CORRIDOR DIAGNOSTIC STUDY OF THE NORTHERN AND CENTRAL CORRIDORS OF EAST AFRICA

DRAFT ACTION PLAN
Volume 1: Main Report

SUBMITTED TO
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Contents

Illustrations

Tables

Figures

Acronyms

BOL	bill of lading
CCTFA	Central Corridor Transit Transport Facilitation Agency
CD	chart datum
CDS	Corridor Diagnostic Study
CFS	container freight stations
COFC	container on flat car
COMESA	Common Market for Easternand Southern Africa
CY	container yard
DRC	Democratic Republic of Congo
EAC	East African Community
EIR	equipment interchange report
EIRR	Economic internal rate of return
FONA	First Order Network Assessment
GRT	gross register tonnage
HCM	Highway Capacity Manual
HDM	Highway Design Manual
ICD	inland container depots
IRI	International Road Indices
KMA	Kenya Maritime Authority
KPA	Kenya Port Authority
km	kilometers
LoLo	lift on-lift off
LOS	Level of service
m	Meters
MCT	Mombasa Container Terminal
MHC	mobile harbor crane
MLL	Marine Logistics Ltd.
NCTTCA	Northern Corridor Transit Transport Coordination Authority
OCR	Optical Characteristic Reader
PPP	Public Private Partnership
RA	Revenue Authorities
RAHCO	Reli Assets Holding Company
RFID	Radio Frequency Identification Device
RMG	rail mounted gantry

RoRo	roll on-roll off
RTG	rubber tire gantry
RS	Reachstackers
RVR	Rift Valley Railways
SADC	Southern African Development Community
SPM	single point mooring
STS	ship to shore
SUMATRA	Surface and Marine Transport Regulatory Authority, Tanzania
TICTS	Tanzania International Container Terminal Services
TAZARA	Tanzania-Zambia Railway Authority
TEU	twenty-foot equivalent unit
TOFC	trailer on flat car
TOS	terminal operating system
TPA	Tanzania Port Authority
TRC	Tanzania Railways Corporation
TRH	Tanzania Road Haulage
TRL	Tanzania Railways Limited

Introduction

Background

The Northern Corridor anchored by the port of Mombasa in Kenya, and the Central Corridor, anchored by the port of Dar es Salaam in Tanzania, are principal and crucial transport routes for national, regional and international trade of the five East African Community (EAC) countries, namely; Burundi, Kenya, Rwanda, Tanzania and Uganda. Due to inadequate physical infrastructure and inefficiency, these corridors are characterized by long transit times and high cost. Freight costs per km are more than 50 percent higher than the USA and Europe and for the landlocked countries; transport costs can be as high as 75 percent of the value of exports. Modernization of transport infrastructure and removal of non-tariff barriers along these corridors is critical for trade expansion and economic growth, which are key to the success of regional integration as well as creation of wealth and poverty alleviation in the individual countries.

The Heads of State in the COMESA, EAC and SADC, the Tripartite, have determined that the transport inefficiencies are among the biggest impediments to realizing their vision to lead their countries out of poverty. Transport costs are prohibitively high and are a barrier to trade and investment, which are the cornerstone for the aspired economic growth to regional prosperity.

Having had the experience of successful development of an action plan to effectively tackle transport bottlenecks on the North-South Corridor, the Tripartite has ordered the preparation of a similar action plan for the key trade routes of Eastern Africa. As a technical foundation for the action plan, regional stakeholders in March 2009 agreed to carry out a Corridor Diagnostic Study (CDS) with funding from the U.S. Agency for International Development (USAID) and the U.K. Department for International Development (DFID).

Goals of the Study

To overcome the challenges the Governments face in the region, the Corridor Diagnostic Study's goals focus on:

- Collecting and synthesizing existing information on time and cost of transporting goods
- Compiling and assessing national and regional policies
- Analyzing costs and benefits of interventions
- Setting a baseline to measure future corridor improvement
- Highlighting solutions that include PPPs
- Creating an Action Plan

The Action Plan is to guide development of an efficient transport system in the East Africa region. It will galvanize implementation in the member countries and support from international partners and private sector. The Action Plan will be presented by the Tripartite at an international investment conference to showcase the approach and mobilize necessary investment finance. Major finance institutions, the private sector, investment funds and consortiums, and bilateral and multilateral donors will be invited to participate. It is expected that the CDS will make a difference in securing implementation of projects and removing the long standing transport bottlenecks in East Africa.

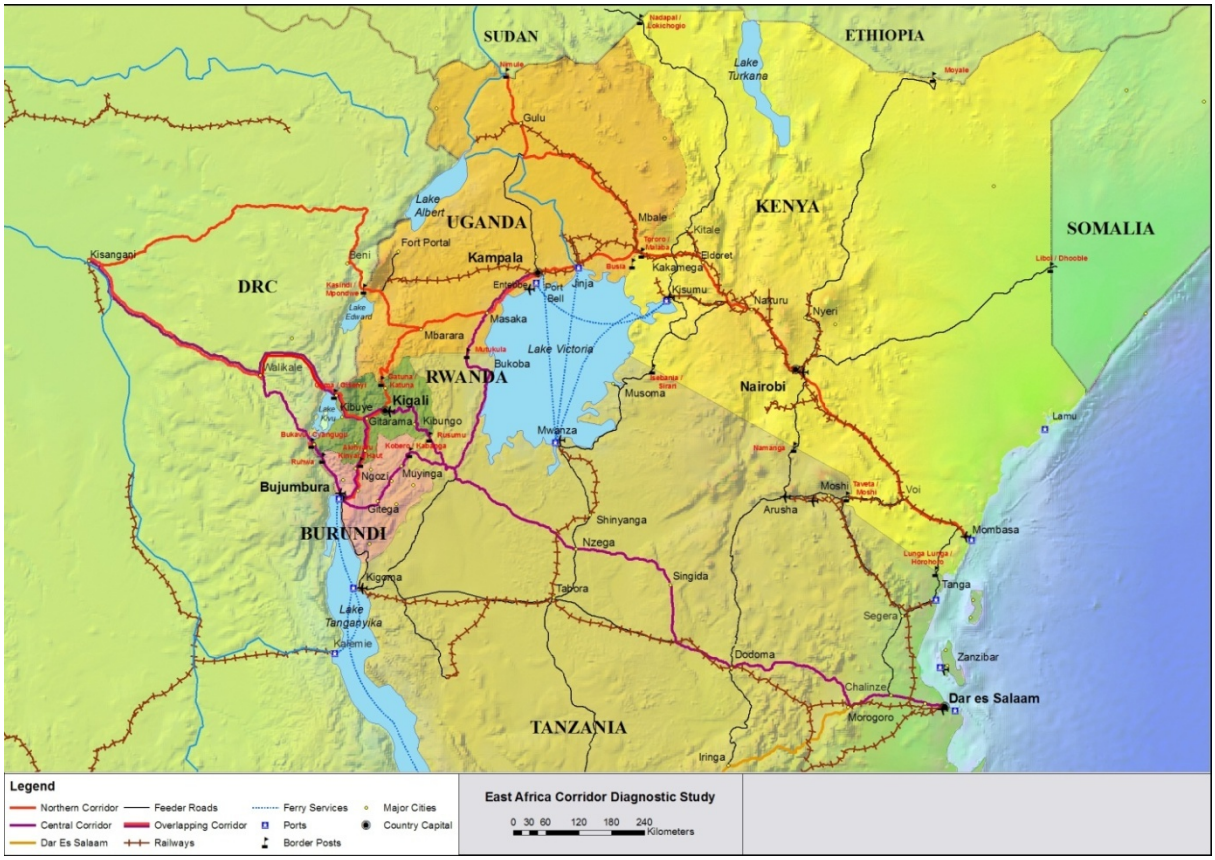
The Action Plan while cognizant of the long-term development strategies for the region, is focused on identifying interventions and measures that can have an immediate and near-term impact on the Corridors' performance. As such, the projects proposed are those that can be implemented within the next five years.

A Draft Action Plan will be presented at a major stakeholders' workshop for review and verification. Subsequently, the final report and Action Plan will be prepared and presented to a regional Ministerial meeting for approval and, thereafter, submission to the Tripartite.

Geographic Scope of Study

The Corridor Diagnostic Study reviewed the infrastructure condition, non-tariff barriers, and regulatory policy of the Northern Corridor anchored by the port of Mombasa in Kenya, and the Central Corridor, anchored by the port of Dar es Salaam in Tanzania, which are principal and crucial transport routes for national, regional and international trade of the five East African Community (EAC) countries, namely; Burundi, Kenya, Rwanda, Tanzania and Uganda (see Figure 1). The CDS analysis also includes the extension of the Northern and Central Corridors to the Democratic Republic of the Congo and links to Southern Sudan, Ethiopia and Zambia.

Figure 1-1. CDS Geographic Scope



Collaboration with Other Regional Transport Studies

Concurrent with the CDS effort, there are several other regional transport studies addressing current corridor performance and identifying priorities for future infrastructure investments in eastern Africa. These studies include:

- Northern Corridor Infrastructure Master Plan conducted for the NCTTCA by Louis Berger International
- EAC Transport Strategy & Road Sector Development Program conducted for the EAC by Aurecon
- Northern Corridor Analytical Comparative Transport Cost Study conducted for the NCTTCA by CPCS Transcom Limited

As directed by the studies' sponsors, the four firms responsible for these studies identified areas of commonality in which to share data, information and analytical findings in order to make the most effective use of study resources and to enhance the studies' quality and consistency. Further collaboration will include the joint review and discussion of the proposed infrastructure and operational projects included in the Draft Action Plan.

2. Northern Corridor Infrastructure and Performance

This chapter presents the results of the diagnostic audit of the performance of the Northern Corridor that was conducted from November 2009 through September 2010. The diagnostic audit was performed using the a software and audit methodology called *FastPath*® to apply to transport logistics chains to measure the current state of performance (in terms of time, cost, and reliability) and to identify bottlenecks and potential solutions[1].

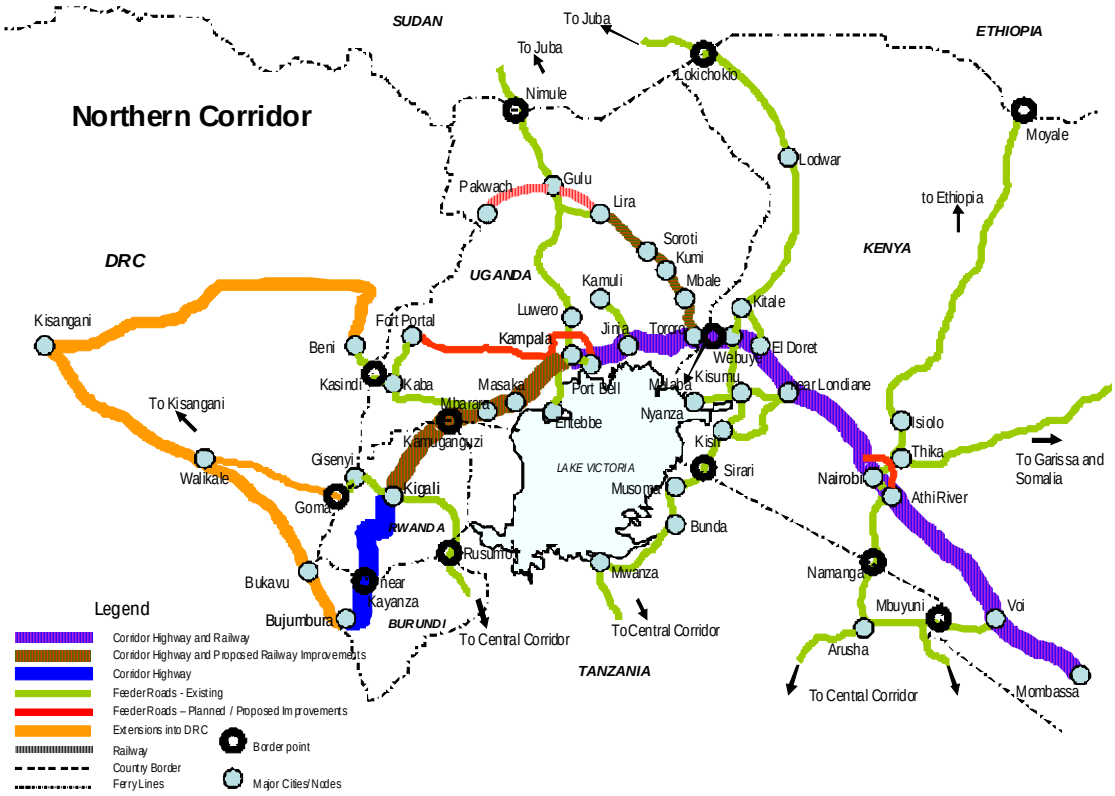
The chapter commences with a description of the existing Northern Corridor infrastructure and its conditions by mode. This is followed by the diagnostic assessment of the corridor's performance.

Existing Infrastructure and Conditions

The Northern Corridor connects the Port of Mombasa to markets in Kenya, Uganda, Rwanda and Burundi as well as southern Sudan. eastern DRC and parts of northern Tanzania (see Figure 2-1). As such, it connects the entire East African Community to a major regional port and for intra-regional trade and personal mobility. The road connects four of the five East African Community (EAC) countries and is one of the six identified strategic corridors for the EAC. It also links the EAC to states on its periphery: Sudan, DRC and Ethiopia. It is strategic because of the importance of the Port of Mombasa to the region. Despite its centrality in regional development, there are still many facilitation problems.

[1] *FastPath* is a proprietary diagnostic tool developed in a partnership between USAID and Nathan Associates to analyze transport infrastructure and operational inefficiencies in the transport/logistics chains serving import and export traffic. *FastPath* provides a quantitative basis for monitoring corridor performance. The audit methodology consists of surveys and questionnaires to identify bottlenecks and appropriate improvements to freight corridors.

Figure 2-1 Northern Corridor Network



Source: Nathan Associates Inc.

MOMBASA PORT

As a multipurpose port, Mombasa handles containerized cargo, general cargo, dry bulk, and liquid bulk. In 2009 the total throughput of the port was 19.1 million tons; throughput has been growing at an average annual rate of 8.8 percent from 2002-2009. The predominant traffic of the port is imports, which represent 86.6 percent of the total traffic. For imports, 38.9 percent is liquid bulk, 28.1 percent is dry bulk, 24.7 percent is containerized cargo and only 8.2 percent is general cargo.

Table 2-1 Mombasa Port Traffic, 2002-2009 (000s tons)

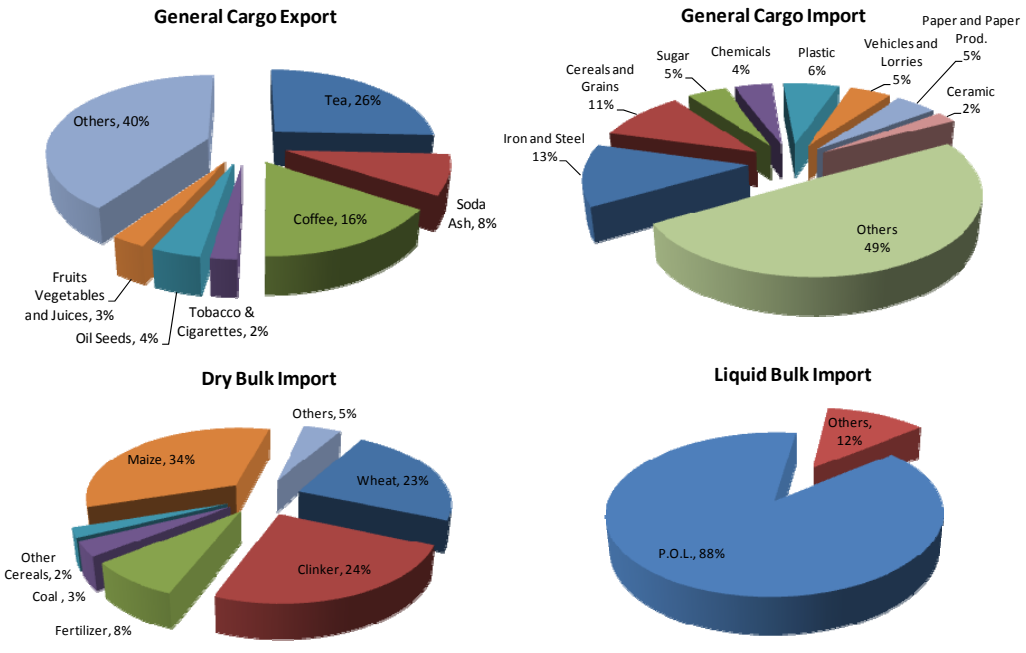
Type of Cargo	2002	2003	2004	2005	2006	2007	2008	2009	AAGR 2002-2009
Imports									
Containerized Cargo	1,624	2,228	2,599	2,645	2,970	3,761	3,959	4,086	14.1%
General Cargo	1,196	1,209	1,236	1,009	1,129	1,105	1,020	1,349	1.7%
Dry Bulk	1,098	1,404	1,588	2,128	2,344	2,722	2,891	4,641	22.9%
Liquid Bulk	3,926	4,491	4,595	4,918	5,403	5,474	5,441	6,431	7.3%
Total	7,844	9,332	10,018	10,700	11,846	13,062	13,311	16,507	11.2%
Transit Cargo[1]	1,875	2,186	2,590	3,202	3,473	4,042	4,471	4,612	13.7%
Exports									
Containerized Cargo	1,466	1,135	1,669	1,680	1,625	1,934	1,996	1,952	4.2%
General Cargo	241	208	198	139	185	168	299	269	1.6%
Dry Bulk	464	380	381	286	313	205	200	62	-25.0%
Liquid Bulk	209	271	246	173	132	167	190	167	-3.2%
Total	2,380	1,994	2,494	2,278	2,255	2,474	2,685	2,450	0.4%
Transit Cargo	340	266	300	334	335	381	404	368	1.1%
Total Imports and Exports	**10,224**	**11,326**	**12,512**	**12,978**	**14,101**	**15,536**	**15,996**	**18,957**	9.2%
Transhipment	340	605	409	303	318	426	419	105	-15.5%
Total Traffic	**10,564**	**11,931**	**12,921**	**13,281**	**14,419**	**15,962**	**16,415**	**19,062**	8.8%
Container Traffic (TEU's)	305,427	380,353	438,597	436,671	479,355	585,367	615,733	618,816	10.6%

Note 1: Included as part of total cargo

Source Kenya Ports Authority

Exports through the Port of Mombasa have been stagnant during the 2002-2009 period showing an average annual increase of 0.4 percent. Transshipment represents a minimal portion of the port traffic with only 0.5 percent participation in 2009; moreover the volumes of this type of cargo have been shrinking markedly in the last five years.

Figure 2-2. Mombasa Port Traffic Composition by Commodity, 2009

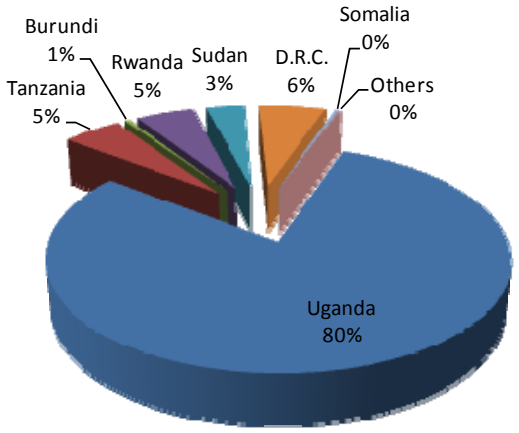


Source: Kenya Port Authority

The main export commodities handled at the port are coffee, tea and soda ash accounting for about 50 percent of the total general cargo exports. In terms of general cargo imports, the most important commodities are iron and steel followed by plastic, rice, vehicles, sugar, paper and chemicals with similar participations between seven and four percent. Dry bulk imports are clearly dominated by maize, clinker and wheat, which account for 81 percent of the dry bulk imports total. Finally, petroleum, oil and lubricants represent 88 percent of liquid bulk imports.

Almost five million tons of transit cargo were moved through the port in 2009. By far, the most important origin / destination of transit cargo moved through Mombasa is Uganda, followed by D.R.C., Tanzania and Rwanda. Inbound and outbound transit flows with Tanzania have shrunken; imports towards Burundi and Somalia and exports from Rwanda have also decreased.

Figure 2-3. Mombasa Port Transit Traffic, 2009 (percent)



Source: Kenya Port Authority

The current layout of Mombasa Port is presented in Figure 2-4, and the characteristics of the port are presented in Table 2-2. The main physical constraint at the port is the access channel, which is narrow (200 m) and shallow (approximately 13.7 m). Nevertheless, there are plans to widen and deepen the channel, to construct an additional new container terminal at Kipevu West and to establish a petroleum terminal just down the coast where the water is deeper and to relocate the tank farm further from the city with safety and environmental benefits. Funds have already been secured for the new container terminal which will have three berths of 900 meters and 100 hectares of yard space.

Figure 2-4. Current Layout of Mombasa Port

Table 2-2. Characteristics of Mombasa Port

Item	Description
Natural Catchment Area	Kenya, Uganda, Sudan, Great Lakes region and Southern Ethiopia
Vol of freight – total, import, export mtpa	19 mtpa in 2009
No of berths, depths	16, 10.0m
Container Berths	5, total length 964m
Container Equipment , Capacity	4 x 40t gantry cranes, full capacity
Container Vols - total, Imp, Exp - TEUs	619,000 in 2009
Bulk berths & equipment	17 cranes, 5t to 20t
Marine Access	Channel 15km long, 13.7m deep, tide 2.5 to 4m
Road Access	Poor, congested
Rail Access	Via RVR
Current Operational Status	Fully operational, congested, only port serving Kenya
Specific Problems / Issues	Container dwell time, port congestion, recently improved.
Planned Developments	70-% of all cargo containerized – planned expansion of container terminal, improved road and rail access. Possible additional port at Lamu
Intervention / Assistance Required	No plans yet for container terminal privatization

Source: Nathan Associates Inc.

Container Facilities

Containers are handled in Mombasa in two types of facilities: (1) specialized container terminals and (2) conventional terminals. The conventional terminals also handle other, non–container cargoes. The specialized terminals handle about 70–80 percent of the total container throughput. Containers are not handled by direct delivery. The containers are first stored in container yards, stay several days inside the terminals and only then, are usually released.

Mombasa's specialized container terminal (Kipevu West), Berths 16–18, consists of:

- 650 m of marginal berthage with –10.2 m depth CD alongside and about 15 ha of backup area
- Four gantry, STS cranes
- RTG based container yard
- Back of terminal intermodal yard with two RMGs

The conventional terminal in Mombasa includes Berths 11–14 with a total of about 800 m of berthing length and a depth alongside of about –10 meters. This terminal also handles general cargoes. Berths 13–14 are used exclusively for containers, mostly those of one shipping line (Maersk). All container handling in Mombasa's conventional terminal is by ship's gear. Mombasa has only one mobile harbor crane, but it is not presently used for ship handling.

Traffic of containerized cargo reached 619 thousand TEU in 2009 (Table 2-3). Preliminary data indicate that container traffic increased by 13 percent in 2010. The handling of empty containers is significant; it represents 34.6 of the total TEU handled at the port. This is a reflection of the imbalance between imports and exports flowing through the port.

Table 2-3. Mombasa Port Container Traffic, 2003-2009 (TEU)

Type	2003	2004	2005	2006	2007	2008	2009	AAGR 2003-2009
Imports								
Full	159.0	190.0	193.2	217.9	277.8	292.3	301.5	7.7%
Empty	14.0	14.0	14.6	11.6	4.2	5.1	6.4	-12.8%
Exports								
Full	78.0	91.0	94.1	86.3	101.3	102.9	95.8	0.3%
Empty	79.0	110.0	107.5	132.2	165.5	181.0	205.6	11.4%
Transhipment								
Full	44.0	29.0	22.3	21.8	30.5	30.3	7.4	-16.8%
Empty	6.0	5.0	5.0	9.5	6.0	4.2	2.1	-13.3%
Total								
Full	281.0	310.0	309.7	326.0	409.6	425.5	404.7	4.6%
Empty	99.0	129.0	127.0	153.3	175.8	190.2	214.1	9.1%
Grand Total	**380.0**	**439.0**	**436.7**	**479.4**	**585.4**	**615.7**	**618.8**	6.0%

Source: Kenya Port Authority

Mombasa container terminal is not designed according to the specifications of modern container terminals. The width is about 250 m, while modern terminals' width is usually 400–500 m. As a result, the backup area is limited. Moreover, there is no practical way of expanding the terminal areas since the marine port facilities are cordoned by the city or other private facilities. The small backup area provides for relatively small container yard. The resulting shortage in container yard currently is the main source of terminal congestion in the port.

A related and even more severe problem is traffic congestion inside and outside the terminal. The container yard seems to have difficulties in serving ship and gate traffic at the same time. During our visits at the terminal we observed long waiting lines of trucks inside the terminal and at both out and in gate. The result is that the STS cranes often wait for yard tractors, a major factor for the low crane productivity and subsequently low berth productivity.

CFS (or ICDs) were first permitted in Mombasa in 2007. At present, Mombasa has 17 CFS, about half of them handle containers. However, it is understood that only seven are presently handling import boxes.

NORTHERN CORRIDOR ROAD SYSTEM

The trunk road network of the Northern Corridor that stretches from Mombasa to Bujumbura via Malaba is 1,970 km and to Goma is 1,846 km. An assessment of the Northern Corridor road network was carried out by Aurecon for the East African Transport Strategy and Regional Road Sector Development Program conducted for the EAC in 2010. This assessment consisted of two major elements: road capacity and road condition.

Road Capacity and Other Characteristics

The evaluation of road capacity was based on level of service standards defined in Aurecon's First Order Network Assessment (FONA) model developed based on the Highway Capacity Manual (Transportation Research Board, 2000). Level of service (LOS) with indices ranging from A (best operating conditions) to F (worst operating conditions). The best operating conditions entail free flow high (design) average speeds and able to overtake easily. The road capacity of the Northern Corridor in terms of LOS is presented in Table 2-4. Approximately 22 percent of the trunk road is rated at a LOS of C or better; 38 percent of the road was rated at a LOS of D, while 45 percent of the road was rated poor at a LOS of E or F.

Table 2-4. Characteristics of the Northern Corridor Road Network

Corridor Name		Northern Corridor						Corridor Length (km)		1898 km	
Corridor Description		Mombasa-Voi-Eldoret-Rigiri-Kamala-Masaka-Kigali-Kibuye-Kayanza-Bujumbura									
Lanes	1	2	Travel Speed	70km/h	80km/h	90km/h	Road Reserve			10.6m	17.6m
Length	1738 km	161 km	Length	852 km	890 km	158 km	Length			1738 km	161 km
	91.5%	8.5%		45%	47%	8%				92%	9%
Terrain	Level	Rolling	Mountain	Land-use	Urban	Rural	Surface			Paved	Unpaved
Length	131 km	1718 km	50 km	Length	329 km	1570 km	Length			1896 km	3 km
	7%	91%	3%		18%	83%				100%	1%
Number of Accesses / km	0 Accesses		1 Access		2 Accesses		3 Accesses			> 4 Accesses	
Length	1634 km		121 km		88 km		57 km			0 km	
	87%		7%		5%		3%			0%	
Traffic Volumes*	0-50	51-100	101-200	201-300	301-400	401-500	501-750	751-1000	1001-1500	1501-2000	
Length	55 km	106 km	784 km	466 km	326 km	38 km	52 km	70 km	5 km	0 km	
	3%	6%	42%	25%	18%	2%	3%	4%	1%	0%	
Corridor Performance (Level of Service)		A		B	C		D	E		F	
		Very Good		Good	Acceptable		Acceptable	Poor		Very Poor	
2010 (Base Year) Scenario		111 km		148 km	138 km		711 km	812 km		19 km	
		6%		8%	8%		38%	43%		2%	

Source: Aurecon, East African Transport Strategy and Regional Road Sector Development Program, 2010.

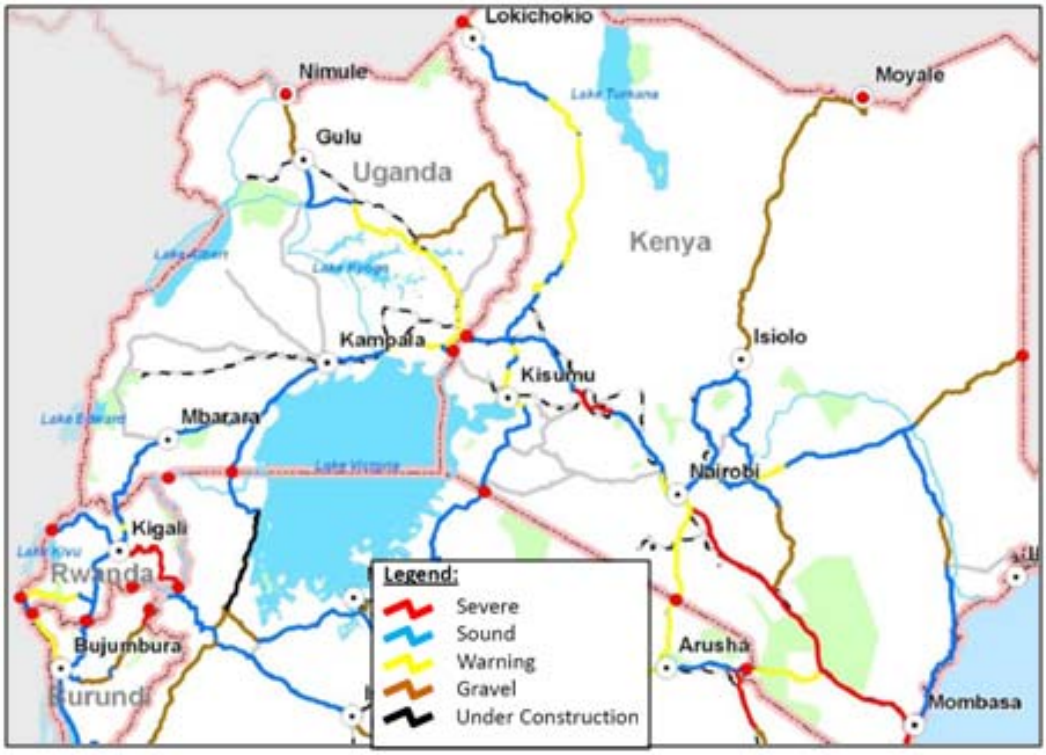
Road Conditions

Data obtained from the Primary and Secondary sources were used to determine the current condition status of the pavement structures of this EAC corridor. The first and foremost indicator of the pavements' condition

was pavement roughness, also referred to as riding quality. This objective measurement describes the distortion of the pavement surface which contributes to an undesirable or uncomfortable ride. The unit for roughness is the International Roughness Index (IRI) ranging between 0 (Good) to 20 (Very Poor).

