annual tonnage growth rates for the period 2008 to 2030 average 8.7%, 7.6% and 6.3% respectively for the HIGH, BASE CASE and LOW Scenarios; these growth percentages are higher that those of KRC and URC given the fact that we have assumed the concessionaire would grow faster in the early years by regaining significant market share of traffic lost to trucks in the recent years.

10.4 TAZARA

The following table provide summary results for TAZARA tonnage, tkm and revenue forecasts for selected years:

Table 10.4: Forecast Traffic and Revenue for TAZARA

TAZARA	Scenario	2008	2010	2015	2020	2025	2030
TONNES (000)	HIGH	594	719	1,096	1,522	1,980	2,527
	BASE CASE	589	699	1,018	1,368	1,738	2,166
	LOW	583	680	945	1,229	1,524	1,855
T-KMs (000,000)	HIGH	874	1,058	1,613	2,240	2,914	3,719
	BASE CASE	866	1,029	1,498	2,014	2,558	3,188
	LOW	858	1,001	1,391	1,809	2,244	2,730
REVENUES (US Millions)	HIGH	30,603	37,029	56,442	78,410	101,988	130,165
	BASE CASE	30,325	36,029	52,439	70,498	89,543	111,587
	LOW	30,046	35,046	48,686	63,327	78,535	95,550

The annual tonnage growth rates for the period 2008 to 2030 average 6.9%, 6.2% and 5.5% respectively for the HIGH, BASE CASE and LOW Scenarios.

11 New Railway Links Envisaged by EAC

11.1 New Links

The following links are being reviewed as far as their potential likeliness to materialize; in some instances, they are related to the opening of new mineral deposits and have a high probability of coming to fruition while in other cases, they have been tabled because they make sense, or are logical extensions to the current network, etc…

Table 11.1: Proposed New Links to be Considered under This Master Plan Study

	Link	Location	Kms
1	Kasese – Kisangani	Uganda – DRC	600
2	Gulu – Nimule – Juba	Uganda – S. Sudan	300
3	Pakwach – Bunia – Kisangani	Uganda – DRC	900
4	Bihanga – Kabale – Kigali	Uganda – Rwanda	300
5	Lamu – Garissa – Juba	Kenya – S. Sudan	1,600
6	Garissa – Addis Ababa	Kenya – Ethiopia	1,300
7	Liganga – Mchuchuma – Mtwara	Southern Tanzania (near Lake Nyasa to Mtwara Port)	800
8	Mchuchuma – Mbamba Bay	Southern Tanzania (to Mbamba Bay Port)	200
9	Liganga – Mlimba	Tanzania	250
10	Dar es Salaam – Mtwara	Tanzania (DAR Port down to Mtwara Port along the coast)	600
11	Isaka – Kigali / Keza – Gitega – Musongati (Isaka-Kigali with a branch at Keza (Tanzania) to Musongati (Burundi)	Northern Tanzania (south of Lake Victoria) – Rwanda	700
12	Branch from Isaka-Kigali to Kabanga	Tanzania-Rwanda connection to Kabanga	100
13	Branch from Isaka-Kigali to Biharamulo – Bukoba – Masaka	Tanzania-Rwanda connection to southern Uganda	300
14	Tunduma – Sumbawanga – Mpanda – Kigoma	Tanzania (on TAZARA at Zambia border toward north); to link with Tanzanian railway network at Kigoma	700 to Kigoma
15	Uvinza – Bujumbura	Tanzania – Burundi	300
16	Arusha – Musoma	Northern Tanzania – south edge of Lake Natron – Lake Victoria	500

11.2 Link Categorization

We have reviewed the above 16 new railway links and sorted them in the following categories for the purpose of reviewing the markets they are related to:

- Links that complete the network in Tanzania
- Links that are primarily related to mining projects and getting the fuels, chemicals and machinery into the mine and getting the export minerals to a port
- Links whose purpose is to provide rail transportation to existing countries or markets which are primarily dependent on road transportation, sometimes coupled with water transportation

Many of the 16 links fall in more than one category; they can provide an alternative to trucks for getting goods in and out of landlocked countries and also serve a mine that is located on or near its route. We have however chosen to sort the links and categorize them based on what we understand to be their main objective.