- Paved roads are typically maintained at roughness levels between 2 and 6 IRI. These roads require no immediate remedial action and are considered to be in a sound state.
- Paved roads that are approaching a severe state have typical roughness levels between 6 and 10 IRI. These roads are in warning state.
- Paved roads in a severe condition, requiring immediate remedial action have typical roughness levels above 10 IRI.

Figure 2-5. Condition Assessment of Northern Corridors Roads



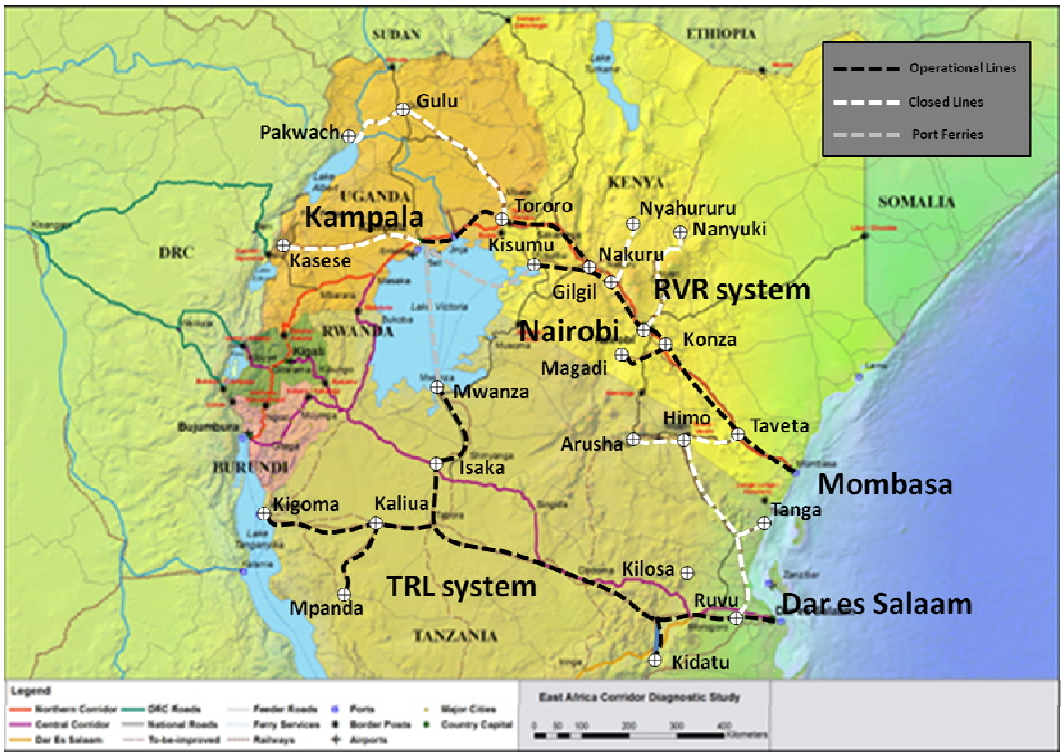
Source: Aurecon, East African Transport Strategy and Regional Road Sector Development Program, 2010.

RAIL SYSTEM

The Northern Corridor rail system operates within Kenya and Uganda as a narrow gauge (1,000 mm) system, compatible with the Tanzania Railway Limited (TRL) system on the central corridor in Tanzania. The line extends from the port of Mombasa to Nairobi, and further to Malaba, connecting to the Ugandan rail system serving Kampala and on to Kasese close to the DRC border. There are several spurs, the most important being the line to Kisumu on Lake Victoria, and the spur to Magadi Soda south of Nairobi. The rail link to Tanzania is closed, because of low traffic demand. This is also the case for the line between Kampala and Kasese, and the

northern Ugandan line from Tororo through Gulu to Pakwach on Lake Albert, which has a road /rail bridge across the Nile. Rebel activity is also partly responsible for closure of this line, which was built as recently as the 1960s.

Figure 2-6. Existing Northern and Central Corridor Rail Systems



Source: Prepared by Nathan Associates Inc.

The condition of the Northern Corridor railway track is presented in Table 2-5. The poor condition of the track has lead to imposition of temporary speed restrictions on many sections across the track, resulting in about 20 derailments per day and unpredictable transit times.

Table 2-5. Condition of Northern Corridor Railways Tracks

Section	Length (km)	Condition of the track and rail weight	Needed intervention
KENYA			
Mombasa-Nairobi	530	Good/Fair: 95 lb/yard	Spot Rehabilitation Replacement of rails and slippers
Nairobi-Malaba	550	Good/Fair: 80 lb/yard	Replacement of rails and slippers Reconstruction of culverts
Nakuru-Kisumu	217	Fair/poor: 80 lb/yard (60 km) and 60 lb/yard (160 km)	Improvement of track of 160 km Reconstruction of culverts and viaducts
UGANDA			
Malaba-Kampala	250	Fair/poor	Rehabilitation of the line including bridges
Port Bell-Kampala	10	Good	
Kampala-Kasese	332	Poor	Rehabilitation

Source: NCIMPS, Interim Report.

RVR inherited thirty-nine mainline (Class 93/94) diesel electric locomotives from KRC, which form the core of the mainline fleet. These locomotives are North American GE U26Cs, fitted with 2,600hp engines. A total of twenty-six were built in 1977 and the remainder in 1987 or later. The bulk of the mainline fleet is therefore thirty-seven years old, but continues to remain serviceable and suitable for rehabilitation and upgrading. In southern Africa, many of the mainline locomotives still in service are more than fifty years old, and continue to be serviceable.

On the RVR Uganda section between Malaba and Kampala, the mainline locomotives are much smaller, similar to those used on the TRL system in Tanzania, 1200hp. During the 1980's the Nalukolongo railway workshop near Kampala was equipped and upgraded through a €40 million program by KfW, and it is well qualified to carry out full refurbishment of the Uganda locomotives, subject to financing being available. The longer term objective would be to replace the Uganda locomotives with larger units similar to those operated in Kenya, to allow for seamless railway operations.

LAKE TRANSPORT

A description and assessment of the lake ports and transport on Lakes Tanganyika and Victoria that serves both corridors is presented in Chapter 3 on the Central Corridor.

BORDER CROSSINGS

Border crossings within the region are characterized by poor infrastructure, inadequate coordination and congestion. The busiest and most congested border on the route is at Malaba between Kenya and Uganda. One stop border post (OSBP) operations are being introduced on all the Northern Corridor borders with support from the World Bank and African Development Bank as part of the East Africa Trade and Transport Facilitation Project. Under this project, the World Bank is supporting new border facilities at Malaba and Gatuna/Katuna on the Uganda/Rwanda border and the African Development Bank is supporting feasibility studies for OSBP at Akinyaru/Kinyaru Haut on the Rwanda/Burundi border, Gisenyi/Goma on the Rwanda/DRC border and Mpondwe/Kasindi on the Uganda/DRC border. The regional OSBP legal framework being developed by the East Africa Community with support from JICA provides the legal jurisdiction and structure, operating principles and methods of coordination. The approval process has involved all border agencies as has the joint planning for the new OSBP border facilities. Continuing support for this coordination is critical.

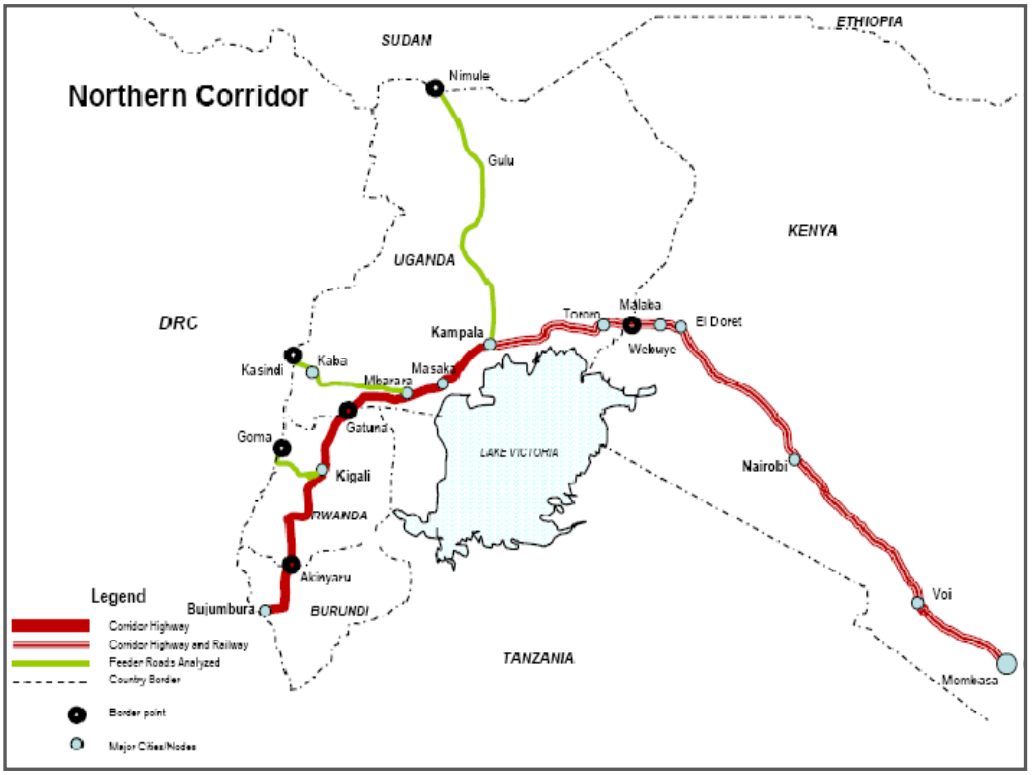
Cargo clearance can be done at the border, but in most cases is done at inland clearance centers, most in capital cities. Where clearances are not done at the border, the border clearance is generally done in a few hours. Nevertheless, the process is not done and the 1-3 day final clearance should be seen as part of the overall process. In the following discussion of corridor performance, the term border is used to describe both the cost and time spent at the border plus the average time at the final inland clearance point. In terms of improving facilitation on the Northern Corridor, both control points are important.

Most of the trucks operating on the route are Kenyan-owned since it is easier for them to arrange cargo from the port and then seek return hauls in the other countries. Nevertheless, the cargo is significantly imbalanced in favor of imports and many return hauls are empty. The Kenyan road transporters have a very active association, the Kenya Transport Association, which represents their interests at the port and with government agencies concerning the regulations that affect their operations. Freight forwarders are represented with national and regional associations. These associations will be important "drivers" for more effective transport facilitation measures on the Corridor.

Corridor Performance

The performance assessment provides a framework for the detailed analysis conducted through the use of our logistics toolbox, FastPath. This is done based on three variables that define the performance of transportation networks: price (as experienced by the shippers of cargo - producers and importers), time and the reliability of completing the shipment.

Figure 2.7. Links and Nodes Schematics of the Northern Corridor



Source: Prepared by Nathan Associates Inc.

For analysis purposes the Northern Corridor has been defined according to Figure 2-6 shown below. The main origins/destinations of cargo are the port of Mombasa, Nairobi, Kampala, Kigali and Bujumbura along the main corridor. Additional origins/destinations are Goma and Kasindi (access to eastern DRC) and Nimule

(access to southern Sudan). These origins/destinations were selected based on their importance as population and industrial centers as well as consolidation and redistribution centers.

The transport network is divided into nodes and links each representing different physical and operational characteristics. The nodes represent the port, ICDs, border posts, lake ports and regular nodes that are necessary to separate links with different characteristics. The port node contains information regarding five elements within the ports: the channel, the berth, the yard, customs clearance and the gate. Other nodes contain information specific to their physical characteristics and their operations. The links represent road, rail and maritime segments with unique characteristics. They contain modal information on capacity, topography, price and travel time that defines its performance.

OVERVIEW OF CORRIDOR PERFORMANCE

Imports

Table 2-6 shows the price, time and reliability of each of the destinations from the port of Mombasa for imports of different handling types of cargo served by road. The reliability indicator reflects the range of variations in time with respect to the average time it takes to complete each stage of the logistics chain. A higher value for the reliability indicator signifies a greater variation and more likelyhood of long delays.

Information on Table 2.6 shows, for example, that for dry bulk going to Bujumbura the total price is US$8,511 per truck (US$360 at the port), it takes 364 hours to complete the trip (170 hours at the port) and has a reliability indicator of an average 200 percent (424 percent at the port). Generally, the price for heavy containers, dry and liquid bulk is similar. As expected, Table 2-6 shows that the price goes up with distance (lowest rate per km is to Kampala at US$1.78/km for light containers). But it also shows that there are destinations with higher rates due to dangerous conditions (Nimule at US$3.53/km for light containers) and destinations with extensive delays to clear customs while the cargo remains loaded in the truck (Bujumbura, Goma and Kasindi at US$2.60, US$2.66 a US$2.97/km respectively).

Table 2-6. Northern Corridor Performance for Imports by Cargo Type and Destination, 2010 (via road)

Destination	Distance km.	Price (US$)				Time (hours)			Reliability Indicator (%)		
		Containers		Bulk		Containers	Bulk		Containers	Bulk	
		Light	Heavy	Dry	Liquid	Light/ Heavy	Dry	Liquid	Light/ Heavy	Dry	Liquid
Nairobi	480	1,396	1,895	1,530	1,365	396	181	145	158	377	359
Kampala	1,180	2,099	3,448	3,511	3,316	323	276	240	194	262	217
Kigali	1,661	3,901	6,595	6,658	6,463	376	329	293	167	220	178
Bujumbura	1,903	4,950	8,448	8,511	8,316	411	364	328	153	200	160
Nimule	1,526	5,383	7,697	7,760	7,565	381	334	274	165	217	190
Kasindi	1,623	4,825	9,635	9,698	9,503	372	325	289	168	223	180
Goma	1,811	4,822	8,137	8,200	8,005	537	490	454	131	162	135
Port Node*											
Mombasa - Domestic		315	315	330	165	217	170	134	287	400	386
Mombasa - Transit		297	297	360	165	217	170	134	287	424	386

Note: Port values are included in the totals shown for each destination.

Source: Nathan Associates

Total travel time varies by destination depending on the number of border crossing and the delays experienced at final clearance. The time at the port for containers is longer than for bulk because the bulk is generally loaded into trucks at the quay, cleared customs and taken out of the port immediately. Regarding the average travel speed for the shipment from the port to the destination (excluding the time spent in the port) the route to Kampala is the fastest (one border post) followed by Kigali and Kasindi (two border posts). Bujumbura (three border posts) and Nimule (two border posts) have slower border posts and inland clearance. The slowest trip is to Goma (three border posts) where cargo has to wait about two weeks to be cleared.

In terms of reliability, the port has the greatest range of variation in time in the logistics chain hence the most unreliable. Generally, road transport is the most reliable element of the transport logistics chain. As a result, the longer the travel distance the lower is the overall reliability indicator since the relative weight of the road transport reliability index increases.

Table 2-7 presents similar performance results of imports that use rail along the Northern Corriodor. The average cost per km to Kampala (US$1.72/km for a 20 ft light container) is slightly cheaper than to Nairobi (US$1.91/km). The rail rate to Kampala is slightly lower than the road rate (difference of US$0.06 per km) which confirms RVR strategy to maximize revenue of cargo they can effectively carry (given the current infrastructure and equipment constraints) by setting their rates slightly lower than the road transport. In terms of time, the time by road is faster for both Nairobi and Kampala.

Table 2-7. Northern Corridor Performance for Imports by Cargo Type and Destination, 2010 (via rail)

Destination	Distance km.	Price (US$)				Time (hours)				Reliability Indicator (%)			
		Containers		Bulk		Containers		Bulk		Containers		Bulk	
		Light	Heavy	Dry	Liquid	Light	Heavy	Dry	Liquid	Light	Heavy	Dry	Liquid
Nairobi	489	935	1,479	1,494	1,329	316	316	269	233	202	202	257	229
Kampala	1,200	2,059	3,369	3,432	3,237	462	281	415	379	138	222	177	141
Port Node*										0	0	0	0
Mombasa - Domestic		315	315	330	165	217	217	170	134	287	287	400	386
Mombasa - Transit		297	297	360	165	217	217	170	134	287	287	424	386

Note: Port values are included in the totals shown for each destination.

Source: Nathan Associates Inc.

Exports

For exports, similar tables have been prepared. Table 2-8 shows that for the export flows via road the cheapest rates are also for Kampala (US$1.75/km) and then Nairobi (US$2.02/km). These are the shortest and involve fewer delays because they only experience one border post (Malaba). The most expensive are Kasindi and Nimule that involve dangerous conditions and delays in clearance. In terms of time to complete the shipment Kasindi, Bujumbura, Nimule and Goma take about the same time. Considering the distances traveled Nimule and Kasindi are the most inefficient considering road conditions and border delays. The reliability indicator shows that the shortest trips are the most unreliable given that the impact of the port unreliability is more significant. Variations in reliability of border crossing are also reflected in the results.

Table 2-8. Northern Corridor *Performance for Exports by Cargo Type and Origin, 2010 (via road)*

Origin	Distance km.	Price (US$)		Time (hours)	Reliability Indicator (%)	
		Containers			Containers	
		Light	Heavy		Light	Heavy
Nairobi	480	971	1,500	324	326	343
Kampala	1180	2,062	3,441	395	267	353
Kigali	1661	3,864	6,588	422	250	261
Bujumbura	1903	4,913	8,441	433	244	255
Nimule	1526	5,346	7,690	431	245	256
Kasindi	1623	7,291	9,628	436	242	253
Goma	1811	4,785	8,113	429	246	257
Port Node*						
Mombasa - Domestic		270	300	313	336	354
Mombasa - Transit		260	290	313	336	351

Note: Port values are included in the totals shown for each origin.

Source: Nathan Associates Inc.

For exports via rail, Table 2-9 shows that the transport rate for Kampala (US$1.69/km for a light container) is slightly lower than for Nairobi (US$1.82/km). In terms of average speed (total travel time excluding the time in

the port), they are quite similar with Narobi slightly faster (US$4.95 km/hr) but overall quite slow. The shipment takes almost three times longer via rail than via road to Kampala and is only six cents cheaper per kilometer.

Table 2-9. Northern Corridor Performance for Exports by Cargo Type and Origin, 2010 *(via rail)*

Origin	Distance km.	Price (US$)		Time (hours)		Reliability Indicator (%)	
		Containers		Containers		Containers	
		Light	Heavy	Light	Heavy	Light	Heavy
Nairobi	489	890	1,464	412	390	258	286
Kampala	1,200	2,022	3,362	558	605	191	260
Port Node*							
Mombasa - Domestic		270	300	313	313	336	354
Mombasa - Transit		260	290	313	361	336	434

Note: Port values are included in the totals shown for each origin.

Source: Nathan Associates Inc.

When comparing imports to exports, it can be seen for example that light container exports from Nairobi by road are 30 percent cheaper and 18 percent faster. In contrast, exports by rail are 5 percent cheaper and 40 percent slower. The port charges are lower for exports (14 percent) while the processing time is longer (44 percent).

Cost and Time Comparison by Transport Alternatives

This section presents the results of the performance assessment for light containers which are generally indicative of results for other cargo types. The results are presented for imports/exports for the selected transport alternatives connecting each origin/destination and the port of Mombasa. The figures show the participation of each component (links and nodes) in the total costs and time for respective transport alternative[2].

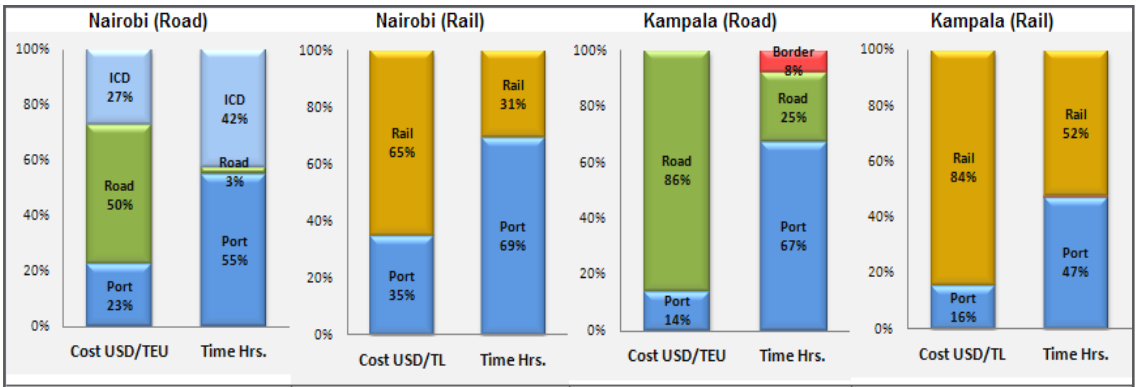
IMPORTS

Two transport alternatives were considered for the segments between Mombasa and **Nairobi**, one via road and one via rail. Figure 2-7 shows that the rail alternative is less expensive and faster than the road alternative. This is mostly due to how the customs clearance at the port is handled. The containers that will be transported by rail are identified when offloading from the ship and immediately transported to the rail yard for loading into

[2] The tables present the actual values of each component and include the estimated facilitation and extra inventory costs. The extra inventory cost is the estimated value of additional goods that corridor users have to move through the system, in order to maintain an uninterrupted supply / provision for their regular operations. All percentages in the figures are based on transport costs only.

a train along with the manifest. Customs is cleared at the ICD in Nairobi given KRA allows direct bill of lading to the ICD (it may be considered highly secure given that the ICD is operated by KPA and containers are more secure than on trucks). In terms of total cost (including freight forwarding and extra inventory costs) the rail connection to Nairobi is 27percent lower than the road and in terms of time rail is 21 percent quicker that the road. The combination of port and ICD costs account for 50 percent in the road option and 35 percent in the rail option; the remaining costs of both alternatives are related entirely to the surface transport cost. Time at the port and ICD for containers transported by road is 97 percent of the total time, while via rail is 69 percent.

Figure 2-8. Cost and Time for Northern Corridor Destinations Served by Road and Rail Transport – Imports, 2010 (light containers)



Elements	Cost USD/TEU	Time Hrs.
Port	315	217
Road	701	11
Border	-	-
Rail	-	-
ICD	380	168
Transport	1,396	396
Facilitation	300	-
Extra Inventory	593	-
Total	2,289	396

Elements	Cost USD/TL	Time Hrs.
Port	315	217
Road	-	-
Border	-	-
Rail	590	96
Lake	-	-
Transport	905	313
Facilitation	300	-
Extra Inventory	469	-
Total	1,674	313

Elements	Cost USD/TEU	Time Hrs.
Port	297	217
Road	1,801	80
Border	-	26
Rail	-	-
Lake	-	-
Transport	2,098	323
Facilitation	300	-
Extra Inventory	485	-
Total	2,883	323

Elements	Cost USD/TL	Time Hrs.
Port	297	217
Road	-	-
Border	-	2
Rail	1,612	240
Lake	-	-
Transport	1,909	459
Facilitation	300	-
Extra Inventory	689	-
Total	2,898	459

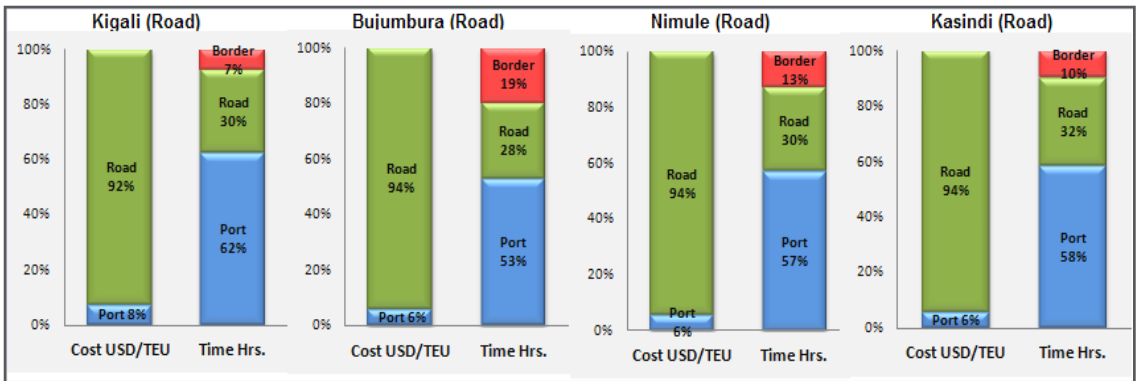
Source: Nathan Associates Inc.

There are also two transport alternatives between Mombasa and **Kampala**, one via road and one via rail. The rail connection is slightly more expensive considering the higher extra inventory cost associated to the unreliability of the rail service. In terms of time, the rail alternative takes 42 percent longer than the road alternative. In terms of distribution of cost and time, the port's share of the total cost is reduced compared to that shown above for Nairobi. The port now represents 14 percent of the cost for the road connection and 16 percent for the rail. With respect to time, the port represents 67 percent and the Malaba border post 8 percent for the road connection while the port represents 47 percent for the rail connection. This is due to the increased cost and time taken up by the longer land transport component to Kampala.

Figure 2-8 presents the results for destinations served only by road. When looking at the total cost, the most expensive destination is **Nimule** due to higher rates to account for security risks between Nimule and southern Sudan. Other expensive destinations are **Goma** and **Bujumbura** where trucks are required to wait while the cargo is cleared for up to a week. For the Mombasa – **Kigali** pair, Figure 2-8 shows that the port only represents 8 percent of the transport cost while still taking up most of the time with a 62 percent share. This

cost distribution is very similar for Bujumbura, Nimule, Kasindi and Goma. In terms of time, the port share decreases in cases where the border and inland clearance is large. Thus the port share of total transport time to Bujumbura is 19 percent, Nimule (13 percent) and Goma (35 percent). Long inland clearance times at Goma and Bujumbura are due to delays of up to a week to clear the cargo. The delays also have significant cost implications because the trucks are required to remain loaded while the clearance is completed. On the graph border represents both the time spent at the border and at the inland clearance office.

Figure 2-9. Cost and Time for Northern Corridor Destinations Served Only by Road Transport - Imports, 2010 (light containers)

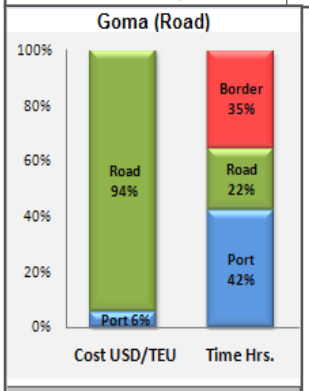


Elements	Cost USD/TEU	Time Hrs.
Port	297	217
Road	3,604	105
Border	-	26
Rail	-	-
ICD	-	-
Transport	3,901	348
Facilitation	300	-
Extra Inventory	522	-
Total	4,723	348

Elements	Cost USD/TEU	Time Hrs.
Port	297	217
Road	4,653	114
Border	-	80
Rail	-	-
ICD	-	-
Transport	4,950	411
Facilitation	300	-
Extra Inventory	617	-
Total	5,867	411

Elements	Cost USD/TEU	Time Hrs.
Port	297	217
Road	5,087	114
Border	-	50
Rail	-	-
Lake	-	-
Transport	5,384	381
Facilitation	300	-
Extra Inventory	572	-
Total	6,256	381

Elements	Cost USD/TEU	Time Hrs.
Port	297	217
Road	4,522	119
Border	5	36
Rail	-	-
Lake	-	-
Transport	4,824	372
Facilitation	300	-
Extra Inventory	558	-
Total	5,682	372



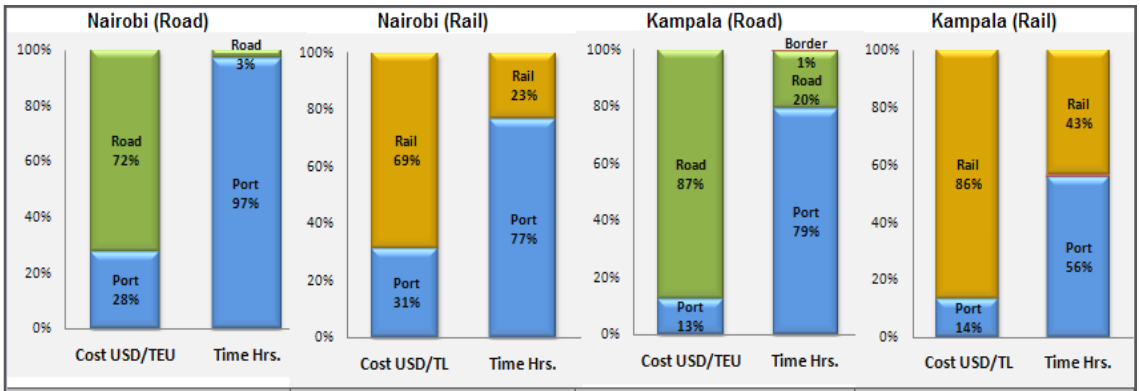
Elements	Cost USD/TEU	Time Hrs.
Port	297	217
Road	4,701	114
Border	5	180
Rail	-	-
Lake	-	-
Transport	5,003	511
Facilitation	300	-
Extra Inventory	767	-
Total	6,070	511

EXPORTS

Figure 2-9 presents the cost and time distribution for export flows. It can be seen that the rail alternative to export containers from Nairobi is slightly more expensive (1 percent) and slower (26 percent). In terms of the cost and time distribution, the port has a similar share for road and rail alternatives with 28 and 31 percent, respectively. Land transport makes up the remaining shares. In terms of time, the port takes up 97 percent of the total time for the road alternative while it takes 77 percent for rail.