Following is our classification of the links into the 3 categories mentioned above:

Links that complete the network in Tanzania

- #10 - Dar es Salaam – Mtwara: this line would run along the Indian ocean and link the ports of Dar es Salaam and Mtwara
- #14 - Tunduma – Sumbawanga – Mpanda – Kigoma: this line should link the Tanzania railway network at Kigoma with the TAZARA railway near the Zambia border, along Lake Tanganyka while providing a route with the rich mineral area of southern DRC via ferries at Kigoma;

Links that are primarily related to mining projects

- # 7 - Liganga – Mchuchuma – Mtwara: this line would link southern Tanzania near lake Nyasa to the port of Mtwara, providing an export route for iron ore, coal, phosphate, vanadium and titanium mines;
- # 9 - Liganga – Mlimba: this line would also provide an export route to ports on the Indian ocean;
- #12 - Branch from Isaka-Kigali to Kabanga: this line would provide access to the Kabanga and Musongati mining area and link it to the port of Dar es Salaam;
- #16 - Arusha – Musoma: this line, in addition to providing access to lake Victoria from Tanga, would serve the phosphate deposits in Minjigu/Mukuyuni and the soda ash near Lake Natron;

Links providing rail transportation to land locked countries

- # 1 - Arusha – Musoma: this line would extend the Kenyan railway network from Arusha to lake Victoria, therefore providing Uganda with another access to the Indian ocean;

- # 3 - Pakwach – Bunia – Kisangani: this line would link the eastern RDC to the Uganda railway network;
- # 2 - Gulu – Nimule – Juba: this line would link southern Sudan to the Uganda railway network;
- # 5 - Lamu – Garissa – Juba: this line would link southern Sudan to the port of Lamu in northern Kenya;
- # 4 - Bihanga – Kabale – Kigali: this line would link Rwanda with the Uganda railway network;
- #11- Isaka – Kigali: this line would link the dry port of Isaka with Rwanda with a branch at Keza (Tanzania) to Musongati (Burundi);
- # 6 - Garissa – Addis Ababa: this line would link Ethiopia to the Kenya rail network;
- # 8 - Mchuchuma – Mbamba Bay: this line would provide access to Malawi via Lake Nyasa and link it to the port of Mtwara;
- #15 - Uvinza – Bujumbura: this line would serve Burundi while providing access to coal and nickel deposits and the rich DRC mining area;
- #13 - Branch from Isaka-Kigali to Biharamulo – Bukoba – Masaka: this line would serve sourhtern Uganda while also providing access to the Kabanga mining area.

11.3 Drivers of the New Lines

There are two main drivers behind the construction of these new links:

- Providing an alternate transportation mode to that of trucks for the movement of goods, imports, exports and domestic traffic for land locked countries or isolated geographic areas;

- Providing the transportation infrastructure required as part of establishing new mines with high outputs.

In order to provide a first cut at the markets for the 16 links described above, we will outline the information made available to us as part of our study as it relates to the transportation of goods for the land locked countries mentioned earlier and the mineral deposits that have been identified.

11.3.1 Land Locked Countries Traffic

Uganda and Zambia currently enjoy rail access via KRC, TRC and TAZARA for their transit goods entering the ports or Mombasa and Dar es Salaam; these ports have been handling significant tonnages to and from these countries as shown on the following table:

Table 11.2: Transit Tonnages via Mombasa Port and Dar es Salaam Port

Transit tonnages via Ports of MSA and DSM				
		2003	2004	2005
UGANDA	Imports	1,700,569	2,112,234	2,521,422
	Exports	235,485	239,573	267,948
	Total	1,936,054	2,351,807	2,789,369
RWANDA	Imports	202,296	207,900	271,279
	Exports	19,818	28,531	31,901
	Total	222,114	236,431	303,180
BURUNDI	Imports	51,603	82,582	162,198
	Exports	25,715	13,383	22,968
	Total	77,318	95,965	185,165
SUDAN	Imports	75,019	64,643	141,394
	Exports	308	2,582	5,420
	Total	75,327	67,225	146,814
DRC	Imports	159,557	216,251	308,781
	Exports	15,544	32,403	47,637
	Total	175,101	248,654	356,418
MALAWI	Imports	75,461	60,684	131,481
	Exports	184	296	2,798
	Total	75,645	60,980	134,279
ZAMBIA	Imports	529,599	597,011	787,208
	Exports	90,975	147,318	113,492
	Total	620,574	744,329	900,700

Source: KPA & TPA

Traffic to the land locked countries of Rwanda, Burundi, Sudan, DRC and Malawi which would benefit from rail competition as a result of the proposed new rail links has however been much less, in the range of 150,000 to 350,000 tonnes per year for 2005.