Similarly for the export of containers from Kampala, the rail connection is more expensive (2 percent) and slower (41 percent). As a result of the longer distances, the cost distribution changes with the port taking 13 and 14 percent for road and rail alternatives, respectively. The port share of the time also is reduced although it still is quite significant at 79 percent for road alternative and 56 percent for rail.

Figure 2-10. Cost and Time for Northern Corridor Origins Served by Road and Rail Transport Alternatives - Exports, 2010 (light containers)



Elements	Cost USD/TEU	Time Hrs.
Port	270	313
Road	701	11
Border	-	-
Rail	-	-
ICD	-	-
Transport	971	324
Facilitation	300	-
Extra Inventory	485	-
Total	1,756	324

Elements	Cost USD/TL	Time Hrs.
Port	270	313
Road	-	-
Border	-	-
Rail	590	96
Lake	-	-
Transport	860	409
Facilitation	300	-
Extra Inventory	613	-
Total	1,773	409

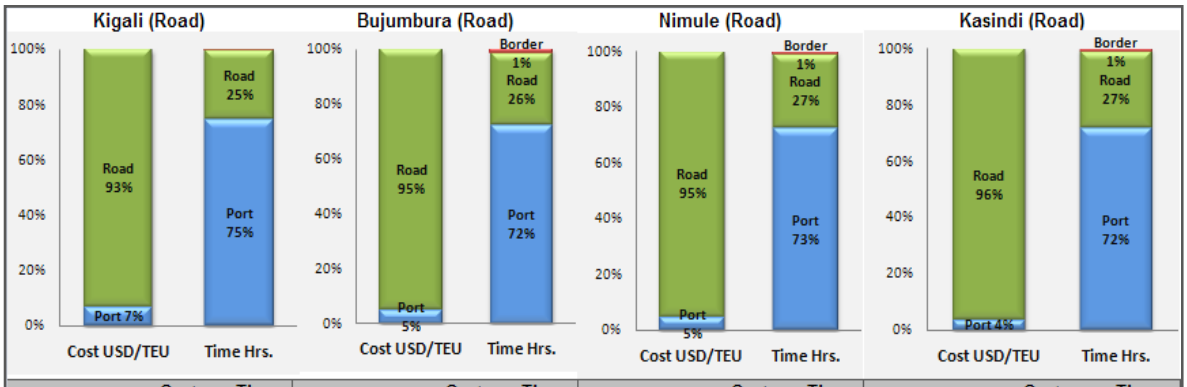
Elements	Cost USD/TEU	Time Hrs.
Port	260	313
Road	1,801	80
Border	-	2
Rail	-	-
ICD	-	-
Transport	2,061	395
Facilitation	300	-
Extra Inventor	593	-
Total	2,954	395

Elements	Cost USD/TL	Time Hrs.
Port	260	313
Road	-	-
Border	-	1
Rail	1,612	241
Lake	-	-
Transport	1,872	555
Facilitation	300	-
Extra Inventor	833	-
Total	3,005	555

Source: Nathan Associates Inc.

Figure 2-10 shows the results for origins served only by road for exports. When looking at the total cost, the most expensive origins are Kasindi due to low volumes and Nimule due to higher rates to account for security risks. Other less expensive origins are Goma and Bujumbura due to their distance from the port and with Kigali being the lowest. For the Kigali- Mombasa pair, Figure 2-10 shows that the port only represents 7 percent of the transport cost while still taking up most of the time with a 75 percent share. This cost distribution is very similar for the Bujumbura, Nimule, Kasindi and Goma. In terms of time the port share is also very similar for all origins because the impact of the border and inland clearance is minimal.

Figure 2-11. Cost and Time for Selected Northern Corridor Origins Served by Road Transport - Exports, 2010 (light containers)

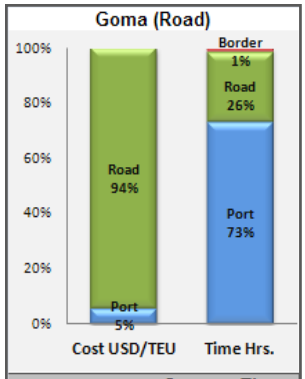


Elements	Cost USD/TEU	Time Hrs.
Port	260	313
Road	3,604	105
Border	-	2
Rail	-	-
ICD	-	-
Transport	3,864	420
Facilitation	300	-
Extra Inventor	630	-
Total	4,794	420

Elements	Cost USD/TEU	Time Hrs.
Port	260	313
Road	4,653	114
Border	-	6
Rail	-	-
ICD	-	-
Transport	4,913	433
Facilitation	300	-
Extra Inventor	650	-
Total	5,863	433

Elements	Cost USD/TEU	Time Hrs.
Port	260	313
Road	5,087	114
Border	-	4
Rail	-	-
ICD	-	-
Transport	5,347	431
Facilitation	300	-
Extra Inventor	647	-
Total	6,294	431

Elements	Cost USD/TEU	Time Hrs.
Port	260	313
Road	7,025	119
Border	5	4
Rail	-	-
ICD	-	-
Transport	7,290	436
Facilitation	300	-
Extra Inventor	654	-
Total	8,244	436



Elements	Cost USD/TEU	Time Hrs.
Port	260	313
Road	4,519	110
Border	5	6
Rail	-	-
ICD	-	-
Transport	4,784	429
Facilitation	300	-
Extra Inventor	644	-
Total	5,728	429

Source: Nathan Associates Inc.

Interpretation of Results

PORT OF MOMBASA

The analysis of all the different transport alternatives between the selected origins and destinations for the exports and imports along the Northern Corridor show consistently that the greatest share of the time is spent at the port of Mombasa.

Table 2-10 presents a further breakdown of the diagnostic assessment of the different components of the port node for both imports and exports. The results for imports show that containerized cargo spends most of the time in the yard and this component is also the most expensive. The components with the next share in time are the channel, the berth and customs clearance. For exports, the yard is also the most significant component followed by the berth and customs.

Table 2-10. Mombasa Port Performance (light containers)

	Imports – Light Containers			Exports – Light Containers		
Component	Price (US$)	Time (hrs)	Reliability (%)	Price (US$)	Time (hrs)	Reliability (%)
Mombasa Port	**297**	**217**	**287**	**260**	**313**	**336**
Channel	0	48	150	0	0	0
Berth	60	48	100	60	48	100
Yard	162	72	133	125	216	289
Customs	75	48	150	75	48	100
Gate	0	1	100	0	1	100

Source: Nathan Associates

Ship waiting in Mombasa is often three to four days. Crane productivity at the specialized terminal was about 10 moves/crane–hour. Since ships were mostly served by one crane, this also was the berth productivity. Larger ships, with 1,500 moves/call, are served part of the time by two cranes, reaching berth productivity of 15 moves/berth–hour. Berth productivity at the conventional terminal was not much different than that at the specialized terminal, since ships worked with their onboard cranes, usually three or four cranes at the same time, each achieving about four moves/hour. The resulting berth productivity was 13–14 moves/berth–hour[3]. The reasons for the low productivity indicated by Mombasa lines are yard congestion, traffic jam inside the terminal, equipment breakdown, shortage of equipment, lack of modern Terminal Operating System (TOS) and labor motivation [4].

LAND TRANSPORT

There potential cost and time advantages for using rail alternative where it is available. However, poor performance and inadequate rail capacity has led to most shippers (over 90 percent) using road. There is

[3] More recent observations, in October 2010, indicated berth productivity as low as 10 moves/hour.
[4] A more detailed description of the current port performance in the CDS Technical Paper E. on Integration of Ports and ICDs.

urgent need to rebuild and further develop rail capacity not only to provide effective competition with road but to increase use of rail with a view to reducing the region's total transport and trade cost.

OTHER CAUSES OF INEFFICIENCY

As highlighted in this diagnostic assessment the performance of the Northern Corridor is affected by numerous operational, policy, procedural, and administrative issues. These are summarized below and strategies for addressing these causes of inefficiency are presented in Chapter 5.

- In Kenya, vehicles licensed for transit cannot carry domestic cargo and must use prescribed transit routes. This has the effect of many return trips being empty. Similarly in Tanzania, the Revenue Authority licenses trucks for transit or domestic with the same effect.
- Domestic road transport policies in all states are aimed at deregulating market access, which has had some positive effects, but the lack of qualitative regulation has also had several undesirable consequences. These include low entry barriers leading to cut throat competition, low safety levels and poor service quality.
- Existing overloading control strategy is aimed at achieving 100 percent inspection of all commercial vehicles. There is no targeted risk management approach and no incentive to encourage truckers to self-regulate. The high intensity of checking increases journey times and provides an added incentive for corruption. Differences in national limits complicate cross-border operations. There is also no regional consistency in terms of the frequency of checks as some states (Burundi, Rwanda) have no existing weighbridge infrastructure.
- The Northern Corridor, as is the case for Central Corridor, suffers from serious delays caused by informal stops and check points on the route. Some are officially sanctioned and some are created to collect payments to police, transit authorities and local communities. Without sufficient law enforcement vehicles, stationary control points to check for driving licenses, vehicle registration, vehicle road worthiness certificates and to inspect vehicles for contraband and trafficking are essential. Nevertheless, unofficial stops delay transit transport and add cost to transport which is passed on to the shipper. In other cases, they are payments to avoid regulatory control, such as payments especially on the Northern Corridor to avoid overloading regulation.
- Insufficient use is made of customs tools to expedite processing. Clearance modernization is being implemented at the national level and the extent of implementation is varied. Tools include risk management, accredited economic operators, customs bonds and control points, preclearance and so forth.
- Failure to implement an effective transit regime impedes transit movement in terms of cost, time and reliability. Many aspects of a transit regime exist, but have not been fully implemented. Common vehicle regulations have been issued, but not fully implemented and there are current efforts to change again. Road worthiness standards have been promoted, but there is lack of trust in the systems of other EAC partner states. Customs declaration have been simplified and harmonized, but each country still requires its own form under national insignia.

3. Central Corridor Infrastructure and Performance

This chapter presents the results of the diagnostic audit of the performance of the Central Corridor that was conducted from November 2009 through September 2010. The diagnostic audit was performed using the software and audit methodology called *FastPath*® to apply to transport logistics chains to measure the current state of performance (in terms of time, cost, and reliability) and to identify bottlenecks and potential solutions[1].

The chapter commences with a description of the existing Central Corridor infrastructure and its conditions by mode. This is followed by the diagnostic assessment of the corridor's performance.

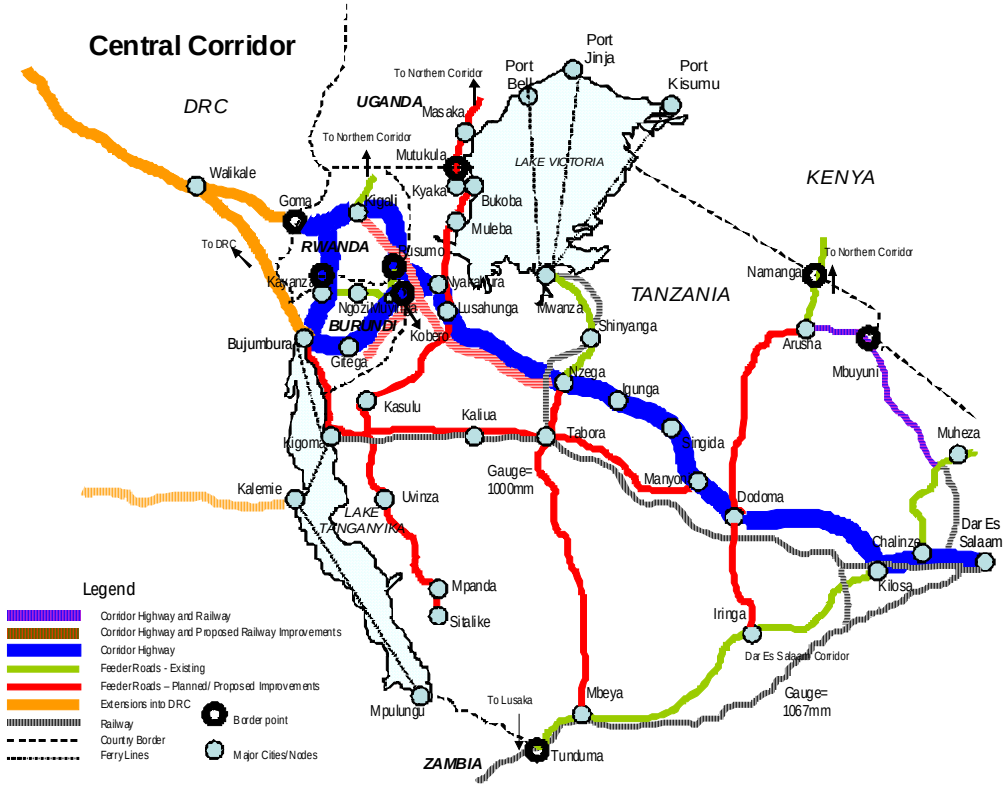
Existing Infrastructure and Conditions

The Central Corridor connects the Port of Dar es Salaam to markets in Tanzania, Burundi, Rwanda, Uganda and DRC (See Figure 3-1). It connects the entire East Africa Community to a major regional port for overseas trade and connects the EAC partner states and DRC for intra-regional trade and personal mobility. The Central Corridor connects all of central and northern Tanzania itself with branches to Burundi, Rwanda and Uganda and through them to DRC. Several road sections have just been paved within the last four years, making it a recent option for competitive cross border trade using the Port of Dar es Salaam. The rail network is also extensive, though in need of some rehabilitation. The railway goes to Mwanza on the southern shore of Lake Victoria where rail ferries make an 18 hour connection to Port Bell and nearby Kampala in Uganda or to Kisumu in Kenya. The railway also connects to Lake Tanganyika at Kigoma Port, for vessel connections to Bujumbura Port, Burundi and Kalemie and Uvira Port in DRC. These were previously major multimodal routes and, with better rail service, would be important again. Much of the road from Dodoma to Kigoma is not paved.

[1] *FastPath* is a proprietary diagnostic tool developed in a partnership between USAID and Nathan Associates to analyze transport infrastructure and operational inefficiencies in the transport/logistics chains serving import and export traffic. *FastPath* provides a quantitative basis for monitoring corridor performance. The audit methodology consists of surveys and questionnaires to identify bottlenecks and appropriate improvements to freight corridors.

Tanroads has begun construction of this part of the Central Corridor to make it a road and rail route. There are no rail connections to Burundi and Rwanda, but several feasibility studies have been carried out to determine the feasibility of an extension to Kigali and to the nickel deposit area of western Tanzania and eastern Burundi. The Central Corridor offers Burundi, Rwanda and the Goma/Bakavu area of DRC a shorter route to a major port. Despite its importance to the region, there are still many facilitation issues to be addressed. Competition between the Central and Northern Corridor for the traffic of the Great Lakes should improve performance on both Corridors.

Figure 3-1 Central Corridor Network



Source: Nathan Associates Inc.

PORT OF DAR ES SALAAM

The Port of Dar es Salaam has been increasing its overall vessel traffic by 3.9% per year and overall cargo traffic by 8.6% between 2000 and 2008. Total traffic through the port was 8,103,000 tons in 2009. Container traffic in TEUs has been increasing at 14.7% per annum and reached 373,548 TEUs in 2008. The container terminal at the Port of Dar es Salaam was given in concession in 2000 and realized a considerable improvement in handling and dwell times. The container terminal, however, is constrained by space limitations and increased traffic through the port led to congestion that caused deterioration in port performance indicators. It

is now using container freight stations (ICDs) to move cargo out of the port for all clearance procedures and alleviate the congestion at the Container Terminal and at the gate.

Table 3-1 Dar Es Salaam Port Traffic ('000 Tons)

Type of Cargo	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	AAGR 2000-2009
Imports											
Containerised	727.2	849.7	895.9	1,024.1	1,265.2	1,372.0	1,347.2	1,915.7	2,171.7	2,056.0	12.2%
General Cargo	699.6	585.6	586.7	500.3	652.9	548.1	701.7	557.0	588.8	657.9	-0.7%
Dry Bulk	376.9	503.1	544.8	719.1	839.1	972.3	1,115.9	1,129.4	904.3	1,270.1	14.5%
Liquid Bulk	1,254.2	1,573.8	1,603.4	1,798.3	2,006.4	1,936.6	2,060.7	2,074.4	2,142.3	2,645.6	8.6%
Total	3,057.9	3,512.2	3,630.7	4,041.8	4,763.5	4,829.0	5,225.4	5,676.5	5,807.2	6,629.6	9.0%
Exports											
Containerised	458.9	458.7	459.5	604.0	673.3	801.2	757.0	987.4	1,068.1	1,067.4	9.8%
General Cargo	219.9	168.4	211.2	238.0	187.4	172.8	205.6	282.4	122.0	148.2	-4.3%
Liquid Bulk	66.3	38.6	53.6	39.5	54.3	77.2	41.4	47.2	52.6	43.8	-4.5%
Total	745.1	665.8	724.3	881.4	914.9	1,051.2	1,004.0	1,317.0	1,242.7	1,259.4	6.0%
Imports and Exports	**3,803.0**	**4,177.9**	**4,355.1**	**4,923.2**	**5,678.5**	**5,880.2**	**6,229.4**	**6,993.5**	**7,049.9**	**7,889.0**	**8.4%**
Transhipment	31.5	93.4	168.7	245.8	375.6	404.9	428.1	433.8	354.5	213.0	23.6%
Bunkers	1.6	0.3	0.7	-	-	-	-	-	16.8	0.9	-5.7%
Total Traffic	**3,836**	**4,272**	**4,525**	**5,169**	**6,054**	**6,285**	**6,657**	**7,427**	**7,421**	**8,103**	**8.7%**
Container TEU's	124.6	141.7	141.4	167.7	199.3	228.7	240.6	334.0	373.5	353.7	12.3%

Source: TPA.

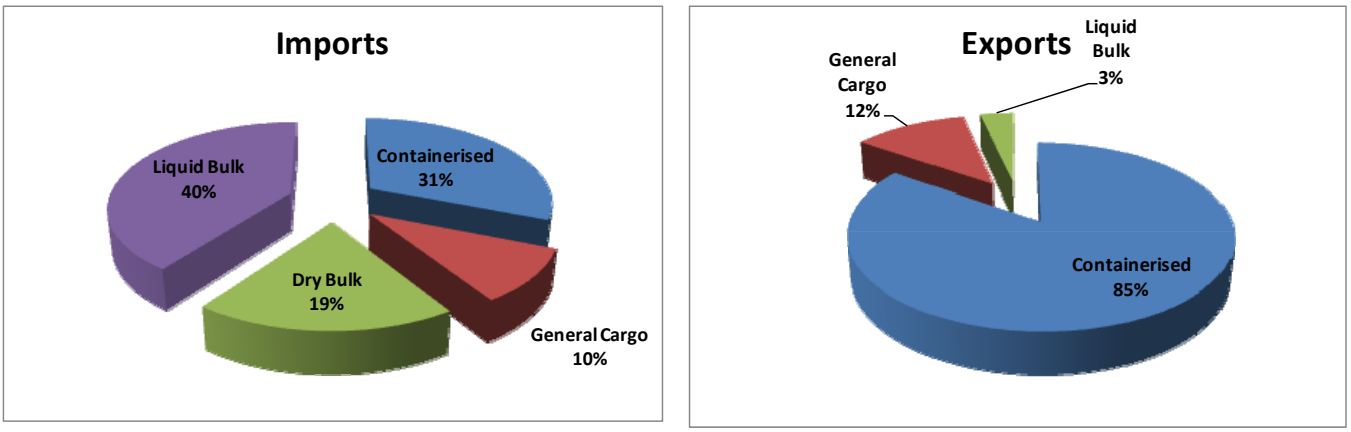
Figure 3-2 illustrates the current design and usage of the port terminals. Current container operation is at Berth 8-11, operated by the concessionaire Tanzania International Container Terminal Services Ltd (TICTS). The rapid growth of containerized traffic has meant that terminal 8 was added to the container terminal operated by TICTS and Tanzania Ports Authority has handled some containers at berth 7 and berth 4. In addition, the container yard has also occupied some of the storage behind the break bulk terminal. These factors have led to the plan for an additional container terminal at berth 13 – 14. The liquid bulk terminal is currently upstream of TICTS, and also operating well over capacity. The construction of a new single point mooring, to replace the old one which is no longer functioning, will help to alleviate this problem.

Figure 3-2. Layout of Dar es Salaam Port

Source: Tanzania Port Master Plan.

In 2009, imports constituted 82% of the total traffic through the port. Of imports, 40% is liquid bulk, 31% is containerized cargo, 19% is dry bulk and 10% is general cargo. Exports constituting 18% of total traffic through the port, were 85% containerized. Additionally, 3% is liquid bulk and 12% is general cargo.

Figure 3-3. Dar Es Salaam Traffic by Cargo Type, 2009

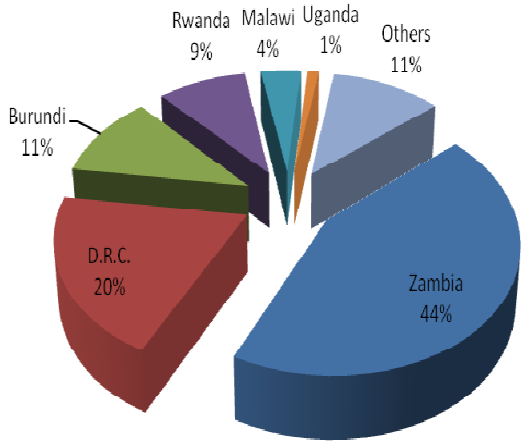


Source: TPA.

About 40% of the cargo through the port of Dar es Salaam is transit traffic, hence a significant part of port business. The port of Dar es Salaam serves two major corridors, the Central Corridor already defined and the Dar es Salaam Corridor which serves southwestern Tanzania, Zambia Malawi and DRC. It is one of the major outlets for the copper belt handling export of copper, cobalt and other minerals and import of equipment, parts and supplies for

the mines, in addition to meeting the demand of this region for consumer goods. As illustrated, currently 64% of the transit traffic is on the Dar es Salaam Corridor, while about 36% is on the Central Corridor. Different parts of DRC use both routes for overseas traffic, making this percentage approximate. Both catchment areas for the port rely on several corridors making for a competitive transport environment. The percentages reflect the distance from the port. Of the other EAC partners, Burundi is the closest and Uganda the farthest.

Figure 3-4 Transit Traffic Distribution 2009



Source: TPA.

Table 3-2 provides basic data on the port of Dar es Salaam the size, equipment, access and current operational features and plans. A major problem is the depth of the harbor which restricts the vessel size and adds the turnaround time for vessels and reduces berth usage. Part of the port development plan is to dredge the channel and terminal to allow the port to achieve economies of scale from larger vessels. Access for both road and rail is poor and needs to be addressed. Port congestion has been a major problem affecting wait time to enter the channel, time to unload and load, and dwell time in the port. The introduction of ICDs to act as extensions of the port in clearing domestic imports has reduced all these performance indicators, but as the following section will illustrate the port still needs to address the time factors. Dwell time has been reduced to 12 days, but should still be reduced substantially.

Table 3-2. Characteristics of the Dar es Salaam Port

Item	Description
Natural Catchment Area	All Tanzania, Great Lakes region, Uganda, Zambia, DRC, Malawi
Volume of freight – total, import, export mtpa	8.1 mtpa in 2009
No of berths, depths	11, up to 10.1m, total length 550m
Container Berths	3 – 12Ha, operated by TICTS / Hutchinson
Container Equipment , Capacity	250 000, congested, 3x40t gantries, 13 rubber tired cranes, 14 front end loaders, 13 forklifts
Container Vols - total, Imp, Exp - TEUs	350,000, mostly imports
Bulk berths & equipment	Bulk grain, including grain bagging facilities, no mineral berths
Marine Access	Via 2 km channel
Road Access	Road condition and access poor at port, congested
Rail Access	Via TAZARA and TRL – poor service and access
Current Operational Status	Fully operational, congested, delays, import dwell time 12 days, ship waiting 10 day before, now zero
Specific Problems / Issues	Congestion in port and city, 12 inland terminals licensed, 5 operational, road and rail access poor
Planned Developments	Container terminal to be extended berths 13 &14, maintenance and capital dredging required. Additional Inland Container Freight Station being planned
Intervention / Assistance Required	Assistance with operational planning and systems, funding required. Port master plan completed in 2008

Source: Tanzania Port Master Plan.

Container Facilities

Containers are handled in Dar es Salaam in two types of facilities: (1) Specialized Container Terminals and (2) Conventional Terminals. Once containers are unloaded they are moved to stacks, originally all within the container terminal. Due to congestion and the use of ICDs to extend the capacity of the port, by 2008 only about 37% of containers were actually kept in the TICTS container yard, while 32% were kept at the ICDs during clearing and the remainder elsewhere in the port. The specialized terminal handles up to its capacity and then off-loading is scheduled with TPA. In interviews with one of the shipping lines, he indicated a preference for waiting for TICTS rather than using a conventional berth because of the greater efficiency. Table 3-3 below shows the continuous growth in containerized imports with an average growth rate between 2000 and 2009 of 12.7% and of exports of 10.4%. It also indicates the volume of empties handle by the port. Interview indicated that there was sufficient depot storage for empties at the port of Dar es Salaam.

Table 3-3. Dar es Salaam Container Traffic 2000-2009 ('000 TEUs)

Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	AAGR 2000-2009
Imports											
Full	56.7	60.3	68.6	86.1	99.6	108.8	121.6	147.0	161.4	165.9	12.7%
Empty	5.5	5.3	4.5	4.0	5.9	5.6	3.2	0.7	0.6	1.7	-12.4%
Exports											
Full	26.1	27.7	28.3	39.2	43.9	53.3	49.1	54.3	58.7	63.7	10.4%
Empty	34.4	38.9	40.0	38.4	49.8	59.8	68.8	81.0	95.7	106.0	13.3%
Transhipment											
Full	2.0	6.3	24.8	36.6	55.6	61.0	60.4	56.8	38.2	16.4	26.5%
Empty	-	-	-	-	-	-	-	-	-	-	-
Total											
Full	84.7	94.3	121.7	162.0	199.2	223.0	231.1	258.1	258.3	246.1	12.6%
Empty	39.9	44.1	44.5	42.5	55.7	65.3	72.0	81.8	96.3	107.7	11.7%
Grand Total	**124.6**	**138.4**	**166.2**	**204.4**	**254.9**	**288.4**	**303.1**	**339.9**	**354.6**	**353.7**	12.3%

Source: TPA.

Presently, Dar es Salaam has six licensed ICDs, with five additional ICDs under development. We visited two ICDs, TRH and Azam. TRH is the largest of Dar es Salaam's ICDs and closest to the port, located about 2 km away. This ICD began operations in 2007 with 17 ha and has the potential to grow to 35 ha. In comparison, Dar es Salaam's specialized container terminal only has about 13 ha. The main ICD's facilities include a large container yard based on concrete pavers, modern reachstackers (RS), warehouses, Customs inspection shed and administration building, which also has offices for Customs and TPA. The complex is surrounded by security fence with steel gates and around-the-clock security. Azam is relatively small ICD, with a total area of about 4 ha, located about 7 km away from the port. Like TRH, the facilities, including container yard, sheds and offices are new and well maintained. Both ICDs have short access roads connecting them to the main highway leading to the port. Interestingly, both access roads are unpaved, with deep potholes, which turn muddy during rainy days. These roads also often get congested. Both ICDs declared their desire to finance the improvement of these roads but are not allowed by the City. Both ICDs are well kept.

CENTRAL CORRIDOR ROAD SYSTEM

The Central Corridor was originally a combination of paved and gravel road links. The Central Corridor Road Project, which is nearing completion, involved rehabilitation (517 km), construction (527 km) and routine maintenance (200 km). Construction is planned and managed by TANROADS, which also designs and manages the weighbridges to control overloading on the route. When weighbridges where placed in the newly constructed/rebuilt Central Corridor in 2006, TANROADS envisioned about 7 weighbridges at points where additional traffic enters the corridor. There are now 7 fixed and 3 mobile weighbridges on the route, as well as customs and police checkpoints. All of these affect the flow of traffic on the

route. Transport demand has been increasing rapidly and the choice of a fully paved route to the Port of Dar es Salaam offers a shorter route for Rwanda and Burundi than the Northern Corridor to Mombasa. Assuming good road, rail and port performance, it interjects competition between the Central and Northern Corridors that should drive cost down and facilitate improvements.

An assessment of Central Corridor road network was carried out by Aurecon for the East African Transport Strategy and Regional Road Sector Development Program conducted for the EAC in 2010. This assessment consisted of two major elements: road capacity and road condition.

Road Capacity and Other Characteristics

The evaluation of road capacity was based on level of service standards defined in the Highway Capacity Manual. Level of service with indices ranging from A (best operating conditions) to F (worst operating conditions). The best operating conditions entail free flow high (design) average speeds and able to overtake easily.

Table 3-4. Characteristics of the Central Corridor Road Network

Corridor Name	Northern Corridor						Corridor Length (km)	1898 km		
Corridor Description	Mombasa-Voi-Eldoret-Bigiri-Kamala-Masaka-Kigali-Kibuye-Kayanza-Bujumbura									
Lanes	1	2	Travel Speed	70km/h	80km/h	90km/h	Road Reserve	10.6m	17.6m	
Length	1738 km	161 km	Length	852 km	890 km	158 km	Length	1738 km	161 km	
	91.5%	8.5%		45%	47%	9%		92%	9%	
Terrain	Level	Rolling	Mountain	Land-use	Urban	Rural	Surface	Paved	Unpaved	
Length	131 km	1718 km	50 km	Length	329 km	1570 km	Length	1896 km	3 km	
	7%	91%	3%		18%	83%		100%	1%	
Number of Accesses / km	0 Accesses	1 Access	2 Accesses	3 Accesses	≥ 4 Accesses					
Length	1634 km	121 km	88 km	57 km	0 km					
	87%	7%	5%	3%	0%					
Traffic Volumes*	0-50	51-100	101-200	201-300	301-400	401-500	501-750	751-1000	1001-1500	1501-2000
Length	55 km	106 km	784 km	466 km	326 km	38 km	52 km	70 km	5 km	0 km
	3%	6%	42%	25%	18%	2%	3%	4%	1%	0%
Corridor Performance (Level of Service)	A	B	C	D	E	F				
	Very Good	Good	Acceptable	Acceptable	Poor	Very Poor				
2010 (Base Year) Scenario	111 km	148 km	138 km	711 km	812 km	19 km				
	6%	8%	8%	38%	43%	2%				

Source: Aurecon, East African Transport Strategy and Regional Road Sector Development Program, 2010.

Road Conditions

Data obtained from the Primary and Secondary sources were used to determine the current condition status of the pavement structures of the EAC corridor. The first and foremost indicator of the pavements' condition was pavement roughness, also referred to as riding quality. This objective measurement describes the distortion of the pavement surface which contributes to an undesirable or uncomfortable ride. The unit for roughness is the International Roughness Index (IRI) ranging between 0 (Good) to 20 (Very Poor).

- Paved roads are typically maintained at roughness levels between 2 and 6 IRI. These roads require no immediate remedial action and are considered to be in a sound state.
- Paved roads that are approaching a severe state have typical roughness levels between 6 and 10 IRI. These roads are in warning state.
- Paved roads in a severe condition, requiring immediate remedial action have typical roughness levels above 10 IRI.

The second indicator of pavement condition was an overall condition index, also referred to as the Visual Condition Index (VCI). Visual assessments are a cost effective method of gathering information to describe the functional and structural condition of a road's pavement.

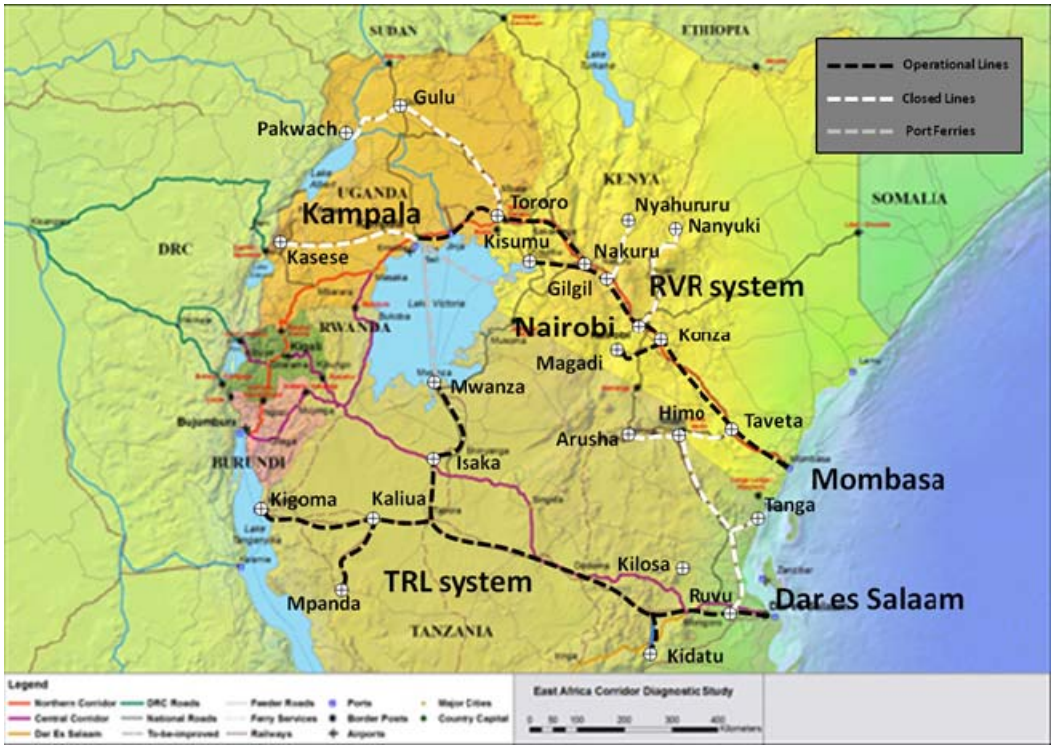
Figure 3-5. Condition Assessment of Central Corridors Roads

Source: Aurecon, East African Transport Strategy and Regional Road Sector Development Program, 2010.

RAIL SYSTEM

The Central Corridor railway system operates within Tanzania as the Tanzania Railways Limited, (TRL). The concession operator was Rites from India and railway assets are controlled by RAHCO, which is a state owned company. The system consists of about 2600 km of 1000 mm gauge track, generally light 30 kg/m rail with 15 t axle loads. Some sections have gradually been upgraded to 45 kg/m and 18 t axle loads. The condition of the equipment fleet of 109 locomotives and 1670 wagons is uncertain, given the operating cash flow problems since it was given in concession. Due to the poor condition of the track, speed restrictions of between 13 km/hr and 50 km/hr are imposed on many sections. Train turnaround time between Dar es Salaam and Mwanza or Kigoma is typically 18 days, rather than the scheduled 10 days, with the consequent increase in operating costs.

Figure 3-6. Existing Central Corridor Rail System



Source: Nathan Associates Inc.

LAKE TRANSPORT

Lake Victoria ferries serve to provide another connection between Kenya, Uganda and Tanzania. Ferries link through the port of Kisumu (Kenya) to Kenya's railway and road network, through Mwanza (Tanzania) to the Central Corridor and Tanzania's railway system, and through Port Bell and Jinja (Uganda) to the Northern Corridor and Uganda's road network.

The system is currently suffering from outdated ports, lack of equipment at the ports and an extremely old fleet of small ferries. The current system is based on rail ferries which can handle 22 wagons on a roll on-roll off basis at Kisumu and Port Bell (15 minutes from Kampala). It was previously use to carry fuel and other goods to Kampala to overcome the necessity of locomotive and train reconfiguration at the Uganda border. Kenya has put its ferry back into commission and Uganda is rehabilitating their two ferries to revive this service and the one to Tanzania. There is also active private vessel haulage among the ports on Lake Victoria.

Maritime and port operations on Lakes Tanganyika and Victoria have a significantly different structure and modus operandi. Lake Victoria has a much more modern and viable merchant fleet particularly with respect to passenger and RoRo ferry operations. They also have a more energetic private sector operating both shipping and port facilities. The public rail and port

sector, however, lags well behind the private sector in developing its facilities and providing modern port services to the merchant fleet and shipping community. Paradoxically, on Lake Tanganyika with the exception of a few new constructions the shipping fleet is very old and antiquated while the ports, particularly Bujumbura, are reasonably well developed and have been investing in their infrastructure to upgrade their facilities.

Vessels

The "Integrated Transport Strategy – Lakes Tanganyika and Victoria" study developed by Marine Logistics Ltd. (MLL) for the Central Development Corridor (CDC) Spatial Development Initiative (SDI) project, February 2009 identified 23 vessels operating on Lake Tanganyika of which 56.5 percent were 50 years or older and six were laid up or inoperable. There were only three operating tugs on the lake, one in the Port of Kigoma and two in the Port of Bujumbura. Of the eight dry cargo barges in the fleet, only two have a total cargo capacity of 1,014 tons. In addition, only three general cargo vessels with a total capacity of 1,500 tons and three combo carriers with a total capacity of 74 TEUs were available for handling general or container cargo. Bujumbura was the sole port that had the capacity for handling LoLo containers in the northern part of the lake. Most of its recent container traffic was coming from Zambia due to the four months closure of the rail service to Kigoma. By May 2010, the Port of Kigoma was expecting a new mobile harbor crane capable of handling containers in September. However, the design and age of the wharf will limit its effective use to less **than** 100 m of the quay.

On Lake Victoria the situation is a little different. The vessels are not nearly as ancient as those on Lake Tanganyika (with the oldest dating to 1938). However, according to the MLL study, of the 42 vessels that were listed ten were laid up. There were 13 operating passenger/general cargo vessels, and seven relatively new car ferries that were oriented primarily to the local markets. There were only two general cargo vessels of less than 200 GRT and three small tankers serving the transit markets.

Port Facilities

Since most of the main Lake Victoria ports were formerly or currently owned and operated by the railroads, the primary means of transporting transit cargo was via an integrated rail/ferry system in which each port was equipped with rail link facilities for mooring and loading train wagon ferries. Five of these vessels were built between 1964 and 1979 of which one has sunk, two are laid up (Uganda), one has been reconditioned and waiting for Lloyds Certification (Kenya) and one is in operation (Tanzania). They are capable of carrying 19 rail wagons each (equivalent to 38 TEUs). During the first semester of 2010, the Tanzanian ferry has not been in operation because of repairs to the mainline rail track between Dar-es-Salaam and Dodoma.

Of the six ports only Bujumbura has made a major investment in the port infrastructure in the last two decades. The main quay, which was built between 1939 and 1957, was rehabilitated in 1990 in which the 100 m wide apron was resurfaced in concrete and new crane rails and bollards were installed. In addition, the 50 year old rail mounted derrick cranes were

rehabilitated in 2001. The only other infrastructure project under way is the dredging of the Port of Kigoma and the rehabilitation of its slip ways.

With the exception of Bujumbura, the ports have some serious infrastructure problems. The Ports of Kigoma and Mwanza have bi-level pile supported quays in which the bottom water side level is only six meter wide. The top level, which is approximately one meter higher, was added in response to a rise in water level by simply adding a facing wall on top of the old deck and filling in dirt and gravel behind it. The Port of Kisumu essentially did the same thing but topped the entire original apron so that the quay is at one level, albeit surfaced with gravel. In all cases the original quays or piers, as in the case of Port Bell and Jinja, were built between 1920 and 1930. Consequently there are serious questions regarding their weight bearing capacity and suitability for supporting heavier cranes. On Lake Victoria, the rail links at each of the ports are relatively well maintained except for Jinja which has deteriorated to the point of being unusable.

Equipment

Bujumbura is the best equipped of all the ports with four operating 5 ton rail mounted shore cranes, one fixed and one mobile container crane of 50 ton capacity, two 25 ton and twelve 4.5 ton forklifts, one yard tractor and one 80 ton weigh bridge. Kigoma is also relatively well equipped; it has two of three 60 year old rail mounted derrick cranes working and a 105 m wide rail mounted bridge crane of 35 tons operating in the container yard, three working yard tractors, and ten working forklifts.

With regards to the four ports on Lake Victoria, all are inadequately equipped. In Mwanza the two 5 ton jetty cranes were manufactured in 1929 and only one is still operational at a max of three tons. They have only one operating forklift which is used in the warehouse. All ship shore operations are primarily done using manual labor. There is one farm tractor used for shunting the rail cars on and off the wagon ferry. They also have two relative new floating dry docks that are fully functional. The largest is 100m x 24m with a lifting capacity of 2,100 tons while the smallest is 70m x 13m with a lifting capacity of 860 tons. However, the machine and repair shops are rather limited in scope and equipment.

Kisumu, Port Bell and Jinja do not have any working cargo handling equipment at all and consequently do not handle containers unless they are on a rail wagon. When a crane is needed it has to be rented from the associated towns. Kisumu, however, does have a built in functional dry dock 100m x 30m with a 6m draft. It is equipped with a swinging gate that is opened and shut using a 250 horse power tug built in 1958. The facility also includes one slipway under rehabilitation and one that is beyond use. It also has the most fully equipped machine, carpentry, and fabrication shops of the ports that were visited. The Port of Kisumu is also associated with a dry port operated by the KPA that is approximately three kilometers from the port.

BORDER CROSSINGS

Border crossings within the region are characterized by poor infrastructure, inadequate coordination and congestion. The East African Community has committed to introducing one stop border post (OSBP) operations at all its main internal borders and is also introducing OSBP at borders with countries outside the EAC. The regional OSBP legal framework being developed by the East Africa Community with support from JICA provides OSBP legal jurisdiction and structure, operating principles and methods of coordination. Through this framework, common practices will be introduced and harmonized throughout the Community. The OSBP Act approval process has involved all border agencies as has the joint planning for the new OSBP border facilities. Continuing support for this coordination is critical.

On the Central Corridor borders, support is being given by several cooperating partners. On the border between Tanzania and Rwanda at Rusumo, there is need for a new bridge to replace the single lane one, which is there and not built to handle the maximum allowable weights on the route. JICA is supporting the construction of a two-lane bridge and new OSBP facilities at this border. From Kigali, the Central Corridor continues to DRC. The African Development Bank as part of the East Africa Trade and Transport Facilitation Project is financing a feasibility studies for OSBP at Gisenyi/Goma on the Rwanda/DRC border. The border between Tanzania and Burundi at Kabanga/Kobero is also planned as an OSBP and TradeMark East Africa is planning a feasibility study for this border. There is at present no commitment regarding the borders between Burundi and DRC, where traffic is relatively light. New OSBP border facilities at Mutukula between Tanzania and Uganda are funded by the World Bank also under the East Africa Trade and Transport Facilitation Project. JICA is taking the lead under the Infrastructure Consortium for Africa in coordinating support for the development and implementation of OSBP.

Cargo clearance can be done at the border, but in most cases is done at inland clearance centers, mostly in capital cities. Where clearances are not done at the border, the border clearance is generally done in a few hours. Nevertheless, the process is not completed and the 1-3 day final clearance should be seen as part of the overall process. In the following discussion of corridor performance, the term border is used to describe both the cost and time spent at the border plus the average time at the final inland clearance point. In terms of improving facilitation on the Central Corridor, both control points are important, as well as control of vehicle movement on the Corridor.

Most of the trucks operating on the route are Tanzanian-owned since it is easier for them to arrange cargo from the port and then seek return hauls in the other countries. Road transporters from the land-locked countries generally have an office or a partner that arranges for return haulage, mostly to their own country. The cargo is significantly imbalanced in favor of imports and many return hauls are empty. The Tanzanian road transporters have a very active association, the Tanzanian Truck Owners Association (TATOA), which represents their interests at the port and with government agencies concerning the regulations that affect their

operations. Freight forwarders are represented with national and regional associations. These associations will be important "drivers" for more effective transport facilitation measures on the Corridor.

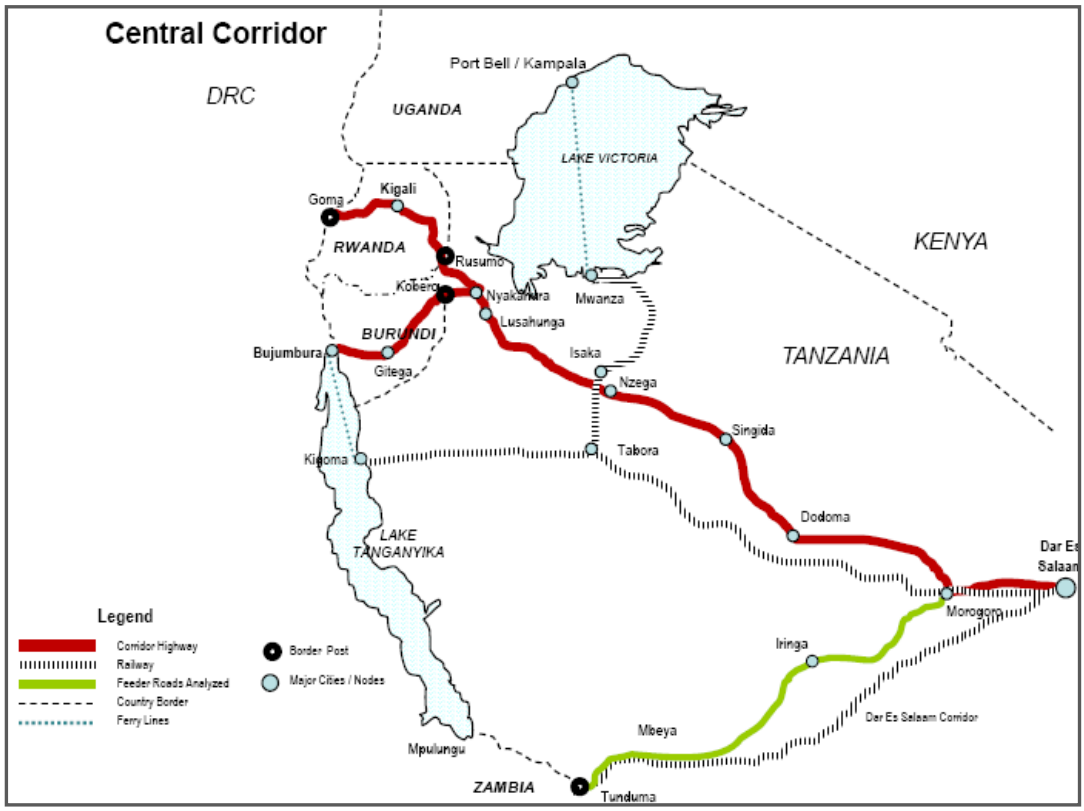
Corridor Performance

The performance assessment provides a framework for the detailed analysis conducted through the use of our logistics performance assessment toolbox, FastPath. This is done based on three variables that define the performance of transportation networks: cost, time and the reliability of completing the shipment. The cost results are referred to costs paid by the users of the transport corridor; therefore these include a normal profit and they can also be referred as prices.

For the analysis purposes the Central Corridor has been defined according to Figure 3-7 shown below. The main origins/destinations of cargo are the port of Dar es Salaam, Kampala (Uganda), Bujumbura (Burundi), Kigali (Rwanda) along the main corridor. Additional origins/destinations are Mwanza (Tanzania), Goma (Rwanda connection to DRC). These origins/destinations were selected based on their importance as population and industrial centers as well as consolidation and redistribution centers.

The transport network is divided in nodes and links each representing different physical and operational characteristics. The nodes are marine ports, ICDs, border posts, and lake ports that are necessary to connect links with different characteristics. The port node contains information regarding five elements within the ports: the channel, the berth, the yard, customs clearance and the gate. Other nodes contain information specific to their physical characteristics and their operations. The links represent road, rail and lake segments with unique characteristics. They contain modal information on capacity, topography, price and travel time that defines its performance.

Figure 3-7. Links and Node Schematic of the Central Corridor



Source: Nathan Associates Inc.

OVERVIEW OF CORRIDOR PERFORMANCE

Imports

Table 3-5 shows the price, time and reliability of each of the destinations from the port of Mombasa for imports of different type of cargo by handling served by road. The information listed includes all costs and process times experienced by the shipments at they proceed through the transport networks including ports, ICDs, border posts, inland customs clearance (at capital cities), facilitation costs at weighbridges and check points and rest stops.

The port related charges and times (included in the information by destination) are specifically listed at the bottom of the tables because it makes it easier to assess their significant contribution to the delays experienced and also to observe that in terms of price the land transport represents the highest proportion.

Table 3-5. Central Corridor Performance for Imports by Cargo Type and Destination, 2010 (via road)

Destination	Distance (km.)	Price (US$ TEU)			Time (hours)			Reliability Indicator (%)			
		Containers (TEU)		Bulk (TL)	Containers	Bulk		Containers		Bulk	
		Light	Heavy	Dry/Liquid	Light/Heavy	Dry	Liquid	Light	Heavy	Dry	Liquid
Mwanza	1129	1,618	2,765	2,511	362	467	371	198	215	186	177
Goma	1640	3,618	5,418	5,161	565	670	574	135	145	144	136
Kigali	1495	3,314	4,918	4,661	420	525	429	171	186	166	155
Bujumbura	1567	4,369	6,961	6,704	440	545	449	163	177	159	147
Port Node*											
Dar Es Salaam		319	319	62	291	396	300	245	266	217	217

Note: Port values are included in the total shown for each destination.

Source: Nathan Associates Inc.

Table 3-5 shows the price, time and reliability of each of the destinations served by road from the port of Dar es Salaam for imports of different types of cargo by handling. For example, heavy containers going to Bujumbura are subject to a total cost US$ 6,961 per TEU, of which US$ 319 are port costs; it takes 149 hours to reach Bujumbura after staying at the port for291 hours, thus the total time of the segment is 440 hours; the reliability of the segment indicates that the expected delays are within 177 percent range above or under the average time. Generally, the price for heavy containers, dry and liquid bulk is similar. The table shows that the price goes up with distance (lowest rate per km is to Mwanza at US$ 1.43/km for light containers). There are destinations with higher rates that account for longer delays to clear customs, while the cargo remains loaded in the truck; this is the case of Bujumbura at US$ 2.70/km and Goma at US$ 2.21/km.

Total travel time varies by destination depending on the number of border crossing and the delays experienced at final clearance. The time at the port for containers is longer than for bulk because the bulk is generally loaded into trucks at the berth, cleared customs and released from the port immediately. If we calculate the average travel speed (excluding the time at the port) we see that the route to Mwanza is the fastest (no border post) followed by Kigali and Bujumbura (one border posts). The slowest trip is to Goma where cargo has to wait about one week to be cleared after having crossed two border posts.

The reliability indicator reflects the range of variations in time with respect to the average time it takes to complete each stage of the logistics chain. A higher value for the reliability indicator signifies a greater variation and more likelihood of long delays. The port has the greatest range of variation in time in the logistics chain hence the most unreliable. Generally, road transport is the most reliable element of the transport logistics chain. As a result, the longer the travel distance the lower is the overall reliability indicator since the relative weight of the road transport reliability index increases.

Table 3-6 presents similar performance results for imports that use rail along the Central Corridor. The average cost per km to Mwanza (US$ 1.46/km for a container) is less costly than to Kampala (US$ 1.59/km) and Bujumbura (US$ 1.66/per km).

Table 3-6. Central Corridor Performance for Imports by Cargo Type and Destination (via rail or rail and lake)

Segment	Distance (km.)	Price (US$ TEU)		Time (hours)		Time Variation (%)	
		Containers	Bulk	Containers	Bulk	Containers	Bulk
		Light/ Heavy	Dry/ Liquid	Light/ Heavy	Dry/ Liquid	Light/ Heavy	Dry/ Liquid
Kampala	1,568	2,507	2,250	530	539	150	152
Mwanza	1,229	1,794	1,537	411	420	192	193
Bujumbura	1,446	2,403	2,146	524	533	152	154
Port Node*							
Mwanza Port - Port Bell		132	132	48	48	150	150
Dar Es Salaam		319	62	291	300	266	266

Note: Port values are included in the total shown for each destination.

Source: Nathan Associates Inc.

Exports

For exports, similar tables have been prepared. Table 3-7 shows that for export flows via road the cheapest rates are also for Mwanza (US$ 1.43/km). This is the shortest segment and involves fewer delays because it has no border post. The most expensive segment is Bujumbura with a cost of US$ 2.78/km for light containers and US$ 4.44/km for heavy containers. In terms of average speed of the segments (without considering the time spent at the port) Mwanza is the fastest segment followed by Bujumbura, and Kigali. The reliability indicator show similar levels of reliability along all the segments of the corridor. In general, the shortest trips are the most unreliable given that the impact of the port unreliability is more significant. Variations in reliability of border crossing are also reflected in the results.

Table 3-7. Central Corridor Performance for Exports by Cargo Type and Origin (via road)

Origin	Distance (km.)	Price (US$ TEU)		Time (hours)	Reliability Indicator %	
		Light	Heavy		Light	Heavy
Mwanza	1,129	1,618	2,768	396	283	260
Goma	1,640	3,618	5,418	599	200	186
Kigali	1,281	3,314	4,918	454	248	228
Bujumbura	1,567	4,369	6,961	480	234	217
Port Node*						
Dar Es Salaam		319	319	325	344	316

Note: Port values are included in the total shown for each destination.

Source: Nathan Associates Inc.

For the exports flows transported via rail, Table XX shows that the transport rate per kilometer are similar; for Mwanza (US$ 1.45/km for all containerized cargo) is lower than Kampala (US$ 1.59/km) and Bujumbura (US$ 1.66/km). In terms of average speed (time of travel discounting the port time), the results are quite different with Mwanza being significantly faster (17.07 km/hr) compared with 8.2 km/hr and 7.7 km/hr for Kampala and

Bujumbura respectively. This is due to the speed of the lake portion of the segment that lowers the average of the segments from Kampala and Bujumbura.

Table 3-8. Central Corridor Performance for Exports by Cargo Type and Origin (via rail or rail / lake)

Origin	Distance (km.)	Price (US$ TEU)	Time (hours)	Reliability Indicator %
		Light / Heavy		Light / Heavy
Kampala (via rail/lake)	1,568	2,507	636	221
Mwanza (via rail)	1,229	1,794	517	271
Bujumbura (via rail/lake)	1,446	2,403	631	223
Port Node*				
Port Bell - Mwanza Port		132	48	150
Dar Es Salaam		319	397	351

Note: Port values are included in the total shown for each destination.

Source: Nathan Associates Inc.

When comparing imports to exports, it can be seen than moving containerized cargo has basically the same cost for import and export flows. This is explained by the tariff structure of the port of Dar es Salaam that charges the same prices for inbound and outbound containers. In terms of time containerized exports are subject to longer times at the port and the overall result for all segments indicates that exporting is slower than importing. The reason behind this is that containerized exports spend more time at the port than imports; the exporters are using the port as warehousing facility until the arrangement for the overseas transport of the cargo is made.

Cost and Time Comparison by Transport Alternative and Component

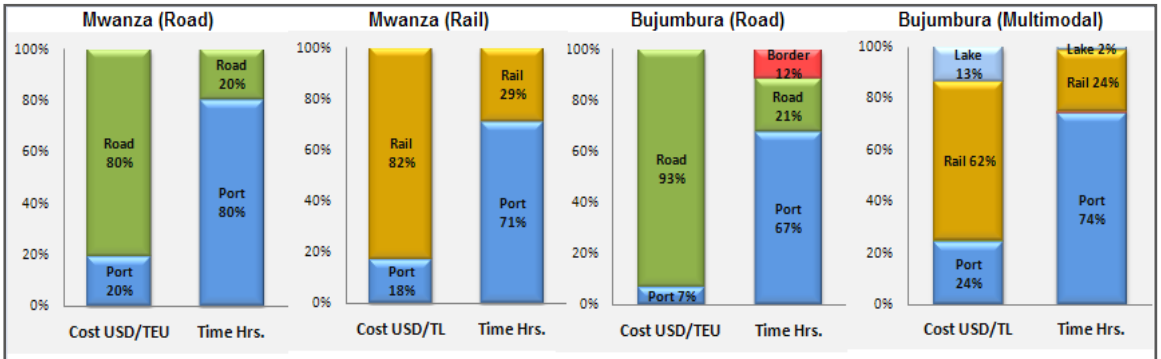
This section presents the results of the performance assessment for light containers which are generally indicative of the results for other cargo types. This section presents the results of the performance assessment for light containers which are generally indicative of results for other cargo types. The results are presented for imports/exports for the selected transport alternatives connecting each origin /destination and the port of Mombasa. The figures show the participation of each component (links and nodes) in the total costs and time of the transport alternative[2].

[2] The tables present the actual values of each component and include the estimated facilitation and extra inventory costs. The extra inventory cost is the estimated value of additional goods that corridor users have to move through the system, in order to maintain an uninterrupted supply / provision for their regular operations. All percentages in the figures are based on transport costs only.

IMPORTS

Two transport alternatives were considered for the segment between **Dar es Salaam** and **Mwanza**, one via road and one multimodal that combines rail and lake links. Figure 3-8 shows that the rail alternative is more expensive and slower than the road alternative. In terms of total costs (including facilitation and extra inventory) the rail connection exceeds by 10 percent the road and in terms of time rail exceeds the road mode by 13.5 percent. The difference in cost is explained by the higher price of rail surface transport and also in higher extra inventory cost.

Figure 3-8. Cost and Time for Central Corridor Destinations Served by Road and Rail/ Lake Transport Alternatives, 2010 (light containers)



Elements	Cost USD/TEU	Time Hrs.
Port	319	291
Road	1,300	71
Border	-	-
Rail	-	-
Lake	-	-
Transport	1,619	362
Facilitation	300	-
Extra Inventory	543	-
Total	2,462	362

Elements	Cost USD/TL	Time Hrs.
Port	319	291
Road	-	-
Border	-	-
Rail	1,475	120
Lake	-	-
Transport	1,794	411
Facilitation	300	-
Extra Inventory	617	-
Total	2,711	411

Elements	Cost USD/TEU	Time Hrs.
Port	319	291
Road	4,333	91
Border	-	50
Rail	-	-
Lake	-	-
Transport	4,652	432
Facilitation	300	-
Extra Inventory	648	-
Total	5,600	432

Elements	Cost USD/TL	Time Hrs.
Port	583	387
Road	12	0
Border	-	2
Rail	1,488	124
Lake	320	10
Transport	2,403	524
Facilitation	300	-
Extra Inventory	786	-
Total	3,489	524

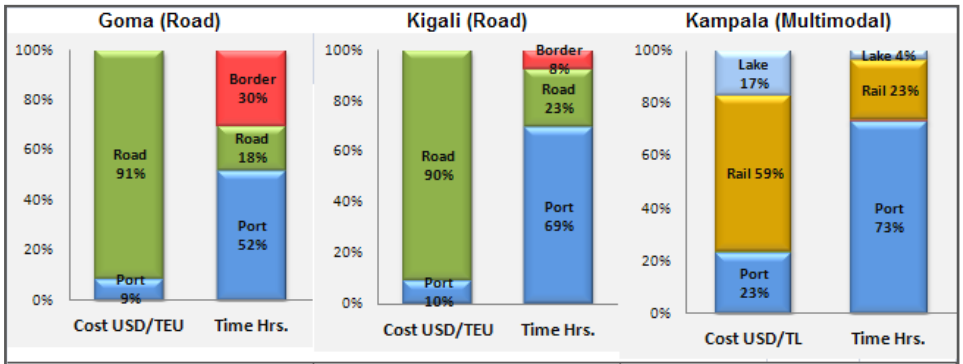
Source: Nathan Associates Inc.