11.3.2 Mining Potential Outputs

During our visits and meetings, numerous new mining projects were mentioned or inventoried; we do not know the current status of these potential developments as far as economic feasibility and we have not researched or tried to obtain the latest timelines for their potential operation start-up.

However, a recent Draft report of March 2007 entitled "BCDC Minerals development & Investment Strategy" prepared for the SDI by SSI Engineers, Turgis Consulting, Dancraft Mining Services and Logistics Engineering Ltd. indicates that many of the current and potential mining sites are related to the production of gold and are of the artisanal and small scale mining type. Gold and artisanal mines do not typically produce significant tonnages for transportation and their outputs would likely not be sufficient to justify the construction of new railway links, especially in areas where new and improved highways are being built.

The above report mentions that the Rwanda and eastern DRC mining output was somewhere in the 8,000 to 10,000 tonne/year range in 2005 while that of Tanzania was some 40,000 tonnes/year; the potential cassiterite output from new Rwanda mines is in the 20,000 tonnes per year; it also mentions that the imports of materials for all BCDC mines currently in operation are in the 18,000 to 20,000 tonnes/month. These are small volumes when considering the economic justification for the construction of new railway lines.

Following is a summary of the information that was made available to us during our meetings or which we have gathered from different reports and articles:

- Mchuchuma: 840,000 tonnes per year of washed coal, iron ore, phosphate deposits;
- Ngara: Cobalt;
- Kabanga: Nickel deposits, potential 200,000 to 400,000 tonnes/year (2012-13;)
- Musongati – major deposits of nickel (reserves of 180 m tonnes) and other mineral deposits;
- Nyabikere and Waga – nickel mines (reserves of 90 m tonnes)
- Geita: Gold deposits;
- Lake Natron: Soda ash, 1 M tonnes/year;
- South of Kigoma: platinum mine;
- Makuyuni: phosphate deposit, 100,000 tonnes/year;
- South-west Tanzania: salt deposits;
- Zambia Copper Mines:
    - Konkola Copper Mines: 500,000 tonnes/year by 2011
    - Mopani Copper Mines: 200,000 tonnes/year
    - Lumwana Copper Mines: 500,000 tonnes/year
    - Kansanshi Copper Mine: 150,000 tonnes/year
    - Other mines: 250,000 tonnes/year

We cannot within the scope of this initial traffic working paper prepare detailed forecasts for the above mentioned links; the market information we have gathered during the course of our visits and meetings will need to be expanded and validated as part of individual feasibility studies for each link.

In-depth market and operational studies as well as capital cost estimates will also need to be undertaken to establish the economic feasibility of constructing and operating these new railway links.

12 Conclusions, Issues and Risks

12.1 Conclusions

The current rail networks of the EAC will play a critical role in the economic growth of these countries. We have shown that the growth potential is large and our forecasts indicate that they can grow significantly from their current state. As far as the potential new links are concerned, the growth of the land locked countries' economies combined with the many mining and other developments could make it economically or politically attractive to build some of them. Detailed studies will need to be conducted to determine which ones warrant investments.

This report is a working paper and is not meant to be final by all means; it summarizes the information gathered and provides our best estimates of the possible outcomes of the concessioning processes that have been recently followed by the concerned governments. The range of scenarios we have detailed should cover the spectrum of the likely future outcomes.

12.2 Issues and Risks

The risks associated with the market basically come from truck competition and rail's market share within Kenya, Uganda and Tanzania and the growth rates of the land locked countries and mining developments; we are confident that we have addressed them by developing HIGH and LOW scenarios.

However, while the risks associated with the forecasted tonnages and revenues are normally dependent on the market growth in addition to the truck competition, we are of the opinion that in the case of KRC, URC and TRC, it is mostly dependant on the concessionaires' ability to quickly turn around the operations and improve service delivery; the traffic is available and waiting for the concessionaires to improve and offer a competitive rail service and handle the business awaiting.

As with all forecasts, much will also depend on the port of Mombasa and the port of Dar es Salaam's ability to cope effectively with the anticipated growth in traffic. While there might be temporary displacement of traffic to move via the non-natural routes, we are confident that in the long term, transit traffic should gravitate to their natural routes.