The time that the cargo spends at the port is identical; therefore, total time difference is explained entirely by the longer time required to complete the movement of the cargo between the port and Mwanza via rail. The participation of port related costs and times in the total for both modes is similar; port costs account for 20 percent in the road option and 18 percent in the rail option; the remaining costs of both alternatives are related entirely to the surface transport cost. Time at the port for containers transported by road is 80 percent of the total time, while via rail is 71 percent.

Similarly to the previous segment, a road and a rail / lake alternatives were analyzed for the **Dar es Salaam** and **Bujumbura** segment. The rail / lake option is less expensive and slower than the road option, as would be expected. This alternative was the historic favorite for the shippers in Bujumbura and the one they are very interested in seeing improved. The cost of the multimodal option (including facilitation and extra inventory) is 38 percent less than the road; road surface transport costs almost triple rail surface transport costs. As for the port related costs these are higher for the rail / lake because cargo goes through three port nodes,

Dar es Salaam, port of Kigoma and the port at Bujumbura. The time for the rail / lake alternative is higher by 21 percent than for the road. This is caused by the poor port infrastructure and inefficiencies of the rail and the lake ports which hamper the intermodal transfer. Understandably, most of the costs for imports moved by road are related to surface transportation; in the multimodal option rail transport costs are the most relevant part with a 62 percent share of the total. In regards to time, the port is the most important component for both alternatives, accounting for 67 percent and 74 percent respectively (the last number includes the time at Kigoma and Bujumbura lake ports).

Figure 3-9. Cost and Time for Central Corridor Destinations Served by Single Transport Alternatives Road or Rail/ Lake, 2010 (light containers)



Elements	Cost USD/TEU	Time Hrs.
Port	319	291
Road	3,298	104
Border	-	170
Rail	-	-
Lake	-	-
Transport	3,617	565
Facilitation	300	-
Extra Inventory	847	-
Total	4,764	565

Elements	Cost USD/TEU	Time Hrs.
Port	319	291
Road	2,995	97
Border	-	32
Rail	-	-
Lake	-	-
Transport	3,314	420
Facilitation	300	-
Extra Inventory	630	-
Total	4,244	420

Elements	Cost USD/TL	Time Hrs.
Port	583	387
Road	7	0
Border	-	2
Rail	1,487	121
Lake	430	20
Transport	2,507	530
Facilitation	300	-
Extra Inventory	795	-
Total	3,602	530

Source: Nathan Associates Inc.

The road alternatives between **Dar es Salaam** and **Goma** and **Dar es Salaam** and **Kigali** present a similar distribution of times and costs. Road related costs are the prevailing component with 90 and 91 percent of the share of the total respectively. In terms of time, port is the most significant element for both destinations; additionally, in the case of Goma, containerized cargo spends around seven days clearing border post procedures, therefore there is a significant participation of border post related time, which accounts for 30 percent of the total time of the segment.

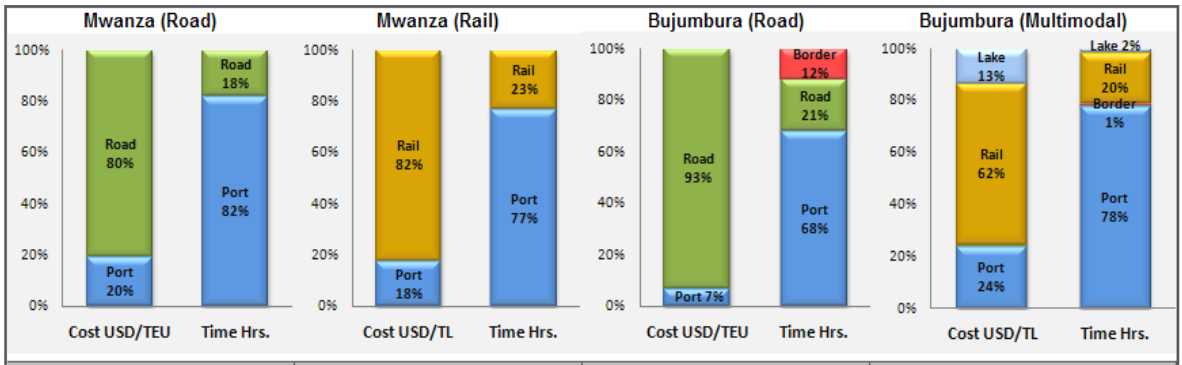
The multimodal alternative from **Dar es Salaam** to **Kampala** integrates rail and lake links; rail costs represent the main share of the overall cost (59 percent). Time at the port has the highest participation in the overall time accounting for 73 percent of the total. Port costs and time for this transport alternative include the values for Dar es Salaam, port of Mwanza and Port Bell. This option is currently not very competitive when compared to the transport alternatives along the Northern Corridor due to the lack of scheduled ferry services and inefficiencies in the operation of TRL. Anecdotal information suggests that at the peak of operation of the East

Africa Railway, the cost and time were very competitive which suggests that if the services are improved, this could be a viable transport alternative.

EXPORTS

The transport alternatives considered for exports correspond exactly to the ones presented for imports. Containerized exports flowing between **Mwanza** and **Dar es Salaam** are subject to higher cost and longer time if they use the rail option instead of the road alternative.

Figure 3-10. Cost and Time for Central Corridor Origins Served by Road, 2010 (light containers)



Elements	Cost USD/TEU	Time Hrs.	Elements	Cost USD/TL	Time Hrs.	Elements	Cost USD/TEU	Time Hrs.	Elements	Cost USD/TL	Time Hrs.
Port	319	325	Port	319	397	Port	319	325	Port	583	493
Road	1,300	71	Road	-	-	Road	4,050	99	Road	12	0
Border	-	-	Border	-	-	Border	-	56	Border	-	4
Rail	-	-	Rail	1,475	120	Rail	-	-	Rail	1,488	124
Lake	-	-	Lake	-	-	Lake	-	-	Lake	320	11
Transport	1,619	396	Transport	1,794	517	Transport	4,369	480	Transport	2,403	633
Facilitation	300	-	Facilitation	300	-	Facilitation	300	-	Facilitation	300	-
Extra Inventory	594	-	Extra Inventory	776	-	Extra Inventory	721	-	Extra Inventory	949	-
Total	2,513	396	Total	2,870	517	Total	5,390	480	Total	3,652	633

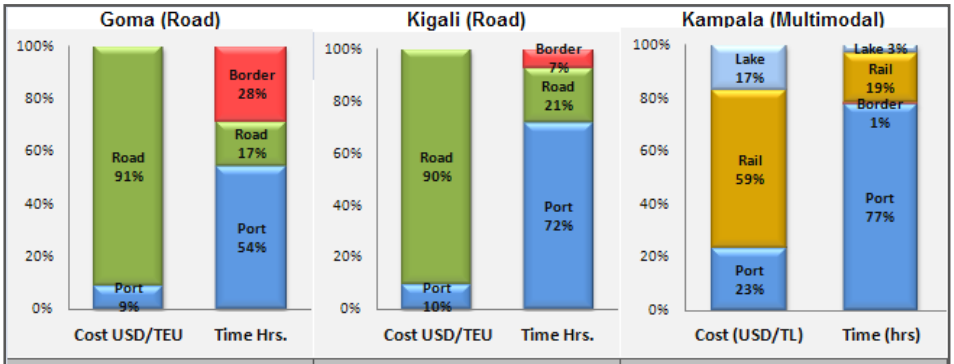
Source: Nathan Associates Inc.

The rail total cost exceeds the road cost by 14 percent, while the time difference is 30 percent. The difference in cost is due to higher rail surface transport costs and also higher extra inventory cost. The participation of port related costs and times in the total for both modes is similar; port costs account for 20 percent in the road option and 18 percent in the rail option; the remaining costs of both alternatives are related entirely to the surface transport cost. Time at the port for containers transported by road is 80 percent of the total time, while via rail is 71 percent.

The total cost of the connection between **Bujumbura** and **Dar es Salaam** via road is 47 percent higher than the rail cost. Even though the port and the extra inventory costs of the rail alternative exceed those corresponding to the road mode, the US$ 1,738 difference in higher road surface transport costs makes the road alternative more expensive. The participation of port costs in the rail/lake alternative is 24 percent versus only 7 percent in the road alternative. Also the participation of port time is higher in the rail/lake scenario by 10 percent. This higher participation is again explained because the port value for the lake/rail

alternative aggregates costs and times for the three port nodes of the segment, Dar es Salaam, port of Kigoma and the port at Bujumbura.

Figure 3-11. Cost and Time for Central Corridor Origins served by a Single Transport Alternative, 2010 (light containers)



Elements	Cost USD/TEU	Time Hrs.
Port	319	325
Road	3,298	104
Border	-	170
Rail	-	-
Lake	-	-
Transport	3,617	599
Facilitation	300	-
Extra Inventory	898	-
Total	4,815	599

Elements	Cost USD/TEU	Time Hrs.
Port	319	325
Road	2,995	97
Border	-	32
Rail	-	-
Lake	-	-
Transport	3,314	454
Facilitation	300	-
Extra Inventory	681	-
Total	4,295	454

Elements	Cost USD/TL	Time Hrs.
Port	583	493
Road	7	0
Border	-	4
Rail	1,487	120
Lake	430	20
Transport	2,507	638
Facilitation	300	-
Extra Inventory	956	-
Total	3,763	638

Source: Nathan Associates Inc.

The road alternatives for exports between **Dar es Salaam** and **Goma** and **Dar es Salaam** and **Kigali** present a similar distribution of costs between port and road surface cost. Road related costs are the prevailing component with 90 and 91 percent of the share of the total respectively. In terms of time, port is the most significant element for both destinations; additionally, in the case of Goma, containerized cargo spends around seven days clearing border post procedures, therefore there is a significant participation of border post related time, which accounts for 28 percent of the total time of the segment.

For the multimodal alternative from **Dar es Salaam** to **Kampala** the rail costs represent the main share of the overall cost (59 percent). Time at the port has the highest participation in the overall time accounting for 73 percent of the total. Port costs and time for this transport alternative include the values for Dar es Salaam, port of Mwanza and Port bell.

Interpretation of Results

DAR ES SALAAM PORT PERFORMANCE

The analysis of all the different alternatives between the selected destinations / origins for exports and imports along the Central Corridor show consistently that the greatest share of the time is spent at the port of Dar es Salaam.

Table 3-9 summarizes the assessment of the specific components of the port node. The results show that containerized cargo spends most of the time in the yard, which understandably, presents also the lower logistics score of the node components. The next component with a mayor share in time is the berth and accordingly its logistics score is the second lower. Gate operations occur generally in an efficient and fluid manner, being this element the best ranked according to the port nodes logistics scores.

Table 3-9. Dar es Salaam Port Performance (light containers)

Component	Imports			Exports		
	Price (USD)	Time (hrs)	Reliability Indicator (%)	Price (US$)	Time (hrs)	Reliability Indicator (%)
Dar es Salaam Port	319	291	245	319	325	344
Channel	0	48	100	0	0	0
Berth	90	48	100	90	48	100
Yard	150	120	112	150	252	243
Customs	79	72	133	79	24	100
Gate	0	3	112	0	1	200

Source: Nathan Associates Inc.

Shipping lines have indicated that the productivity in handling smaller ships at Dar es Salaam, with about 500 moves (in/out), was 10 moves/crane–hour. Since smaller ships were usually assigned only one crane, this also was the berth productivity. Accordingly, the berth time for handling these ships was about two days. For larger ships, handling 800–1,200 moves/call, productivity did reach higher levels of about 13 moves/crane–hour. Since these ships work part of the time with two cranes, the overall berth productivity was 15 moves/berth–hour. At this handling rate, these ships spent three to four days at berth. Participants in our Dar es Salaam workshop in October 2010 observed that recently TICTS has been reaching 20 moves/berth-hour, presumably following the commissioning of the new STS gantry cranes.

The reason for the low productivity, according to the shipping lines, was first and foremost yard congestion. The shore cranes spent much of their time waiting for yard tractors, while these tractors, in turn, were waiting for RTGs. The congestion and waiting of shore cranes is attributed to the simultaneous handling of RTGs yard tractors and outside trucks of shippers and consignees. These trucks compete with yard tractors on RTG services and also queue inside the stacks. Moreover, handling import boxes to outside trucks often requires shuffling of boxes, which sometimes may require additional five moves (TICTS operates with one over

five RTGs). Another reason for the low productivity is frequent breakdowns of handling equipment, especially the 25 year old gantry cranes. Shipping lines also complained that there was a shortage in all types of handling equipment: shore cranes, RTGs, RSs and yard tractors. For example, the lines claimed that ships with 500 moves should be assigned two shore cranes and those with 1,000 moves even three cranes (depending on stowage plan).

The productivity data provided by the terminal operators was somewhat higher than that claimed by lines. TICTS claimed that crane productivity has recently increased reaching 12 moves/crane-hour. TICTS agreed that the main reason for the low productivity is congestion; in the pre–congestion period, they claim that productivity was +20 moves/crane–hour.

TPA claimed that their MHCs' productivity was 12–14 moves/crane–hour. Accordingly, while typically working with two MHCs, berth productivity was at times 24–28 moves/berth–hour. This productivity was similar or perhaps even exceeding that of TICTS, which explains why lines preferred directing their ships to the conventional container terminal when the container terminal was occupied.

Ships' waiting time, according to shipping lines, ranged two to four days, which was a great improvement compared to up to 12 days previously. As seen above, berth time at TICTS for small ships was two days and for large ships three to four days. Hence, the total port time ranged from five to seven days.

No data on truck turnaround times was available. The lines indicated that it was probably six to eight hours. The long time was required due to the pre–gate, out–gate and RTG waiting along with waiting for the scanning process. Even longer waiting times were required in case of Customs verification (physical inspection). It should be noted that all containers, including those transferring to the ICDs, are required to be scanned at the port.

OTHER CAUSES OF INEFFICIENCY

Other cause of corridor inefficiencies that are common to the Northern and Central Corridors is described at the end of Chapter 2.

4. Comparative Corridor Performance and Future Requirements

In this chapter, we present a comparative assessment of the performance of the Northern and Central Corridors. First, we compare the two corridors performance to common destinations or origins served for imports and exports, respectively. This is followed by a comparison of the overall performance of the Northern and Central Corridors to other African and Asian corridors. The chapter concludes with the presentation of the trade and traffic forecast for the Northern and Central Corridors.

Comparative Analysis

In this section we present a performance comparison for the transport alternatives on the Northern and Central Corridors serving common origins or destinations by cargo type. In the tables that are presented, the best result for each destination in terms of price, time and reliability is highlighted with a box.

IMPORTS

As shown in Table 4-1, the performance comparison for **Kigali** shows that the road alternative on the Central Corridor offers the lowest price (US$ 587 less) while not the fastest time which is offered by the road alternative on the Northern Corridor (44 hours faster). This relationship is held over the other cargo types analyzed. Additionally, it's worth to note that this matches the perception that while the distance from Kigali and Bujumbura are shorter to the port of Dar es Salaam (hence the lowest prices to ship through Dar), the faster service is offered by the alternatives through the port of Mombasa (given its faster processing time). The road transport alternatives to **Goma** show similar results with the lowest price on the Central Corridor and the fastest alternative on the Northern Corridor.

Table 4-1. Performance Comparison of Destinations Served by Both the Northern and Central Corridors, 2010 (imports)

Destination and Corridor	Mode	Distance km.	Light Containers			Dry Bulk			Liquid Bulk		
			Price (US$)	Time (hours)	Reliability Indicator (%)	Price (US$)	Time (hours)	Reliability Indicator (%)	Price (US$)	Time (hours)	Reliability Indicator (%)
Kampala											
Northern	Road	1,180	2,099	323	194	3,511	276	262	3,316	240	217
Northern	Rail	1,200	2,059	281	138	3,432	415	177	3,237	379	141
Central	Rail+Lake	1,568	2,507	530	150	2,250	539	152	2,250	539	152
Kigali											
Northern	Road	1,661	3,901	376	167	6,658	329	220	6,463	293	178
Central	Road	1,495	3,314	420	171	4,661	525	166	4,661	429	155
Bujumbura											
Northern	Road	1,903	4,950	411	153	8,511	364	200	8,316	328	160
Central	Road	1,567	4,369	440	163	6,704	545	159	6,704	449	147
Central	Rail+Lake	1,446	2,403	524	152	2,146	533	154	2,146	533	154
Goma											
Northern	Road	1,811	4,822	537	131	8,200	490	162	8,005	454	135
Central	Road	1,640	3,618	565	135	5,161	670	144	5,161	574	136
Port Node*											
Mombasa Transit			297	217	287	360	170	424	165	134	386
Dar Transit			319	291	245	62	396	217	62	300	217

Note: Port values are included in the totals shown for each destination.
Source: Nathan Associates Inc.

For **Bujumbura** different transport alternatives have the lowest price (rail+lake alternative on the Central Corridor) and the fastest time (road alternative on the Northern Corridor) for transporting light containers. The rates for rail and lake transport are generally the lowest and coupled with a shorter distance combine to make this alternative the one with the lowest time. On the other hand, rail and lake are also the slowest and most unreliable with together with the fact that Dar es Salaam is slower than Mombasa by 74 hours explain why the fastest alternative is by road on the Northern Corridor. The performance comparison of transport alternatives for other cargo types shows similar results.

There are three transport alternatives into **Kampala**, one for road and one for rail on the Northern Corridor and one on lake+rail on the Central Corridor. The performance comparison for Kampala shows that for light containers the rail alternative from the port of Mombasa is best in the three categories considered (lowest price, fastest and most reliable). This is the only case where other cargo types behave differently from light containers. For dry bulk and liquid bulk, the lowest price is observed in the lake plus rail Central Corridor alternative while the fastest alternative is by road on the Northern Corridor. These results are consistent with the results on other destinations.

EXPORTS

Table 4-2 presents a performance comparison for the transport alternatives on the Northern and Central Corridors serving common export origins by cargo type. For **Kigali** and **Goma**, there are two road transport alternatives. As with imports, the road alternative on the Central Corridor has the lowest price while the fastest is the one on the Northern Corridor. This is true for light and heavy containers.

For exports from **Bujumbura** there are three transport alternatives. The lowest price is observed in the shortest alternative that additionally uses the least expensive modes (rail+lake). The fastest alternative is by road on the Northern Corridor.

Finally for **Kampala**, the lowest price for light containers is by rail on the Northern Corridor and the fastest in on the same corridor but by road. The results for heavy containers indicate that the lowest price is on the Central Corridor by rail+lake even though this alternative is the longest. The information provided by TRL indicates no differentiated transport rates for light and heavy containers. On the other hand, RVR indicates that the common business practice is to charge higher tariffs for heavy containers. Since that differentiation was not reported by TRL, the tariffs for the central corridor are the same for light and heavy containers and less expensive that on the Northern Corridor for heavy containers.

Table 4-2. Performance Comparison of Origins Served by Both the Northern and Central Corridors, 2010 (exports)

Origin and Corridor	Mode	Distance km.	Light Containers			Heavy Containers		
			Price (US$)	Time (hours)	Reliability Indicator (%)	Price (US$)	Time (hours)	Reliability Indicator (%)
Kampala								
Northern	Road	1,180	2,062	395	267	3,441	395	353
Northern	Rail	1,200	2,022	558	191	3,362	558	260
Central	Rail+Lake	1,568	2,507	636	221	2,507	636	221
Kigali								
Northern	Road	1,661	3,864	422	250	6,588	422	261
Central	Road	1,281	3,314	454	248	4,918	454	228
Bujumbura								
Northern	Road	1,903	4,913	433	244	8,441	433	255
Central	Road	1,567	4,369	480	234	6,961	480	217
Central	Rail+Lake	1,446	2,403	631	223	2,403	631	223
Goma								
Northern	Road	1,811	4,785	429	246	8,113	429	257
Central	Road	1,640	3,618	599	200	5,418	599	186
Port Node*								
Mombasa - Transit			260	313	336	290	313	351
Dar - Transit			319	325	344	319	325	316

Note: Port values are included in the totals shown for each origin.

Source: Nathan Associates Inc.

COMPARISONS OF NORTHERN AND CENTRAL CORRIDOR PERFORMANCE TO OTHER AFRICAN AND ASIAN CORRIDORS

In order to assess the overall performance of the Northern and Central Corridors it is useful to compare their performance with that of other corridors in Africa and elsewhere. The FastPath methodology used for CDS has been applied to several other African and Asian corridors and provides an appropriate basis for comparison.

In addition to the above indicators for price, time and reliability, FastPath calculates "logistics scores" for each transport/logistics chain, segment and component. The *logistics score* is computed by comparing the performance of a component of the transport/logistics chain and rating it as good, fair, poor or very poor, according to international standards. This rating is then converted to a numeric score (61-80 if good, 41-60 if fair, 21-40 if poor and 1-20 if very poor). Then the scores for price, time and reliability are averaged to get the total score for a component. The scores for nodes and links are then given a time-weighted average to compute the segment total. If there is more than one segment corridor in a corridor, their scores are combined to compute their volume-weighted average for the total chain.

A *logistics score* between 70 and 80 indicate that time, cost and reliability in the total supply chain is efficient and competitive according to global standards. These scores are computed only for containerized cargo.

Table 4-3 presents a comparison of FastPath logistics scores by corridor and segment. The overall score is shown as well as the component scores for port, road rail and border posts. For the Northern Corridor, imports to Nairobi, Kampala and Kigali by road currently are all rated as "Good" albeit at the bottom of the Good scale. Other Northern Corridor destinations are currently rated in the upper range of the "Fair" category. Mombasa Port is considered as "Fair". Road segments to Nairobi, Kampala and Kigali as scored as "Good" while other destinations have a "Fair" rating. The rail component is also rated as "Fair". All of the border posts in Northern Corridor are rated as "Good" with the exception of Nimule which is rate "Fair".

For the Central Corridor the overall score to all destinations is "Good" except for Bujumbura which is rate "Poor" due to the performance of the road. The Port of dare s Salaam is rated as "Fair"and is scored a few points below the Port of Mombasa. All of the border posts in the Central Corridor are rated as "Good".

The overall performance of the two corridors is considered fair and is comparable to the performance of the other African and Asian corridors shown in Table 4-3. However, the Fast Path methodology has been applied in developing countries; the goal should be to reach a Good rating for all components.

Table 4-3. Comparison of Fastpath Logistics Scores by Corridor and Segment

Corridor and Segment	Logistics Score				
	Overall	Port	Road	Rail[1]	Border Post[2]
Northern Corridor (from Mombasa port)					
Nairobi (via road)	61	57	73	--	--
Nairobi (via rail)	50	57	--	47	--
Kampala (via road)	64	57	64	--	67
Kampala (via rail)	53	57	--	49	77
Bujumbura (via road)	57	54	54	--	71
Kigali (via road)	61	54	60	--	68
Nimule(via road)	54	54	52	--	57
Kasindi (via road)	56	54	55	--	62
Goma (via road)	52	54	48	--	67
Central Corridor (from Dar es Salaam)					
Mwanza (via road)	50	52	50	--	--
Mwanza (via rail)	51	55	--	50	--
Bujumbura (via road)	36	52	30	--	70
Bujumbura (via rail)	54	55	60	48	80
Kampala (via rail)	56	55	60	51	80
Kigali (via road)	59	52	58	--	72
Goma (via road)	45	52	41	--	70
Other Road Corridors in Africa					
Tema - Ouagadougou (2008)	51	55	55	--	46
Durban - Nelspruit (2007)	63	60	65	--	73
Maputo - Nelspruit (2007)	62	51	51	--	--
Road Corridors in Asia					
Laem Chabang -Vientiane (2006)	64	49	70	--	65
Dacca Chittagong (2006)	59	60	58	--	--

Note 1: Rail score aggregates the results for segments combining rail and lake links.

Note 2: Border post score is the average score of all border posts in the segment.

Source: Nathan Associates Inc.

Good	61-80
Fair	41-60
Poor	21-40
Very Poor	1-20

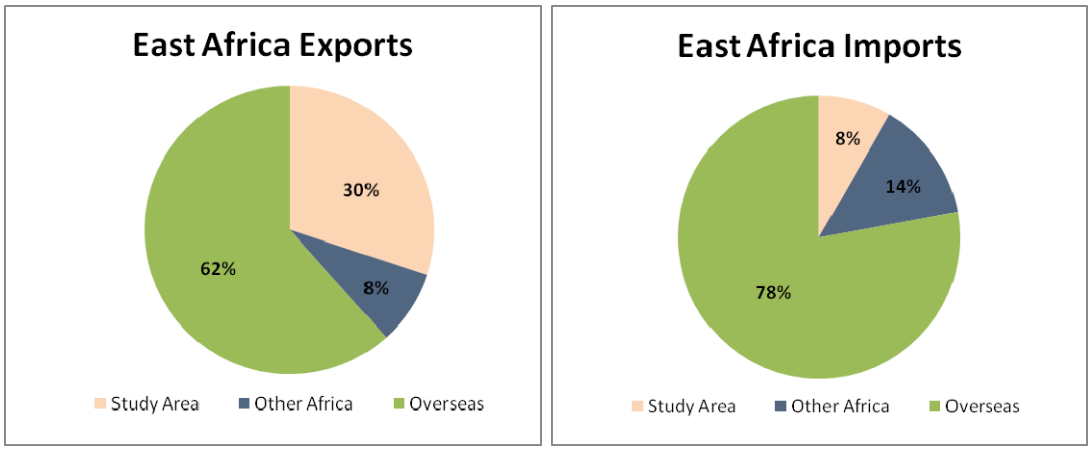
Trade and Traffic Forecasts

In this section we discuss trends historic in East African trade flows and present the current traffic volumes handled on the Northern and Central Corridor by mode and type. This is followed by the outlook for GDP growth in the region through 2030 and the forecast of regional trade. We conclude with a presentation of the forecast of Northern and Central Corridor traffic by mode and type for 2015 and 2030.

TRENDS IN EAST AFRICAN TRADE FLOWS

As in other parts of Africa, East African trade is very overseas-oriented. Total East African trade was 34,5 million tons in 2008, consisting of 27 million of imports (78.4 percent) and 7.5 million of exports (21.6 percent). Most of its exports and imports are with overseas partners (62 and 78 percent respectively), while the rest stay within East Africa region (30 and 8 percent) and with other African countries (8 and 14 percent). This is shown graphically in Figure 4-1.[1]

Figure 4-1. Distribution of East Africa Exports and Imports, 2008



SOURCE: IMF Direction of Trade Statistics, and COMTRADE.

From 2005 through 2009, there was rapid growth in transit traffic for countries using the Northern and Central Corridors as shown in Table 4-4. Total transit imports increased from 3.4 million tons in 2005 to 5.6 million tons in 2009, corresponding to an average annual growth rate of 13.3 percent. In 2009, Uganda accounted for two-thirds of transit imports and half of transit exports. Burundi transit imports increased from a conflict-related depressed base of 103 thousand tons in 2005 to 335 thousand tons in 2009, an average annual increase of 34.3 percent.

[1] The "Study Area" is defined as the following eight countries: Burundi, Congo DR (Eastern), Ethiopia, Kenya, Rwanda, Sudan (Southern), Tanzania, Uganda , while "Other Africa"is defined as the the countries in the African continent other than East Africa region.

Table 4-4. Transit Traffic of Landlocked Countries, 2005-2009 (000 tons)

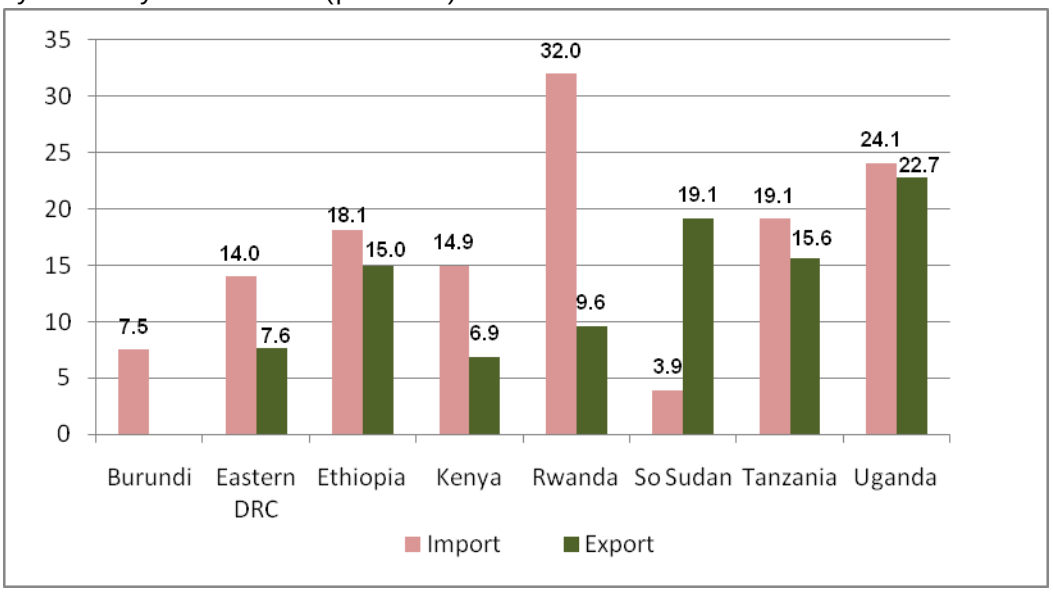
Country	2005	2006	2007	2008	2009	AAGR 2005-2009 (%)
IMPORTS						
Burundi	103	177	212	270	335	34.3
Eastern DR Congo	467	592	653	736	834	15.6
Ethiopia	11	12	13	15	17	11.5
Rwanda	244	320	371	487	550	22.5
Sudan	141	130	145	220	156	2.6
Uganda	2,449	2,578	3,151	3,471	3,730	11.1
Total	3,416	3,809	4,546	5,199	5,622	13.3
EXPORTS						
Burundi	56	57	65	72	59	1.3
Eastern DR Congo	63	77	98	122	145	23.2
Ethiopia	30	35	40	45	50	13.6
Rwanda	34	40	31	39	41	4.8
Sudan	1	1	1	1	1	0.0
Uganda	293	282	318	334	299	0.5
Total	478	491	553	612	595	5.6

Source: Nathan Associates Inc.

The average annual growth in trade from 2005-2009 is presented in Figure 4-2. Import growth exceeded export growth in all countries but Sudan. The highest growth in imports was Rwanda (32 percent), followed by Uganda (24.1 percent) and Tanzania (19.1 percent). Uganda (22.7 percent), Sudan (15.6 percent) and Ethiopia (15 percent) had the highest growth in exports. The difference in import vs. export growth was more significant in Rwanda, Burundi and Kenya, where import and export growth were closer in speed in Uganda and Tanzania.

During this period, Kenya's imports increased at an average annual rate of 15 percent whereas exports grew by only 7 percent. Tanzania imports and exports increased at an annual rate of 19.1 percent and 15.6 percent, respectively.

Figure 4-2. Average Annual Growth of Imports and Exports by Country 2005-2009 (percent)



Source: Nathan Associates Inc.

Some further observations on common characteristics and trends regarding East African trade flows include:

- Countries with a recent history of conflict and economic crises had very low or negative trade growth in the last decade. The most prominent examples are DR Congo with high negative trade growth rates and Burundi with low import growth rates. Countries that had conflict earlier had high growth rates reflecting recovery, such as Rwanda.
- Export growth rates tend to be faster for overseas trade than those for imports.
- Overseas trade is higher in unit value than trade within Africa. We see a generally increasing trend in overseas trade.
- Europe used to be a major trading partner but its share in total trade seems to be gradually decreasing for most East African countries.
- East Asia is an emerging trading partner for East Africa and its imports from East Africa are projected to increase continuously.
- In the recent past, there are certain countries with high short term growth rates (e.g., 34 percent import growth to overseas regions for DR Congo). However, the growth rates for these countries are expected to stabilize at lower levels in the long run.

CURRENT NORTHERN AND CENTRAL CORRIDOR TRAFFIC

As presented in Table 4-5, total traffic on the Northern and Central Corridors in 2009 is estimated at 28.6 million tons, of which 21.5 million tons were shipped via the Northern Corridor (75 percent) and 7.1 million tons on the Central Corridor (25 percent). More than 83 percent of the traffic on the Central Corridor was

domestic, that is, Tanzanian trade to overseas countries. Regional trade and transit traffic accounted for 10 percent and 7 percent, respectively of the remaining Central Corridor traffic. On the Northern Corridor, Kenyan overseas trade accounted for 58 percent of the total corridor traffic with transit traffic next at 28 percent and regional trade at 14 percent.

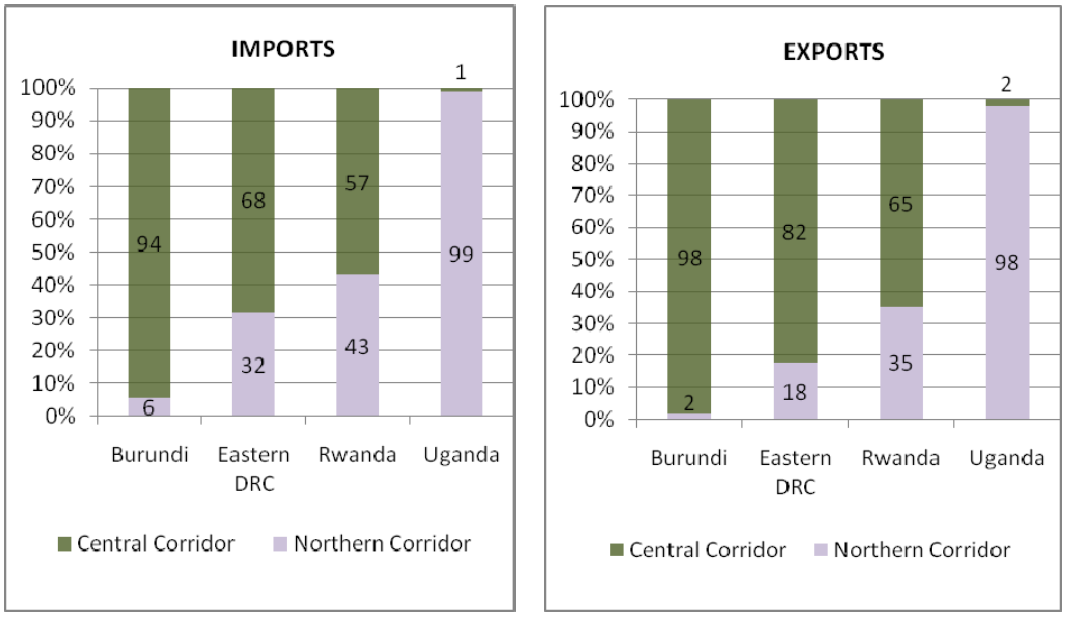
Table 4-5. Northern and Central Corridor Traffic by Type and Mode 2009 (000 tons)

Corridor and Type of Traffic	Road	Rail	Total	Rail Share (%)
Northern				
Transit	5,509	417	5,926	7%
Regional	2,974	151	3,125	5%
Domestic	11,817	622	12,439	5%
Total	20,300	1,190	21,490	6%
Central				
Transit	357	111	468	24%
Regional	658	32	690	5%
Domestic	5,617	296	5,913	5%
Total	6,632	439	7,071	6%
Total	**26,932**	**1,629**	**28,561**	**6%**

Source: Nathan Associates Inc.

Historically, the landlocked countries of Burundi, (Eastern) DR Congo, Rwanda and Uganda divide their overseas imports and exports between the Northern and Central Corridors, while Southern Sudan and Ethiopia only use the Northern Corridor. The shares of transport volumes using each port from these countries for import and exports are shown in Figure 4-3 for the period 2005-2009.

Figure 4-3. Share of Transit Traffic by Corridor, 2009 (percent)



Source: Nathan Associates Inc.

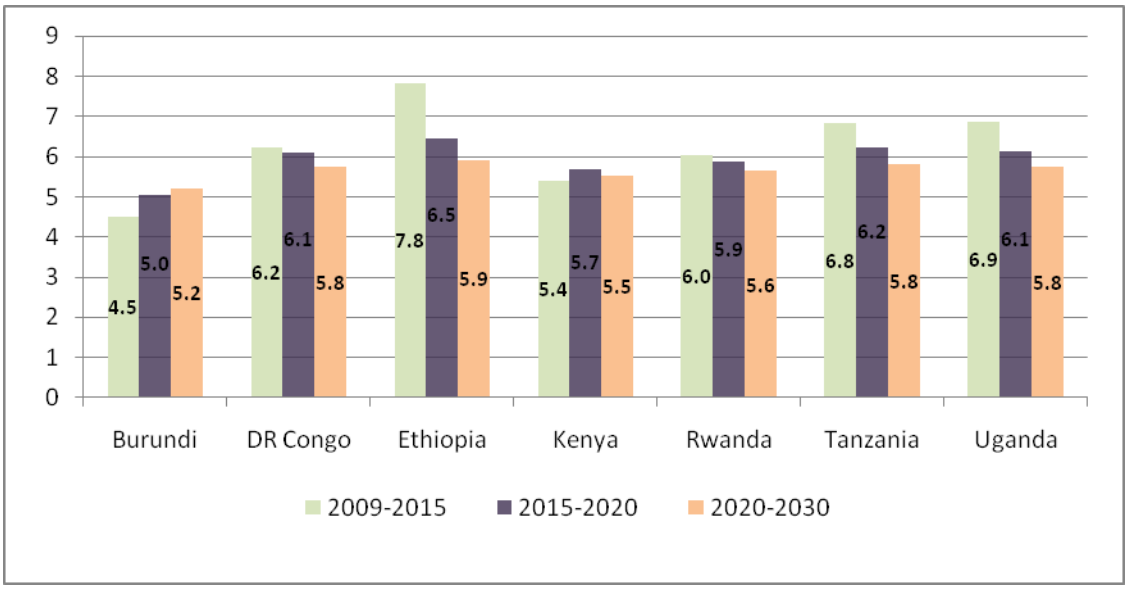
REGIONAL GDP GROWTH

Trade forecasts were prepared using a regression analysis based on GDP and population projections[2]. The weighted average regional growth rate for the seven East African countries for the 2009-2015 period is 6.2 percent. The CDS trade growth rates represented by the preceding tables are summarized in Figure 4-4. The growth rates for trade from 2008 to 2009 show that despite the economic turndown, the region as a whole experienced substantial trade growth. This growth is forecast into the future with rapid recovery of exports in the short term and moderating growth in the longer term.

Except for Burundi, higher growth is forecast in the 2009-2015 for all other countries shown and a tapering from 2015-20 and 2020-30. For 2009-2015, growth is between 6-7 percent annually except for Ethiopia at 7.5 percent and Burundi at 4.7 percent. From 2015-20 and 2020-30, the average annual growth rate is between 5 and 6 percent generally.

[2] A complete description of the forecasting methodology is presented in CDS Draft Action Plan, Volume 2, Technical Paper B. on Trade and Traffic Forecasts.

Figure 4-4. Average Annual GDP Growth Used in the CDS Forecast, 2009-2030 (percent)



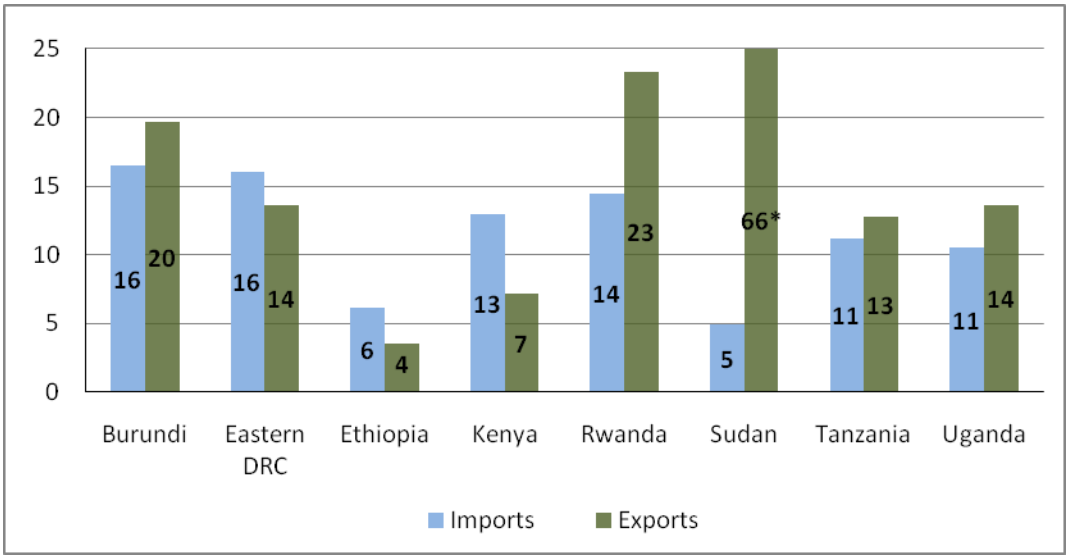
Source: Nathan Associates Inc.

FORECAST OF EAST AFRICAN TRADE

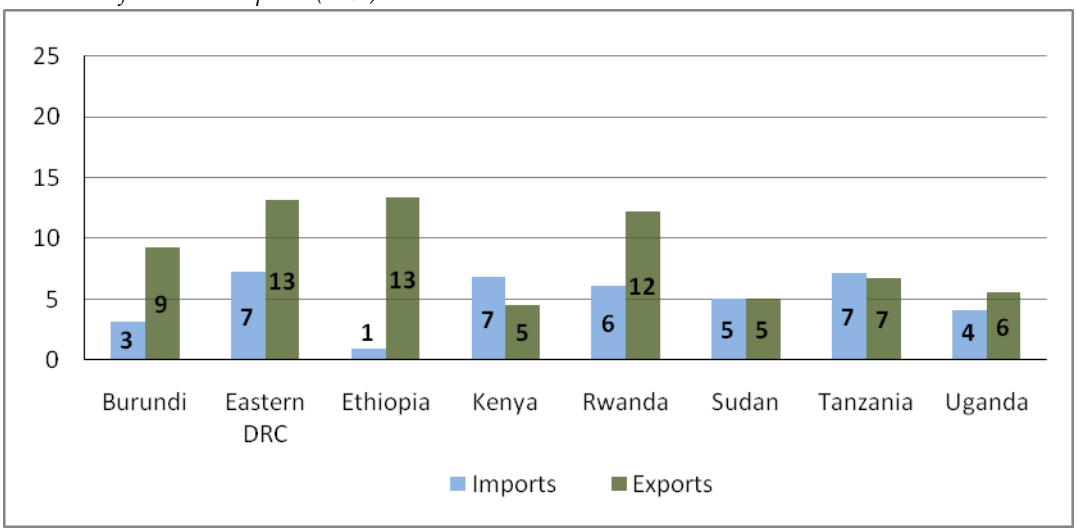
Trade projections were prepared for the flows between eight countries of East Africa region, as well as flows between East Africa countries and overseas regions for the years 2015 and 2030. Trade projections were made using a regression analysis, based on GDP and population projections. Figure 4-5 presents the average annual growth in imports and exports by country for the periods 2009-2015 and 2015-2030. Expected trade growth in the period 2009-2015 exceeds that of 2015-2030; in some cases more than by double: in Burundi, Rwanda and Uganda for exports and imports; and in Eastern DRC and Ethiopia for imports. The highest growth expected in imports is in Eastern DRC (16 percent), Rwanda (13 percent) and Kenya (13 percent) for 2009-15; and Eastern DRC, Kenya and Tanzania in the period 2015-2030, with an expected growth rate around 7 percent. For exports, Rwanda and Burundi are expected to have the highest growth in 2009-2015[3]. After 2015, export growth is expected to overtake import growth in most countries, Eastern DRC (13 percent), Ethiopia (13 percent), Rwanda (12 percent) and Burundi (9 percent).

[3] The reason Sudan is not mentioned here although the graph shows 66% export growth, is due to the fact that this growth is from a small base and therefore

Figure 4-5. Average Annual Trade Growth by Country, 2009-2015 and 2015-2030 (percent)



**The value for Sudan Exports (66%) is not to scale*



Source: Nathan Associates Inc.

FORECAST OF NORTHERN AND CENTRAL CORRIDOR TRAFFIC

Tables 4-6 and 4-7 present the forecast of Northern and Central Corridor traffic for 2015 and 2030, respectively. Total traffic on the two corridors is forecast to increase from 28.6 million tons in 2009 to 52.5 million tons in 2015 and to reach 143.1 million tons by 2030. Those volumes correspond to an average annual growth rate of 11 percent between 2009-2105 and 7 percent between 2015 and 2030. In both corridors, for most of the years considered, domestic traffic makes up more than half of corridor traffic.

Traffic on the Northern Corridor is forecast to increase at an annual rate of 9 percent form 2009-2015, increasing from 21.5 million tons to 35.3 million tons. Growth by type of traffic is relatively balanced with transit, regional and domestic traffic each growing at an annual rate of 8-9 percent. Even though the annual rate of growth decreases to 6 percent from 2015 to 2030, traffic on Northern Corridor is forecast to increase from 35.3 million tons in 2015 to 54.0 million tons by 2030.

Table 4-6. Forecast of Northern and Central Corridor Traffic by Type and Mode 2015 (000 tons)

Corridor and Type of Traffic	Road	Rail	Total	Average Growth/yr 2009-2015	Rail Share (%)
Northern					
Transit	6,883	3,142	10,025	9%	31%
Regional	4,764	202	4,966	8%	4%
Domestic	19,259	1,014	20,273	8%	5%
Total	30,906	4,358	35,264	9%	12%
Central					
Transit	1,584	1,440	3,024	36%	48%
Regional	1,417	58	1,475	13%	4%
Domestic	12,138	639	12,777	14%	5%
Total	15,139	2,137	17,276	16%	12%
Total	**46,046**	**6,495**	**52,540**	**11%**	**12%**

Source: Nathan Associates Inc.

Table 4-7. Forecast of Northern and Central Corridor Traffic by Type and Mode 2030 (000 tons)

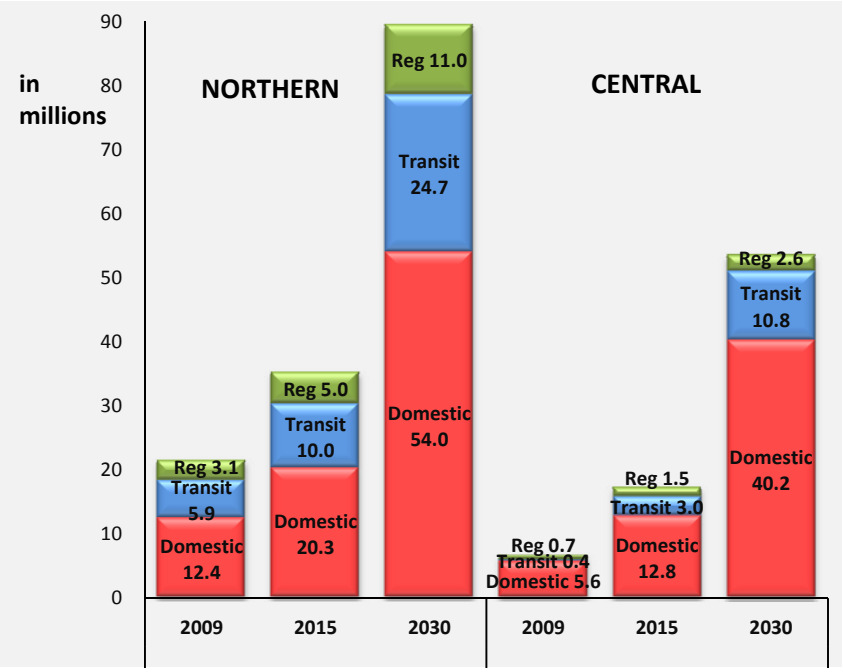
Corridor and Type of Traffic	Road	Rail	Total	Average Growth/yr 2015-2030	Rail Share (%)
Northern					
Transit	16,524	8,145	24,669	6%	33%
Regional	10,517	442	10,959	5%	4%
Domestic	51,253	2,698	53,950	7%	5%
Total	78,294	11,285	89,578	6%	13%
Central					
Transit	6,341	4,450	10,791	9%	41%
Regional	2,479	91	2,570	4%	4%
Domestic	38,320	1,888	40,209	8%	5%
Total	47,140	6,429	53,570	8%	12%
Total	**125,434**	**17,714**	**143,148**	**7%**	**12%**

Source: Nathan Associates Inc.

Central Corridor traffic is forecast to have a higher rate of growth than the Northern Corridor for both the 2009-2015 and 2015-2030 periods. From 2009-2015 traffic on the Central Corridor is forecast to increase at an annual rate of 16 percent, from 7.1 million tons in 2009 to 17.3 million tons in 2015. From 2015-2030, growth is forecast at 8 percent annually and to increase from 17.3 million tons in 2015 to 53.6 million tons in 2030. Traffic volume that goes through the Northern Corridor in 2030 is expected to be 67 percent higher than that of Central Corridor.

Regarding type of traffic, transit traffic is forecast to jump substantially from 468 thousand tons in 2009 to 3.0 million tons in 2015, an average annual increase of 36 percent. This however, reflects growth from a depressed level of traffic in 2009 due to operational problems with the TRL rail system and the effects of a track washout. In both corridors, domestic traffic usually makes up more than half of corridor traffic. In 2009, domestic traffic made up 58 percent of Northern Corridor traffic, whereas in Central corridor this share was 85 percent. The share of domestic traffic in Northern Corridor is expected to slightly increase to around 60 percent by 2030, while it is expected to fall by 10 percentage points in Central Corridor. The composition of each corridor's traffic by type is presented graphically in Figure 4-6.

Figure 4-6. Forecast of Northern and Central Corridor Traffic by Type, 2009-2030 (mt)



ource: Nathan Associates Inc.

During the forecast period, there is an overall increase in share of rail as a mode in the total corridor traffic from 6 percent in 2009 to 12 percent for 2015 and 2030. For transit traffic of Northern Corridor, the share of rail is expected to increase from 7 percent in 2009 to 33 percent in 2030.

IMPLICATIONS FOR CORRIDOR INFRASTRUCTURE

The amount of traffic forecast for the Northern and Central Corridors will overwhelm the existing infrastructure and will obvious require substantial investments throughout the forecast period. Some of the implications of the traffic forecast are highlighted below.

- Unconstrained traffic growth implies large future demand on ports, highways and rail.
- Port capacity will need to increase by 24 million tons by 2015 and 117 million tons by 2030
- Road network needs to be able to handle **80 percent** more traffic by 2015 and **4 times** more traffic by 2030
- If capacity is not increased, **congestion** at ports and on roads will reach epic levels and constrain economic growth

There is a clear need for substantial and targeted investment in regional transport infrastructure now and continuing for the next several decades.

5. Strategies for Improving Corridor Performance

Improving the efficiency and reliability of the Northern and Central Corridors will require the adoption and implementation of an integrated Action Plan to simultaneously address infrastructure constraints and bottlenecks and operational inefficiencies, policies and procedures. In this section, we present proposed strategies that can improve corridor performance immediately or within the next three two years. While the strategies should be considered as a whole as part of the integrated Action Plan, for presentation purposes they are discussed below under individual components of the corridor's logistic chain.

Maritime Ports

As the gateways for the two corridors, the ports of Mombasa and Dar es Salaam must have adequate capacity and be able to perform efficiently in order for the overall corridor performance to improve. If measures are not undertaken to address the constraints, bottlenecks and inefficiencies at the ports, the corridor performance will continue to suffer even if all other components of the logistics chain are improved. In the sections below, we propose strategies for increasing the capacity and efficiency of the two ports in the next five years to handle the volume of containers, dry bulk and liquid bulk cargo that is forecast.

CONTAINER OPERATIONS

The diagnostic assessment of the ports of Dar es Salaam and Mombasa has identified capacity constraints and low productivity as the key challenges for improving container operations. An optimized port / ICD integration program is proposed as a short-term solution to alleviate such capacity constraints; by transferring cargo handling at the marine terminals container yards to near port Inland Container Depots (ICDs). Both ports have master plans defining long-term development projects, including new container terminals, which would ease capacity constraints and increase berth productivity considerably. However, the issues around congestion at these ports can cause significant obstacles to port operations until these projects are completed, with new terminals expected to be commissioned at least three to five

years or 2013 - 2015. The ICD Integration Program could address these issues effectively, ensuring smooth operations at these ports in the interim[1].

The main thrust of the ICDs Integration Program is relocating all container processing activities from the marine terminals to ICDs, including all the handling of outside trucks. This "cleaning" of the marine terminals requires the integration of the ICDs with marine terminals. This integration means that the ICDs' yards substitute the marine container yards and the ICDs gates substitute the marine terminals' gate. The suggested changes are operational/institutional measures; they do not require investments in new port facilities. They can be implemented in a short time period and effectively increase capacity at these ports in the short run.

Figure 5-1. Use of Tractor for Container Transfers

With the Integrated ICDs, marine terminals will no longer need to interact with cargo owners, but only with shipping lines. A simple block storage system is recommended in the yard given all inbound boxes are destined to ICDs, which would eliminate the need for RTGs. Segmentation of the marine terminal into berth and gate sections will improve the productivity of truck handling and the entire transfer operation under the full control of ICDs.

Road connection between ICDs and ports will be improved and traffic surrounding the ports is expected to decrease since it will be distributed to the various ICDs involved in the operations. It is proposed that shipping lines contract with ICDs, where prices would be set according to performance level, which would introduce competition between the ICDs. The Program includes a system for licensing and regulating ICDs, given that their role will increase under the proposed changes. The extra cost involving transfer via ICDs are compensated by the much higher savings arising from reduction of dwell time of ships and higher productivity of expensive port facilities and equipment.

Both Mombasa and Dar es Salaam are finalizing engineering designs for new container terminals. These projects will enter the construction phase soon, so that they will be available in three to four years to further address the congestion problems in this high growth segment of the traffic. In the case of Mombasa, it will be the first concessioning in the port and will compete with the existing KPA operated terminal. At Dar es Salaam, the existing terminal

[1] A fuller description and discussion of the Integrated ICD concept is presented in Appendix H of the Draft Action Plan Volume 2, Supporting Technical Papers.

operation is concessioned. The decision was taken to open the new terminal to international tender so as to have two operators in the port competing with each other.

DRY BULK AND GENERAL CARGO

Container traffic has tended to attract the most attention from port managers as the most visible, high growth area. Nevertheless, dry bulk has also been increasing substantially. Between 2002 and 2007, containers at Mombasa increased by 14 percent in tonnage, while dry bulk increased by 20 percent. At Dar es Salaam, container traffic increased by an average of 13.5 percent, while wheat averaged 16 percent during the same period. Therefore, while concentrating on improving the performance of container handling, it is important to seek performance improvements for dry bulk as well.

Figure 5-2.Mombasa Bulk Facilities
(Cement and Flourspar)

Both ports are giving attention to this segment of traffic, which is complex because each product is handled differently. Both ports are designating an area of dry bulk berths and seeking to develop faster handling systems. This includes installation of better cranes, conveyor belts, systematic yet flexible assignment of berths, and reviewing silo and other storage systems. Both ports are also seeking to deepen the berths to allow for larger ships that can increase port throughput and reduce operating costs for the ports and the logistics costs for the shipper. Because a major impediment to Mbaraki Wharf at Mombasa is a bridge access that limits truck size to 7 tons. Removing bulk requires two moves, with time lost, increased cost and air pollution resulting from double handling of dry product. Therefore two new access bridges are featured in Mombasa's dry bulk initiatives.

General cargo is static or has decreased as more cargo is moved in containers. In both ports, it tends to be handled wherever there is a berth with sufficient depth and availability. Both ports are seeking a plan for more effective general cargo handling, however, some of the plans cannot be realized until excess containers are removed from the general cargo area.

LIQUID BULK

The ports of Dar es Salaam and Mombasa each require the development of additional capacity to handle liquid bulk cargo. In Mombasa, Kipevu Oil Terminal handles crude oil and refined oil products and can accommodate vessels to 85,000DWT and up to 198 m long. In 2008, it was at 78 percent berth occupancy and in 2009 was at 86.5 percent. Vessel delays to berth currently cost the petroleum industry an average of US$100 million annually. The Port

of Dar es Salaam and particularly the oil terminals are congested with frequent wait times off shore and terminal delays. All these delays increase the cost of delivered fuel.

For both ports, offshore petroleum offloading facilities are planned to meet the need for additional liquid bulk capacity through design of a BOT project for a single buoy point or off shore jetty system. In Mombasa, an international tender was issued by the National Oil Corporation of Kenya in late 2010 for a technical feasibility study of the construction of an offshore petroleum offloading jetty at Mombasa. It is expected that a contract will be issued during 2011. In Dar es Salaam, the project consists of construction of the SPM and two subsea pipelines. The SPM is being constructed southeast of the harbor entrance and will accommodate ships from 40-150 KDWT.

ENHANCING PORT OPERATION WITH ICT APPLICATIONS

A community-based/single window system is essential to decrease clearance times needed to handle the level of traffic anticipated for Mombasa and Dar es Salaam. Currently, individual procedures in the port can take two to three days. And if performed consecutively, can take a total of twelve to twenty days. Other delay factors include submitted documents being incomplete, one agency taking paperwork out of the chain so it doesn't get processed, clearing agents/shippers being slow to pay fees and duties, shippers intentionally using the port/ICD for storage, not tracking location of containers, or stacking over five containers because of lack of space.

A **community based system** is designed to address this. The computer tracks procedures and payments as they are initiated and completed. This allows the stakeholders to know where the container is in the process toward release, thereby enabling interventions to complete the process. It allows coordination of port procedures through sending alerts that an action is needed and overall monitoring to identify problems to be addressed. A **single window system** allows one agency to act on behalf of all parties in entering and tracking of containers procedures. It includes all the risk parameters and requirements for most commodities so that the clearance can be completely automated and no human intervention is needed. This leads to greater efficiency and transparency.

Kenya has financing from the World Bank to develop a single window centralized in the Cabinet through the Ministry of Finance. This position enables it to coordinate all government ministries' participation. Kenya's plan is to develop and implement the system at the port of Mombasa, Kenyatta International Airport and land borders. Tanzania has conducted a feasibility study for the implementation of a community-based system. The Dar es Salaam port community is in process of setting up an organization to develop and implement the system.

These systems have the potential to reduce dwell time to three to four days overall. They enable the coordination of functions necessary to the most efficient processing of persons and goods. They facilitate optimum coordination among agencies at the port. As they track and

monitor the process electronically, they have the capacity to reduce corruption as well since they remove much of the decision making from humans to computer systems.

Lake Ports

From a macro economic perspective the cost advantages of the rail/lake system give reason for focusing on its development as a long haul alternative to a truck/highway system into the region abutting Lake Tanganyika. The Ports of Kigoma, Bujumbura and Kalemie are reasonably well developed and can easily handle containers if the shipping fleet was reconfigured to handle them. The key requirements for developing an efficient low cost container distribution system via Lake Tanganyika to the adjoining countries are:

- Frequent delivery of block trains carrying 40-60 TEU from Dar to Kigoma
- A system for rapidly transferring the containers from the rail to the lake shipping service
- A low cost shipping service calling the principal ports on the lake
- A system for rapidly discharging the vessels and turning the containers around

The cheapest and most efficient distribution system to meet these criteria would be a rail-tug/barge feeder system.

BARGE FEEDER SERVICES ON LAKE TANGANYIKA

It is envisioned that because of its rail connection with Dar, Kigoma would function as the hub port for the proposed container barge distribution services on the Lake Tanganyika. There are a number of options. Initially, an alternating pendulum service can be set in which Bujumbura and Kalemie can be serviced once a week. If multiple barges are put into service then there is the option of establishing a three or four port itinerary service depending on demand. The only investments that will be needed in the receiving ports are the purchase of yard tractors and the development of secured, hard packed, and bonded holding area for clearing customs and stripping containers as needed. Finally, because of its versatility it can also function as a truck ferry servicing the local commercial markets.

BARGE FEEDER SERVICES ON LAKE VICTORIA

Lake Victoria has a different trade and distribution dynamic. The design of each of the different ports on the lake includes facilities for the mooring of rail wagon ferries. When these were developed in the 1960-70s the national railroads of Tanzania, Kenya and Uganda were a part of the now defunct East Africa Railways Corporation and was operated as one coordinated system. Currently, there are two separate railroads, the TRL serving Mwanza and Port Bell and the RVR serving Kisumu, Port Bell and Jinja. The natural competition therefore is between the TRL at Mwanza and RVR in the other ports. A second competitive option is for RVR to improve their rail track and service to Kisumu and offer a cheaper short cut service to

Port Bell in Uganda. In the past both this services have been offered using rail wagon ferries. However, the operating and maintenance costs of these vessels combined with a low carry capacity greatly increases the economic risk of such a venture in the present circumstances.

Figure 5-3. Cargo Handling at Lake Port

There are several options for developing container distribution services on the lake. One option is to convert the working rail wagon ferries to RoRo operations handling containers on chassis which with proper loading could increase their container carrying capacity by 15-25 percent. The logical services would be Mwanza to Kisumu or Mwanza to Port Bell and Kisumu to Port Bell. However there are problems associated with this option. First of all the vessels are old and require extensive maintenance. Also, they are expensive to operate, and because of their inherent design limitations cannot maximize their revenue capacity to operating cost ratios in comparison to a tug barge operation. Therefore the preferred option would be to design a RoRo barge that can utilize the rail wagon mooring facilities at each of the ports while more than doubling the carrying capacity of the vessel per voyage. For this option the rail link system would have to be modified to facilitate the easy on and off movement of the trailers and containers. As in Kigoma the rail links into Mwanza and Kisumu will need to be improved and holding yards must to be developed as well. More importantly the ports need to be equipped with reachstackers or heavy forklifts to transfer the container from the flat cars to chassis and vice versa. Needless to say chassis pools would need to be developed in both rail head ports.

DEVELOP VESSEL MAINTENANCE CAPACITY ON LAKE TANGANYIKA

There are old vessel building and repair facilities (slipway/dry docks) at the ports of Kigoma, Kalemie and Bujumbura, with different capacities and technical capabilities. However, there have been complaints by some vessel operators of inadequate of capacity. In addition complaints have also been made on unfair treatment or discrimination by some owners of these facilities. Furthermore, with the drive to redevelop Lake Services, involving acquisition and deployment of newer vessels, as well as enhance safety standards, there is need to develop adequate capacity to handle vessel building, assembling and repairs. This capacity should also be developed and managed as common user facilities to service vessels from all countries.

Each main port (Kigoma, Kalemie and Bujumbura) has some repair facilities managed by respective Port Authorities. An assessment of these facilities is required to determine a strategy for development adequate and integrated vessel repair facilities on the Lake. The strategy should include an institutional framework to ensure access by vessels irrespective of their country of origin and steps to promote and secure the interest of potential investors and managers of the facilities.

ENHANCE SAFE NAVIGATION

The Lakes do not have up to date navigational aids to guide safe sailing of vessels. The certification and licensing of vessels and crew is also not harmonized among the countries allowing ship owners to operate a wide variety of vessels to different standards. Furthermore, there is no credible and effective search and rescue on the Lakes. Given this state there is no credible safety environment on the two Lakes. Partly due to this many avoidable accidents happen and major accidents have resulted in huge losses. The most dramatic accidents include the sinking 30 km off Mwanza port of MV Bukoba, a passenger steamer with capacity of 430. This accident, which occurred in 1996 resulted in the drowning of approximately 800 people. Rescuers were brought in from as far as South Africa. The other major accident was the collision of two wagon ferries in 2005, resulting with the drowning and loss of one of them. Enhancing safety regulations will create conditions for avoiding some of these accidents and losses.

Safety issues are included in the two main initiatives for the two Lakes: the Lake Victoria Basin Commission (LBVC) and Lake Tanganyika Basin Commission (LTBC) under which comprehensive development and investment strategies are being pursued. Key aspects include:

- Undertake/complete hydrographic surveys and install lake-wise and port navigational aids for safe passage of ships;
- Adopt recognized classification society rules regarding construction of ships/vessels;
- Introduce meteorological navigational warnings and other services;
- Establish search and rescue organization and adopt a harmonized implementation policy and strategy, including the possible use of *Global Maritime Distress Safety System* (*GMDSS*); and
- Harmonize port security, safety and environmental compliance strategies.

Rail

The East Africa regional railway systems are not functioning as they should, in virtually all respects – poor reliability, high accident and failure rates, high costs, low volumes, financially loss making and not operationally sustainable. The reasons for this have been well debated

and studied for many years and are also well understood – initial loss of volumes and income from road transport deregulation, followed by lack of investment and deferred maintenance, leading to declining reliability and further loss of traffic.

The future development strategy for railways in East Africa will be governed by the need to further develop and upgrade existing systems and to invest in new systems, in order to minimise the overall effects of increasing oil prices and more stringent environmental targets. Despite the ongoing poor performance of the railway systems in Africa, there seems to be no other option than to work towards a revival and expansion of the railway services, with the lead taken by government commitment and investment in infrastructure, supported with development partners, and to encourage and permit private sector participation in operations.

The only feasible option is for the railway operators to prepare realistic and detailed business plans, focussed only on the core activities necessary to increase targeted bulk and intermodal freight volume. Detailed cash flow projections will have to be prepared, linked to performance targets and agreements / MOUs with key customers, showing the long term and short term financing requirements. Experienced management support will be necessary to prepare the business plans, to present the plans to potential funders and to implement them – it seems likely that donor support could be found for the cost of the initial management input in case of such need. Alternatively this could be sourced from private financing where possible such is the case for RVR.

In simple terms, the regional railways will all have to increase their freight volumes substantially in order to become viable. The regional railways will need to target the container sector in order to achieve the threshold volumes – this will lead to increased competition with road. Focusing on bulk traffic will in most instances not be enough. The main problem is that there is not enough traffic to go around. Building new lines and linkages will not be viable without significant improvement of the current system, unless linked to specific contracted anchor projects (such as the possibility of the nickel mining sector in Tanzania or the oil sector in Uganda).

REVITALIZATION STRATEGY FOR TRL

It is proposed that donor funding be sought for the appointment of a new experienced management team, which should prepare a realistic business plan, based on core business, to serve as a basis for refinancing of TRL. It is estimated that investment of the order of US$110 will be needed, excluding rolling stock, but including working capital. The TRL service remains critical for serving the eastern DRC, Rwanda, Burundi, and to a lesser extent Uganda, both in respect of international and regional trade. Given the recent experience, the possibility of a new railway concession is not appealing. The Kenya railway operator, RVR, through its new shareholder Citadel, has expressed an interest to operate its own trains on the TRL system, and Burundi logistics companies have expressed the same interest, if the TRL line can be extended into Burundi territory. TRL will have to target the intermodal freight sector in order to achieve the minimum freight volume required for financial viability.

Priority investments to improve infrastructure in support of TRL revival plan include:

- Enhance capacity by replacing light rails with heavier sleepers and rails of 80 lb/yard and rehabilitating bridges to at least 25 axle load capacity.
- Rehabilitation of track especially between Kilosa and Gulwe stations i.e. bridges to at least 25 t axle load capacity (area of recent washaway).
- Rehabilitation of rolling stock
- Lease rolling stock.
- Construction of inland container terminals at Ilala (Dar es Salaam), Shinyanga (Isaka) and Mwanza in order to assist decongestion of containers at the port of Dar es Salaam.

REVITALIZATION STRATEGY FOR RVR

The main commercial shareholding in RVR has been taken over by Citadel of Egypt, a resourceful financial services group with major investments in transport infrastructure and operations. RVR has concluded a management and technical services agreement with América Latina Logística (ALL) of Brazil, an experienced railway operator. RVR has expanded the Ugandan concession to include the Tororo – Pakwach section. Rehabilitation of the worst sections of track in Uganda and Kenya has commenced. The RVR lake ferry service between Kisumu and Port Bell has been revived. Priorities for the short term include:

- Target to increase traffic from current 1.5 mtpa to 4.5 mtpa during first phase – implies a shift of traffic from road to rail.
- The two Uganda wagon ferries are due to be returned to service during 2011, and will likely be used on a triangular service Port Bell – Mwanza - Kisumu
- Commence track repair and upgrading in worst sections – Jinja section in Uganda, in order to improve reliability, track capacity and transit times
- Commence locomotive rehabilitation and resume maintenance procedures in order to reduce locomotive failures
- Increase freight volume - target container sector, operate block trains develop and expand intermodal terminals at Nairobi and Kampala
- Resume lake ferry services from Port Bell and Kisumu

Priorities for the medium term include:

- Improve rail access to the existing and future container terminals – operate longer scheduled block trains from the port
- Target Ugandan oil sector as a major anchor customer.
- Motivate increased state investment in upgraded track infrastructure, Kenya and Uganda – gradually upgrade track to more than 20 t axle loads

- Integrate and coordinate future planning with KPA Lamu Corridor programme

ESTABLISH REGIONAL RAILWAY SAFETY REGULATOR

The RVR in Kenya and Uganda and TRL in Tanzania share a common track gauge of 1,000 mm and similar technical specification in respect of wagon coupling systems. The respective railway safety regulators enforce the provisions of the railway acts in each country in respect of track and equipment condition, operating procedures, including speed restrictions. Speed restrictions and limitations on train lengths are intended to ensure safe operation conditions (prevent derailments). In practice, with each country having its own safety regulator, when trains are moved from one system or country to another, locomotive and train crews are switched. This solves the problem of accountability in the event of an accident. At the interchange point, the wagons are inspected and those with faults or safety issues are held back. This process is time consuming and disruptive – very often consolidated loads are broken up because of wagon faults, or trains are delayed because of the unavailability of locomotives at the interchange point. A safety regulator which covers all three countries – Kenya, Uganda and Tanzania (and in future Rwanda and Burundi) would allow the operation of seamless train services between the different systems and countries, with joint wagon safety inspections carried out at the points of departure, rather than the interchange points.

Figure 5-4. RVR Derailment

Safety regulation of railway operations fall under the respective ministries of transport in Kenya and Uganda, and under a specialized unit in Tanzania, SUMATRA (Surface and Maritime Transport Authority), which is also responsible for transport economic regulation. There has been no attempt or initiative to set up a regional railway safety regulator, mainly because of the general decline in railway services in both corridors and the problems experienced with both the TRL and RVR railway concessions. However, the RVR revival process is now underway, with the TRL revival being planned, and improved interoperability will be a key success factor.

A study is recommended to investigate and propose a structure for the establishment and operation of a regional railway safety regulator and the linkages to the various national transport safety regulators. This will be confined to the Northern and Central Corridors only, rather than the EA region, because of the limited geographical coverage of the 1,000 mm gauge system.

Roads

ROAD INFRASTRUCTURE

As described in Chapter 2, an assessment of Northern Corridor road network was carried out by Aurecon for the East African Transport Strategy and Regional Road Sector Development Program conducted for the EAC in 2010. This assessment resulted in the identification of three categories of road improvements:

- **Upgrade Road Capacity** - Immediate remedial action, in terms of proving additional capacity principally by adding lanes (e.g. climbing lanes or extra lane(s) for the whole identified length) is recommended for roads with level of service E and F. Roads with LOS D and C are to be investigated for remedial action later.
- **Rehabilitation of Paved Roads -** is triggered for a paved road once its overall condition has deteriorated beyond the point where preventive and routine maintenance can uphold the pavement at a functional level.
- **Upgrade to Paved Standards** - Gravel roads with traffic volumes in excess of 200 vehicles per day operate under poor riding quality conditions and generate excessive costs to road users as well as escalating routine maintenance costs to the road authorities.

LIBERALIZE TRANSIT REQUIREMENTS

In the Corridor states, road transport regulation included carrier licensing and safety regulation, periodic testing for vehicle road worthiness and driver ability. Kenyan and Tanzanian road transporters carry most transit goods in the EAC. In 1995, Kenya transferred the registration and licensing of vehicles to Kenya Revenue Authority. EAC customs regulation requires that vehicles carrying goods in transit and/or under customs control be licensed. In Kenya, vehicles licensed for transit cannot carry domestic cargo and must use prescribed transit routes. This has the effect of many return trips being empty. Similarly in Tanzania, the issuing of licenses for goods carrying vehicles was abolished. Registration with SUMATRA requires proof of vehicle inspection, third party insurance and registration with Tanzania Revenue Authority (TRA). Through these systems, Kenya and Tanzania restrict road transporters use of their vehicles causing transporters to incur the full cost of a round trip to make a one way delivery. Shippers are often billed for a round trip when they only need to have goods hauled one way. The current regulations need to be reviewed to find a means of avoiding diversion of goods into the local market without unduly raising the cost of providing transport services.

The Tanzania Revenue Authority has experimented with permitting truckers to load backhauls using transit vehicles provided the truck follows the prescribed transit route and reports to TRA check points along the route and to TRA at the conclusion of the trip. While adding to the delays for domestic haulage, it enables the vehicle to return loaded. This system could be tried in Kenya as well, or another system identified. The implementation of

the EAC Common Market Protocol, which began on July 1, 2010, has the goal of liberalizing the transport market. In the Protocol, however, Kenya reserved the right to restrict transport operators from other countries to establish a commercial presence in Kenya. Broader issues of market access need to be resolved in EAC.

It is recommended that the EAC facilitate discussion between public and private sector stakeholders on phasing out licensing of transit vehicles and vehicles carrying goods under customs control (possibly using TRA approach as starting point). From this dialogue, options should be identified that improve transport efficiency and cost while recognizing the revenue concerns of customs. The proposed option should be piloted on the two corridors and refined based on the pilot. Once a system has been agreed among the agencies involved, the regulations should be modified to accommodate the solution. A system for monitoring impact should be part of the proposal.

Success will depend on the willingness of all parties to engage in a dialogue and commitment to finding a workable solution. The pilot will need to be conducted in such a way that it produces quantifiable results and the parameters for new transit regulations. The resulting regulation should be linked to, but not dependent on, the implementation of a regional transport licensing agreement.

HARMONIZE ROAD TRANSPORT POLICY

The EAC treaty commits Partner States to implementing a common road transport policy (Art 90). The EAC States have partially given effect to this commitment by concluding the Tripartite Agreement on Road Transport in 2001. The Tripartite Agreement provides a common framework for regulating cross-border road transport and introduces a variety of facilitation measures to improve operational efficiencies. To date, the Tripartite Agreement has not yet been implemented, mainly due to the absence of enabling domestic laws. Moreover, states are still individually pursuing national policies with objectives which are at times in conflict with their commitments under the Treaty.[2]

Domestic road transport policies in all states are aimed at deregulated market access, which has had some positive effects, but the lack of qualitative regulation has also had several

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[2] These commitments include harmonising the provisions of their laws on traffic and licensing, establishing common measures for the facilitation of road transit traffic, adopting common and simplified procedures for road transport documentation and harmonising road transit charges, reducing and eliminating non-physical barriers to road transport, ensuring that common carriers from other Partner States have the same opportunities and facilities as common carriers in their territories in the undertaking of transport operations within the Community; ensuring that the treatment of motor transport operators engaged in transport within the Community from other Partner States is not less favourable than that accorded to the operators of similar transport from their own territories and making road transport efficient and cost effective by promoting competition and introducing regulatory framework to facilitate the road haulage industry operations.

undesirable consequences. These include low entry barriers leading to cut throat competition, low safety levels and poor service quality. Operational standards need to be improved and governments need to align their policies to encourage the growth of a professional transport industry which is able to compete effectively within a framework of clearly-defined rules and appropriate regulation.

We propose that short term assistance be provided to support EAC states to implement the Tripartite Agreement. This is required to:

- Revise existing legislation and adopt new legislation to domesticate the Agreement in the national laws of the member states;
- Design licence application, adjudication and issuing procedures and forms;
- Design license administration software systems and procure hardware;
- Train personnel in the handling of applications, adjudication and issuing;
- Train law enforcers in the application of on-the-road enforcement of the rules under the Agreement;
- Develop transport supply and demand capacity to manage competition between carriers from different states; and
- Undertake monitoring and evaluation.

Medium term assistance will help EAC states align their road transport policies and implement complementary regulatory policies for national and international transport. Such policies and regulations must be aimed at developing a professional road transport industry characterized by a progressive improvement in quality and safety standards. Technical assistance is required to:

- Design the features of the policy/ regulatory system through a process of stakeholder consultation;
- Develop an appropriate institutional framework;
- Draft an EAC Road Transport and Traffic Act and implementing regulations;
- Define standards for access to the road transport profession;
- Develop procedures for evaluating applicants and issuing operator licenses;
- Design support software and procure hardware to operate a multi-module database;
- Conduct training of regulatory and law enforcement personnel; and
- Undertake monitoring and evaluation.

Due to the multilateral nature of the Tripartite Agreement, successful implementation depends on comparable levels of commitment from all Partner States. Similarly, national measures need to be coordinated to ensure that progress is synchronized in all states to ensure concurrent implementation. Multilateral arrangements similar to the Tripartite Agreement have delivered proven benefits elsewhere (e.g. Southern Africa) in terms of improved transport efficiencies and competition, reduced costs, etc. Similar benefits can be expected to be derived from implementation of the Agreement in East Africa.

IMPROVED VEHICLE OVERLOAD CONTROL SYSTEM

Article 90(l) of the EAC Treaty commits the partner states to adopt common rules and regulations governing the dimensions, technical requirements, gross weight and load per axle of vehicles used in trunk roads within the Community. Under the guidance of the EAC Secretariat and with donor support, partner states reached agreement in July 2008 on the harmonization of axle mass loads, gross vehicle mass limits, the adoption of a formula for the protection of bridges and tolerance factors for overloads (i.e. grace percentages which do not attract penalties). Agreement was also reached to ban quadrem axles and to decriminalize overloading by adopting a system of administrative penalties to recover the economic cost of damage inflicted by overloaded vehicles.

All states are making major investments in improving road infrastructure, including in some cases, contracting for road management by private firms. Effective overload control is essential to extract maximum economic benefit from this investment. Investment in railway systems is also ongoing and the ability of rail to compete effectively with road transport also depends – significantly - on effective measures to combat overloaded trucks.

Despite the agreement reached in 2008, there has been little progress by Member States in amending their legislation to adopt the harmonized regional standards. Moreover, only Tanzania has introduced the agreed system of administrative penalties based on the recovery of actual economic costs of road damage.

Existing overloading control strategy is aimed at achieving 100 percent inspection of all commercial vehicles. There is no targeted risk management approach and no incentive to encourage truckers to self-regulate. The high intensity of checking increases journey times and provides an added incentive for corruption. Differences in national limits complicate cross-border operations. There is also no regional consistency in terms of the frequency of checks as some states (Burundi, Rwanda) have no existing weighbridge infrastructure.

Experience elsewhere has highlighted that the efficacy of overload controls is improved when the trucking industry is fully cognizant of the content of the new rules and their application. Outreach activities to sensitize the trucking industry to the implications of the new rules are useful to ensure smooth implementation of the administrative system and to secure the co-operation of industry – from an early stage – to improve compliance levels. At the same time, training of weighbridge staff and law enforcement officers in the implementation of the new rules is also needed. Provision therefore needs to be made to conduct workshops and information sessions with the trucking industry (once legislation is finalized) and to hold practical training sessions with weighbridge personnel and enforcement personnel.

Technical assistance is initially required to assist member states to align legislation on vehicle limits with regional standards and to pass new regulations providing for administrative penalties. All states need to revise legislation to adopt the regional limits, although Tanzania has already adopted new rules providing for administrative penalties.

In the longer term, technical assistance can be extended to develop a regional overloading control strategy which utilizes targeted enforcement techniques based on risk management. This includes focusing on specific vehicles and cargo types prone to overloading, establishing databases to develop profiles of frequent offenders and adopting additional enforcement measures to target high-risk truckers. Additionally, measures to encourage self-regulation, such as the accreditation of compliant truckers who qualify for more lenient treatment based on their compliance records, can be introduced.

Co-operation by line function ministries and Attorney-Generals' Chambers to process legislation is a critical precondition for success. Without a legislative basis, the remaining components of the technical assistance cannot be implemented.

REDUCE INFORMAL PAYMENTS ON CORRIDORS

Both corridors suffer from serious delays caused by informal stops and check points on the route. Some are officially sanctioned and some are created to collect payments to police, transit authorities and local communities. Without sufficient law enforcement vehicles, stationary control points to check for driving licenses, vehicle registration, vehicle road worthiness certificates and to inspect vehicles for contraband and trafficking are essential. Nevertheless, unofficial stops delay transit transport and add cost to transport which is passed on to the shipper. In other cases, they are payments to avoid regulatory control, such as payments especially on the Northern Corridor to avoid overloading controls. It will require a concerted effort by governments, individual agencies and the road users to end this problem. Studies on the Northern Corridor suggest a cost as high as US$900 per TEU is added by informal stops. Road transporters on the Central Corridor report that the cost is from US$50-100 TEU.

Figure 5-5. Police Stops on Corridor

Efforts have been made by organizations, such as the Private Sector Foundation and the East African Business Council to monitor the situation and to lobby for better control over informal stops and payment demands. These efforts need to be actively supported and expanded to reduce this practice. We recommend a technical assistance program to work with police departments to set up an internal monitoring unit and to design their own programs to control the number and frequency of official stops and to eliminate other stops. A component of the program should be training on integrity and the impact of the current situation on police credibility and trade. In addition, a public information program will be incorporated to discourage payment of bribes and encourage reporting of officers requesting money. This program should involve both presentations at appropriate meetings

and a series of TV and radio spots broadcast at high volume times and concentrated within a specific period.

The NCTTCA and CCTTFA should be involved in the effort to promote integrity on an on-going basis and have some funds to begin a process of monitoring the roads for compliance. One of their roles would be to work with agencies involved to maintain the vigilance and incentives for mostly unimpeded transit on the highways. The TA would fund setting up a program for long-term monitoring and stakeholder awareness by the corridor groups that is sustainable.

Border Posts and Transit Facilitation

MAXIMIZE CUSTOMS UNION IMPLEMENTATION BENEFITS

The Customs Management Act (CMA) establishes the common external tariffs and reduction formula for reduction of internal tariffs that is currently being implemented. The regulations for implementing the CMA have been approved, and procedures are now being developed. Adoption of a regional external tariff collection system is one of the issues still being determined. Since this system will have a considerable impact on the national transit regulation administered by customs authorities, it will also have a direct impact on the cost and efficiency of transport on the Northern and Central Corridors. Customs controls include such restrictive measures as permitting vehicles for either domestic or transit haulage, escorting, frequent customs stops on major corridors. Therefore it is important that the system take into consideration transport cost and efficiency.

The EAC Customs unit in the Secretariat is currently working on the tariff collection system and seeking agreement of all member states. In meetings with national customs authorities, it was evident that the national revenue authorities are not consulting with transport agencies in developing transit regulations. It is the right time to provide insight on the impact on transport charges, operational efficiency and vehicle utilization.

Technical assistance is proposed to review the transport cost, time and reliability impact of various proposals for full implementation of the Customs Union. The purpose is to propose a series of recommendations to the EAC Secretariat and the national governments on the impact of each collection method on transport efficiency and trade development within the Community as well as external trade. The goal is for these impacts to be taken into account when the decision is taken by the partner states on the collection system.

OSBP IMPLEMENTATION

The East African Community has made a commitment to reducing the time spent at borders and inland clearance by introducing One Stop Border Posts. The objective of a One Stop Border Post (OSBP) is to enhance trade facilitation by reducing the number of stops incurred in a cross border trade transaction by combining the activities of both countries' border

organizations at a single location with simplified procedures and joint processing and inspections, where feasible. It is also designed to reduce on the time taken to clear passengers at the border. EAC has common regulations for the implementation of the Customs Union. Procedures are currently being developed and should be adapted for OSBP. Repetitive processing at borders and manual entry of data creates inefficiencies.

In 2010, an EAC legal framework for OSBP was developed with assistance from JICA and approved up to the Multi-sectoral Council of Ministers. The draft EAC OSBP Act, which establishes the legal authority and procedures for OSBP, will be introduced to the EAC Legislative Assembly in early 2011. JICA is funding a project to develop a resource document for OSBP implementation based on current experience and lessons learned at other OSBP, particularly within Africa.

Figure 5-6. Rusumo Border Posts

OSBP are complicated, because of the number of agencies at the border, the lack of a single agency manager and the need for simplified and harmonized procedures. As EAC continues the implementation of OSBP, it is essential that there is coordination so that common procedures and joint inspections are developed as much as possible.

Technical assistance is proposed for the Customs unit in EAC Secretariat to finalize and obtain consensus on OSBP procedures and an oversight mechanism to insure common development of OSBPs. Three consultative workshops are planned for technical agreement on proposed procedures. The EAC OSBP Act establishes most aspects of operations of an OSBP. It allows for divergence of procedures as required by geography or other factors. It is also necessary for each border agency to determine how they will carry out responsibilities in the new arrangement. It is also necessary to determine how joint scanning, joint inspections and other special procedure will be implemented at OSBPs.

Border management information systems are needed for single electronic entry of data and information-sharing. The initial entry into a single data base, sharing of information and handling of preclearance of cargo for compliant customers should be built into the system. It should also take into account the future changes that will need to occur with further implementation of the Customs Union and Common Market.

For implementation of OSBP to be successful, all the components should be coordinated and synchronized: legal framework, appropriate engineering design and traffic flow, simplified

procedures and ICT applications to enable electronic transfer of information, payments etc. Failure to carry out any of them effectively will diminish the benefits achieved. ICT connectivity needs to be established early in the development process, so that applications can be developed, tested and training completed in advance of the border opening.

STREAMLINE CUSTOMS BORDER CLEARANCES

Insufficient use is made of customs tools to expedite processing. Clearance modernization is being implemented at the national level and the extent of implementation is varied. Tools include risk management, accredited economic operators, customs bonds and control points, preclearance and so forth. There is need to review current and new procedures on a corridor basis to insure that common procedures are developed and that information collected at one point is available to all transit borders. This both expedites transit and reduces the opportunity for filing different information at different borders. It increases the transparency of trade. A variety of initiatives have been taken to modernize and harmonize customs clearance procedures. Further implementation and coordination of efforts is needed to arrive at a harmonized system for these two corridors. Since Uganda, Rwanda and Burundi use both the Northern and the Central Corridors, it is important to harmonize the systems used on both corridors. Burundi converted a government customs department to a Revenue Authority in April 2010 and is making a series of changes in its clearance procedures. This is a good time to insure that the transition in Burundi is coordinated with development in the other countries along the two Corridors. Further training and harmonization throughout EAC is needed to achieve the full benefits.

As some countries move clearance procedures to the borders, such measures will become even more important to insuring that revenue is collected without unduly delaying trade. Uganda allows clearing and forwarding agents to submit documents in advance and prepay duties based on their calculation, but document review and duty assessment is done at the border or in Kampala at the determination of the importer. Preclearance linked to prepayment is another tool to be implemented in the partner countries. The World Customs Organization is supporting this kind of initiatives and should be a resource to draw on for information and potential support.

A coordinated program of regional training/capacity building on customs modernization tools followed by regional technical assistance on implementation at national level and harmonization at regional level will result in more streamlined border operations. The training and capacity building must involve the border control agencies and the private sector. A second technical assistance effort is proposed to produce harmonized regional guidelines and programs implemented at national level.

Many of the customs tools involve the electronic transmission of data and payments. The success of this training and TA is dependent on the implementation of reliable interconnectivity between borders and headquarters and among the countries. It also requires reliable, inexpensive data connectivity for the private sector to customs and between

clearance points and the borders. The experience of Rwanda demonstrates that where connectivity is available the private sector will incorporate it into its operations so that they also enhance the operational efficiency. Success also depends on the continued commitment of Revenue Authorities to modernize procedures and to see transit efficiency as an important goal. EAC has mechanisms in place for harmonizing procedures throughout the community and needs to use them for this effort. It is independent, but related to OSBP implementation in that a primary objective of the OSBP is to achieve simplified, harmonized procedures. If this initiative is completed, the main issue for the OSBP implementation concerning procedures is how they can be carried out in the neighboring country in the same facility and what further efficiencies can be obtained from operating in proximity and where possible, jointly.

IMPLEMENT EFFECTIVE TRANSIT REGIME

To be competitive, a corridor should offer seamless movement to travelers, tourists, vehicles and cargo. Transit needs to be seen as an integrated system of shared information, effective guarantees, and a commitment to speed and service. It can best be achieved on corridors, building to an EAC level system. It also requires cooperation among government agencies such as customs, road authorities, police, etc.

There are many efforts to streamline and harmonize transit regulations within the East African Community, but many of them have not been implemented. Some have not been agreed at regional level, some have been agreed at regional level and not domesticated in national law and some have been domesticated and still not implemented.[3] Failure to implement impedes transit movement in terms of cost, time and reliability. Many aspects of a transit regime exist, but have not been fully implemented. Common vehicle regulations have been issued, but not fully implemented and there are current efforts to change again. Road worthiness standards have been promoted, but there is lack of trust in the systems of other EAC partner states. Customs declaration have been simplified and harmonized, but each country still requires its own form under national insignia. While they can be filed electronically, they cannot be modified and most countries still require the hard copy as the legal copy. RADDEx and the common customs bond have been partially implemented in EAC. There is need for a more coordinated, pro-active program of implementing a single system.

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[3] Key elements include: (1) common vehicle dimensions need to be agreed and enforced. Otherwise drivers are restricted to the lowest dimension or weight. (2) joint recognition for road worthiness testing and certificates so that insurance such as the yellow card can be effectively employed. (3) aApplication of a single administrative document by customs on both corridors (entered electronically once, downloaded and modified as needed by each country). (4) full implementation of RADDEx for vehicle and cargo tracking on both corridors and immediate acquittal of customs bonds when goods cross the border. (5) agreement on full sharing of information on the corridor. Implementing an effective transit regime is done issue by issue, but also requires an overall vision and monitoring to achieve a coordinated outcome.

The transit regime can most easily be implemented on corridors where the impact of failure to act is immediately felt. Customs items will be affected by the fuller implementation of the Customs Union. It is assumed that the measures recommended here are important to the current transit regime and will be modified or eliminated according to decisions taken on the external tariff collection system and phase out of internal tariffs. Technical assistance is proposed to achieve the following:

- Implementation of harmonized vehicle weight and dimension standards and enforcement with a goal of weighing only at port, border (s) and destination.
- Recognition of road worthiness testing and certificates by all authorities and insurance agencies. Assistance to programs that are weak, either in testing capacity or enforcement.
- Single customs document produced once with a copy for all customs agencies and copy retained by driver with stamps from all customs agencies. Conversion to and regional recognition of electronic entries, verification and release.
- Full implementation of RADDEx in all Corridor countries to allow effective tracking. Application of tracking systems for customs, vehicle agencies, and forwarders/shippers using RADDEx.
- Common customs bond administered on each corridor and later adopted in the region. Immediate acquittals of bond at conclusion of journey.
- Agreement for full sharing of information on the corridor.

Integration of National & Regional Transport Policies

The partner states of the EAC are committed to developing a Common Transport Policy as part of their obligations under the Treaty (Article 89). The themes and thrusts of the proposed Common Policy, as elaborated in the Treaty, cover all critical infrastructure, operational and regulatory components needed to progressively improve the performance of the two corridors.

Work on the development of the Common Policy is still sporadic and fragmented. Progress with the development of common regulatory frameworks is most advanced in road transport and to a lesser extent, inland waterways[4]. Yet, while states have reached agreement on principles, this consensus has not yet resulted in operational improvements. Progress has been stymied by a lack of concrete implementation. This has several causes. Domestic legislation required to implement regional agreements has not yet been adopted. More significantly, transport policy in all states is still overwhelmingly skewed towards national priorities. While these policies acknowledge the regional dimension, they do not elaborate

[4] With the adoption of the Tripartite Agreement on Road Transport in 2001 and the Tripartite Agreement on Inland Waterway Transport in 2002.

specific programs or initiatives aimed at implementation of regional instruments. Lastly, capacity to develop and implement policies is constrained in all states. Inevitably, this results in a reactive approach to policy implementation.

A common problem is that policy development tends to take too long. This means that events sometimes overtake polices as they are being formulated. This undermines the relevance of specific policies and results in policies never being approved. A second challenge is to improve capacity to undertake policy monitoring and review. Policy-making is a continuous process. Once adopted, a policy can become outdated fairly quickly. Remedying these deficiencies cannot be achieved overnight. Various strategic interventions are needed to create and sustain policy frameworks that will deliver improved corridor performance. Such interventions are needed both regionally and nationally. At the same time, strategies must be coordinated to ensure that regional and national interventions remain in step and mutually support the overall objective of improved corridor performance.

All states have national transport policies, while regional frameworks are still underdeveloped and fragmentary. Hence, a start needs to be made at the national level to align national policies more closely to ensure that states are truly pursuing complementary objectives. To this end, national policies must (a) clearly identify the regional commitments which governments have assumed, (b) identify national measures required to implement regional decisions and (c) set definitive timelines for implementation.

In parallel with national policy harmonization, a start needs to be made in preparing a Common Transport Policy as set out in Art 89 of the EAC Treaty. This is a longer term objective, but one which can be approached in a phased manner, preferably starting with road transport as the dominant mode. The aim must be to develop a common vision for the regional transport sector, backed by harmonized policy goals and programs giving effect to existing regional instruments such as the Common Market Protocol and the Tripartite Agreements on Road Transport and Inland Waterways. Additional instruments will need to be adopted to formalize the Common Policy. A Protocol which captures the main policy goals and details the implementation measures is likely to be needed. Operational details could be elaborated by way of an EAC Road Traffic and Transport Act (or Acts) adopted by the EAC Legislative Assembly. This may be followed by other Acts governing other transport modes.

Thirdly, governments need to bolster their policy formulation and implementation capacity. The capacity of the EAC Secretariat must be strengthened with the appointment of a full-time policy advisor. The role of the transport advisor will be coordinate the development of a common policy, to assist national governments in aligning national policies with regional objective and to monitor policy implementation on behalf of the sectoral Council. Similarly investment in capacity is needed in all member states.

Infrastructure Financing through PPPs

Adopting rules on PPP project identification, preparation and procurement is now generally accepted as best practice within developing countries that desire to attract more investment through PPPs. Only Kenya has adopted such rules to date, while Tanzania has adopted a new Act which still requires refinements to meet best practice[5].

PPP project implementation capacity is limited in all states and the lack of capacity is reportedly one of the factors that has created difficulties with PPP implementation, e.g. in the railway sector. A PPP unit has been established in Kenya and legislation now provides for similar institution(s) in Tanzania. As yet, there are no PPP units in Burundi, Rwanda or Uganda.

Given the difficulty in building national PPP capacity, the option of establishing a regional PPP unit should be considered to provide services for national projects and support for future regional PPPs. The advantage of a regional unit would be to pool scarce expertise and thereby develop stronger PPP capacity than national governments may be able to build individually. A regional unit could develop into a centre of excellence and provide advisory services as and when needed for individual national projects. At the same time, it could act as support unit for regional projects which may in future be undertaken as PPPs. Technical assistance would be required to:

- Study institutional options and define the status of the unit within the overall structure of the EAC;
- Define the role, functions and duties of the regional unit vis-à-vis national units and contracting authorities;
- Recommend an organizational structure and staffing;
- Propose funding options; and
- Recommend and draft an appropriate legal instrument to establish the unit.

Leadership by NCTTCA and CCTTFA

Many of the infrastructure and facilitation improvements should be done on a corridor basis. Improvement is a dynamic process driven by dialogue between public and private sectors. NCTTFA and CCTTCA are best equipped to lead and monitor the process at the corridor level. The role of both entities is to insure effective operation of transport, logistics and trade on the corridor in the interest of all member countries. With this mandate, they are ideally suited to promote the infrastructure, facilitation and legal and regulatory framework to

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[5] A private member's bill has been tabled proposing the adoption of an EAC Public Private Partnership Act. However, the legislation has been delayed as some provisions are viewed as being inappropriate to the needs of individual states.

strengthen corridor infrastructure and operations. These two organizations have specialists on staff for infrastructure, facilitation and trade and some resources provided by members. Nevertheless, they need assistance to develop a sustainable plan for advocacy and fostering stakeholder actions for improvements.

The NCTTCA is well established, but needs a way to more fully engage their public sector members in the improvement process and to more fully incorporate the private sector in identifying problems and solutions. As it implements, it needs access to some additional technical assistance and field work on a demand basis. NCTTCA needs to create a stronger mechanism for delivering this commitment of both public and private sectors. Once initiated, progress toward agreed outputs would be assessed and redirected every six months. NCTTCA has tended to rely on donor support and outside consultants. They should seek to encourage active involvement from their members to make the activities sustainable and to reduce the dependence on outside consultants.

CCTTFA is currently finalizing staff appointments and developing its work plan. Its Board, which has equal public – private membership, would lead the process for CCTTFA and create the link between Corridor group and national government action. CCTTFA needs to set up their operational structure and mode of operation. It will depend on member buy-in to be successful.

6. Proposed Projects for Improving Northern Corridor Performance

In this section we present an overview of specific infrastructure projects that have been identified to improve the performance of the Northern Corridor in the next five years. Projects were selected for the Action Plan based upon the strategies for improving the Northern Corridor performance described in Chapter 5 and their potential to have a significant impact on the corridor's performance in terms of time, cost and reliability. All of the proposed projects are also deemed to have a medium to high economic viability.

The projects are presented by transport mode in the sections below. Detailed project profiles of these proposed infrastructure interventions are presented in Appendix A. The profiles include the background and rationale for the project, agencies involved, a description of major components, critical factors for success, related projects and expected benefits/impacts. Cost by major component is provided along with the investment start date, duration and PPP potential.

Mombasa Port

Four infrastructure projects are proposed for Mombasa Port with a total cost of nearly US$ 400 million (Table 6-1). Together these projects are expected to reduce price in Mombasa Port by 15 percent, time of port operations by 42 percent and improve the reliability of port services by 69 percent.

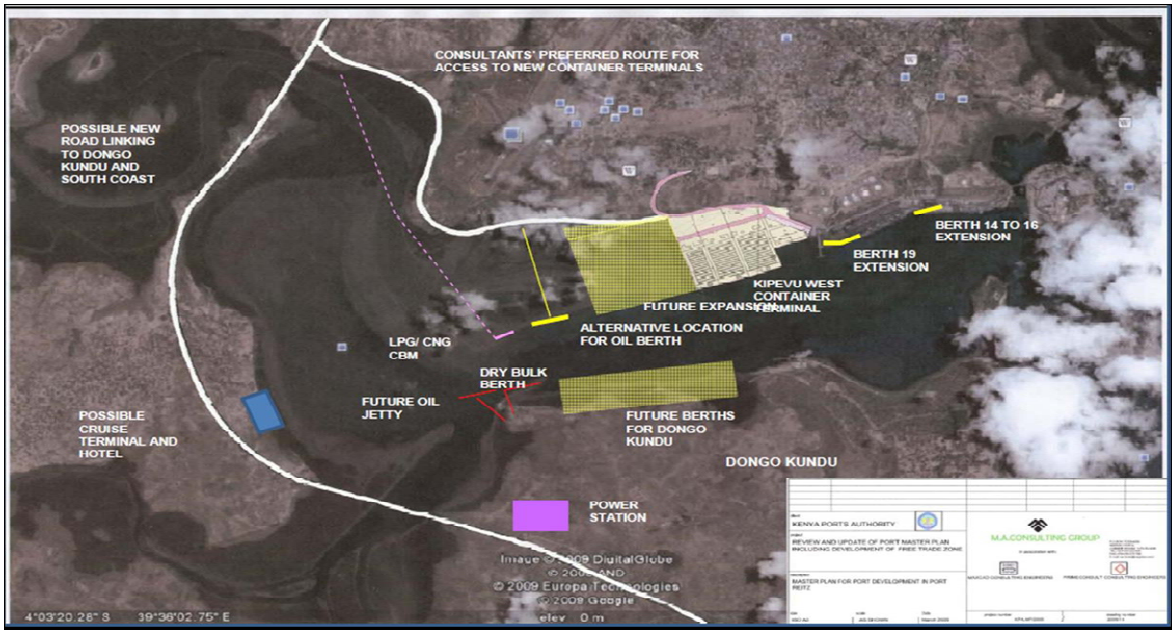
Table 6-1. Proposed Infrastructure Projects for Mombasa Port

Name	Cost (US$ mill.)	Estimated Impact on Port Performance		
		Price	Time	Reliability
Enhanced Container Handling w/Integrated ICDs	35	- 4	- 13	- 23
Mombasa Container Terminal Kipevu West	342	- 3	- 11	- 23
Kipevu Petroleum Terminal	56	- 5	- 12	- 13
Dry Bulk Facilities Development	2	- 3	- 6	- 10
Lamu Port and Corridor	7	n.a.	n.a.	n.a.
Total	442	- 15	- 42	- 69

Source: Prepared by Nathan Associates Inc.

The location of these projects is shown on Figure 6-1 and a general description of each project is presented below.

Figure 6-1. Port of Mombasa – Long term Port Master Plan Proposals



Source: M.A. Consulting Group, Review and Update of Port Master Plan including Development of Free Trade Zone for KPA.

Mombasa Short-term Container Handling Capacity Enhancement with ICDs

The Mombasa container handling terminal (Berths 16 – 18) is operating at full capacity: berth occupancy in 2009 was at around 90 percent as opposed to ideal 70 percent or below. Even with the supplemental container handling capacity at conventional terminal (Berths 11 – 14) the estimated combined port container handling capacity of 600,000 TEU is below the 2009 throughput of around 620,000 TEU. Planned new capacity, in particular new Kipevu terminal, is expected to be available 2014 or 2015, more likely the latter date. Given the continued growth of container traffic, recorded at an average 9 percent during 2005 – 2009 and over 13 percent in 2010, this means that without any other intervention to create additional capacity in

the short-term, there will be severe congestion with disastrous results for the port and trade in three to five years until new terminals or additional capacity is available.

During the last crisis of severe congestion, the off dock ICDs, known in Mombasa/Kenya as CFSs, were engaged in 2007 and have helped decongest the port. In this regard, some of domestic containers are transferred to CFSs and in the process removing some of the activities from the port container yards to create more operating space. The proposal is to build on this experience by formally integrating CFSs into the port system to create much needed additional space, higher productivity and, thus, additional capacity to handle ships and containers.

The proposed off-dock ICDs/CFSs Integration Program comprises:

- Relocating all container processing activities from marine yard to CFSs, thus moving entire ships to CFSs, contracted by shipping lines competitively (based on quality of service and price). Possible exception could be ready to go rail bound boxes;
- Simplifying of transfers between marine yard and CFS, including automation of marine gate and use of high capacity and specially tagged trucks to provide shuttle services; and
- CFSs enhancing facilities and technical competency to handle increased transfers from marine yard and to service clients,

Securing acceptance of the proposal by key players and decision makers especially Government, KPA and KRA. The proposal has been discussed by stakeholders at a roundtable meeting and adjudged beneficial. It is estimated that implementation of the CFS integration program may result in increase of capacity up to 1,350,000 TEU that would be adequate for at least another five to eight years. This would avoid the cost associated with long waiting times of ships, low productivity of expensive berth facilities and equipment as well as surcharges by shipping lines. These benefits far outweigh the additional costs and extra time for transfers to CFSs.

Mombasa New Container Terminal – Kipevu West

As mentioned above, the negative impact on vessel wait time, ship turnaround time at the port, and quay and yard operations require urgent action. Over one quarter of throughput is transit cargo, with 80 percent to Uganda. Construction of a new container terminal is critical to Kenya's economic growth and that of the landlocked countries that Mombasa serves. This will be KPA's first concession for terminal operations. In addition to this project, KPA is extending the existing terminal to Berth 19 (tenders submitted 30 September 2010) and plans to upgrade and convert Berths 11-14 to an additional container facility with a private operator. Therefore this project is within a broader strategy to meet the demand for container handling in the region.

The technical designs for the container terminal are being finished. A loan agreement has been signed with JICA for US$239 million to finance the terminal and related equipment and

access road. Tenders for the dredging were submitted in February 2010. Consideration of legal requirements for a concession are underway.

The site is 100 hectares near the Kipevu Oil Terminal. The construction will be in three phases. The first phase is intended to commence in 2011 and be completed in 2013-2014 and will include the following components:

- The terminal is designed to handle 450,000 TEU in the first year (2013) and, when completed, 1.2 million TEU. The JICA loan will cover construction, ship to shore gantry cranes, rubber tired cranes, an access road and construction and extension of yards,.
- A concessionaire will be recruited to provide handling equipment and operate. JICA will also assist with concessioning plan and selection.
- A related dredging program for the entrance channel (15 m), widening the turning basin and berth (11-15 m) will allow vessels carrying up to 4,600 TEU.
- Extension of rail access to the terminal and buoy and channel markers in the access channel.
- A consultant to advise on the final terms for the concession based on experience with similar terminal concessions worldwide.

The second Kipevu terminal will double container capacity by 2018 to meet the needs projected for the medium-longer term. High performance standards due to appropriate terminal design, experienced operator, optimal handling equipment and state of the art information systems to generate the needed coordination and speed to achieve internationally competitive performance standards at Mombasa.

Mombasa Kipevu Petroleum Terminal

Kipevu Oil Terminal handles crude oil and refined oil products and can accommodate vessels to 85 thousand DWT and up to 198 meters long. In 2008, it was at 78 percent berth occupancy and in 2009 was at 86.5 percent. Vessel delays to berth currently cost the petroleum industry an average of US$100 million annually. The port needs new petroleum capacity urgently. The Shimanzi Oil Terminal, which can accommodate vessels up to 35,000 DWT and 259 meters long, handles chemical and other liquid products. This terminal was operating at 62.5 percent capacity in 2008 and 75 percent in 2009. KPA considers it "tending toward saturation". Therefore the Port of Mombasa has a major problem with liquid bulk products. This affects not only Kenya, but also Uganda, Rwanda and other countries importing petroleum and other liquid bulk through the Port of Mombasa.

An international tender was issued by the National Oil Corporation of Kenya in late 2010 for a technical feasibility study of the construction of an offshore petroleum offloading jetty at Mombasa. EOIs were due December 3, 2010. It can be assumed that a full contract will be issued during 2011.

The project is designed to meet the need for additional liquid bulk capacity through design of a BOT project for a single buoy point or off shore jetty system. The project is valued at US$55 million and will involve the Government of Kenya and the private sector. It will be further defined by the feasibility study.

It will be critical to develop a BOT framework that meets the Kenyan and regional need for petroleum and sufficiently rewards the private sector for participation. Appropriate connections to the Kenyan pipeline are essential to success. Review of the pipeline capacity is also being undertaken. Decisions on the pipeline and estimates of total regional demand will be affected by the development of the petroleum fields in Uganda. The first area is underway and a feasibility study is being conducted for a Ugandan refinery.

Mombasa Dry Bulk Facilities Development

Dry bulk of grains, coal, clinker, fertilizers and others is handled at Berths 1-10 and Mbaraki Wharf. Wheat is handled at Berth 3 at which conveyor belts are connected from the Grain Bulk Handlers Ltd. (GBHL) silos. In 2007, 1.5 million tonnes of fertilizer, clinker and coal in total moved through Mombasa Port in 2007. The total is estimated to increase to 2.38 million by 2013. A power station is being constructed at Dongo Kundu and will need to import 1 million tonnes of coal per annum. This could be handled by a dedicated jetty or a common user bulk facility. It is possible to develop a new dry bulk facility in conjunction with this facility for cost sharing.

KPA rates Mbaraki Wharf as tending to saturation and needing attention. Furthermore, the analysis in the Master Plan indicates that construction of a new berth is necessary, possibly at Dongo Kundu. The proposed improvement of bulk terminal infrastructure includes:

- Building two new bridges that can accommodate articulated trucks entering the wharf;
- Extending the berth by 220 m and deepening to -12.5 to allow larger ships to dock, thereby reducing cost and making the wharf more efficient;
- Extending the berth 220 m, based on projections of demand: Depending on the availability at Berths 1-10, it may be possible to delay this until a new berth can be built at Dongo Kundu.

The master plan suggests that with these developments Berth 1 should continue to be used for RoRo vessels and cruise ships at present; Berth 3 for grain and the conveyor extended to berth 4; Berth 5 for RoRo vessels and general cargo such as steel - it could also be converted to an additional grain terminal; Berths 7, 8 and10 for general cargo, bulk liquids and any dirty bulks' and Berth 9 for soda ash. The main changes are some repaving and taking down some sheds to allow more storage areas.

Implementing the proposed investments will result in more efficient handling of bulk traffic, with cost savings estimated at US$0.11 per tonne. GBHL also estimates, for example, that the

cost of fertilizer could be reduced 25 percent with a good bulk handling system for fertilizer at the port.

Lamu Port and Corridor

The original motivation for the development of a new port at Lamu in the 1970's, was the problem of congestion at Mombasa port, which serves as Kenya's only port for international trade, and which was considered to be approaching its maximum development capacity. Since then, the freight throughput at Mombasa has expanded more than threefold from 6 mtpa to more than 19 mtpa, and further expansion is being pursued.

During 2005/6, the Kenyan government, in discussions with southern Sudan and Ethiopia developed the ROOLA project, which included the following infrastructure components:

- Oil pipeline from Southern Sudan to Lamu
- A high speed standard gauge railway linking Lamu to Juba, with links to Addis Ababa and to Gulu in Uganda
- A super highway network linking Lamu to southern Sudan, Ethiopia, and the existing road network in Kenya and Uganda
- A fiber-optic cable along the main transport routes
- The development of an oil refinery and free port at Lamu.

The ROOLA project has effectively been replaced by the LAPSET project (Lamu Port, Southern Sudan, Ethiopia Transport Corridor), aimed at developing a master plan for the port development, with the study to be completed during 2011. The intention is to fund the project through a PPP process.

Such a grand regional infrastructure project will require one or several major anchor projects in order to motivate the initial financing of the core infrastructure. This is likely to be one or several of the following:

- Oil exports from Southern Sudan, could be of the order of 500,000 bbl/day or +20 mtpa
- Oil exports from Uganda, could be up to 150,000 bbl/day or 7 mtpa
- Future iron ore exports form Mt Kodo in the DRC, up to 50 mtpa in order to justify the cost of a dedicated heavy haul line over 1,600 km
- The development of a new container terminal at Lamu, to serve southern Sudan, Ethiopia, and increased demand from the northern corridor, supplementing Mombasa port – this is viewed as a longer term project, given the current expansion projects at Mombasa

Manda Bay, located close to Lamu town, is considered ideal for the development of a deep sea port, with marine access depth of more than 18 m. However, the Lamu area has been declared

as a world heritage site, and there will be environmental constraints on future development, particularly potentially polluting activities such as oil and bulk minerals exports.

In order to advance development of the project, during 2010, Japan Port Consultants were appointed to carry out a feasibility study, funded by the Kenyan Government, to be completed during 2011.

The initial focus now is on the completion of the feasibility study, including projections of future regional trade and freight flows. Depending on the results of the study, a detailed Environmental Impact Assessment will follow.

There are some potential long term economic benefits of a new port development at Lamu. These include (1) supporting the development of bulk terminals for oil and minerals, which would be difficult to locate at Mombasa; (2) opening up new areas for economic development in the countries concerned; and (3) providing an alternative port serving east Africa to increase competition with a view to improving performance and lower prices.

Lake Ports and Transport

The description of lake transport projects that serve both the Northern and Central corridors is presented in the following chapter on the Central Corridor.

Rail

Six infrastructure projects are proposed for the Northern Corridor rail system with a total cost of US$1.7 billion (Table 6-2). Together these projects are expected to reduce price for transport on the RVR network by 10 percent, time of rail operations by 20 percent and improve the reliability of rail services by 34 percent.

Table 6-2. Proposed Northern Corridor Rail Projects

Name	Cost (US$ mill.)	Estimated Impact on Rail Performance (%)		
		Price	Time	Reliability
RVR Infrastructure Upgrade Years 1-5	400	- 4	- 8	- 14
RVR Locomotive Rehabilitation	20	- 4	- 8	- 14
Reconstruction of the Tororo – Gulu – Pachwach	325	n.a.	n.a.	n.a.
RVR Mombasa Intermodal Yard	20	- 1	- 2	- 3
RVR Kampala ICD Development	10	- 1	- 2	- 3
Total	775	- 10	- 20	- 34

Source: Prepared by Nathan Associates Inc.

A description of each of these proposed rail projects for the Northern Corridor is presented below.

RVR Infrastructure Upgrade - 5 years

The Kenyan and Ugandan railway systems are operated jointly by one concessionaire, Rift Valley Railways (RVR), under two separate concession agreements. The original commercial shareholder and operator was unable to revive the operations of the railway services in the northern corridor, which continued to experience unacceptably high levels of equipment failure and major derailments – traffic volumes remained at low levels. During 2010, a new resourceful commercial shareholder gained control of RVR, with an initial commitment to invest US$290 million in the first phase of revival, with plan to increase traffic levels threefold from the current approximately 1.5 mtpa to 4.5 mtpa.

RVR operates on a meter gauge line with coverage of about 2,735 km in Kenya and approximately 306 km in Uganda – made up as follows-

- 530 km (MSA – NRB) of 95 lb/yard track.
- 920 km (NRB – NRO, NRO – ELD, ELD – MLB, MLB – KLA & NRO – MLO) of 80 lb/yard track.
- 153 km (MLO – KSM) of 60 lb/yard track.
- 1,435 km of 50 lb/yard track on branch lines.

The poor condition of the track has lead to imposition of temporary speed restrictions on many sections across the track, resulting in about twenty major derailments per month and unpredictable transit times.

The agreements relating to the new commercial shareholder in RVR are in place, and the track repair and upgrading program has commenced in both Uganda and Kenya. Initial repair and

upgrading of specific sections of poor track in both Uganda and Kenya, which are the main causes of frequent derailments and restricted operating conditions. The Civil Engineering Five Year plan is phased in three stages.

1. Addressing inherited maintenance deficit.
2. Programmed ongoing track maintenance activities.
3. Planned rehabilitation works for particular sections which require more attention than simple maintenance program.

The critical issue in the track rehabilitation program is a 30 km section between Mombasa and Nairobi where rails are worn beyond permissible wear, with damaged sleepers and missing / damaged fittings and fasteners including ballast deficiency. The estimated cost of repairs in KES 475 million (US$6 million or US$200/km). Similarly, there is critical section in the Jinja region in Uganda, with severe speed restrictions and limited train lengths of ten wagons – the work on this section has commenced.

Reconstruction of the Tororo – Gulu – Pachwach Railway

The northern railway from Tororo in Uganda, through Gulu to Packwach, was completed in 1964, a total distance of about 500 km. Due to several periods of conflict in northern Uganda, and the decline of traffic levels, the line was closed, and all freight traffic diverted to road. The security situation in northern Uganda has improved, and this route now provides the main conduit for international trade with southern Sudan (more than 200,000 tpa through Mombasa in Kenya). In addition, the development of the Uganda oil sector in the region served by the northern railway will require significant imports of equipment and materials, and the possibility of crude oil exports of up to an estimated 7 mtpa by rail. There is also the possibility of future iron ore exports from eastern DRC at Mt Kodo, about 100 km west of Packwach and a distance of about 1,600 km from either Mombasa or a future terminal at Lamu. Future iron ore exports from DRC will have to be based on very large volumes in the region of 30 mtpa to 50 mtpa, in order to very low unit transport costs, and this would require a new heavy haul railway to the port, most likely to standard gauge specifications (considered to be a long term project).

The feasibility study for reopening the railway to Gulu and Packwach has been completed and the RVR railway concession agreement has been expanded to include the northern line. Proposals have also been considered by the Ugandan and south Sudanese governments for upgrading the line from Tororo to Gulu to standard gauge (400 km) and extending the railway from Gulu to Juba in southern Sudan (250 km), to serve as an alternative route to the previously proposed Juba to Lamu standard gauge railway. This is likely to be a long term project, but the reopening of the existing line is considered to be a short term priority.

The project will upgrade approximately 500 km of the existing northern railway from the current 25 kg/m rail to +40 kg/m track, 20 t axle loads, with possible realignment in sections in order to increase operating speeds. This will include strengthening of bridges and culverts,

lengthening of passing loops, and provision for later upgrading to a standard gauge specification (three rail system). RVR is the designated operator. Estimated cost in the region of US$400, depending on the recommendation of the feasibility study. This could be implemented as a phased PPP project.

RVR Locomotive Rehabilitation – 3 years

RVR inherited thirty-nine mainline (Class 93/94) diesel electric locomotives from KRC, which form the core of the mainline fleet. These locomotives are North American GE U26Cs, fitted with 2,600 hp engines. A total of twenty-six were built in 1977 and the remainder in 1987 or later. The bulk of the mainline fleet is therefore thirty-seven years old, but continue to remain serviceable and suitable for rehabilitation and upgrading. In southern Africa, many of the mainline locomotives still in service are more than fifty years old, and continue to be serviceable.

RVR operations have been handicapped by the poor condition of locomotives. Out of the thirty-nine mainline locomotives inherited from KRC, only twenty-five are currently in service with varying degrees of suspect reliability due to a back log of deferred maintenance. This has led to a high rate of locomotive/train failures in transit. Between January 2009 and August 2009, RVR experienced a total of 579 mainline locomotive failures – more than two per day, mostly due to engine failures.

Figure 6-2. RVR Locomotive and Train Set

Daily train targets have been six per day on the Mombasa – Nairobi section, now being revised with a target of nine trains per day, with four trains planned to transport containers. In order to meet this target RVR locomotives have been supplemented by locomotives hired from Magadi Soda Company, which operates their own train of the RVR lines between Magadi and Mombasa.

On the RVR Uganda section between Malaba and Kampala, the mainline locomotives are much smaller, similar to those used on the TRL system in Tanzania, 1,200hp. During the 1980's the Nalukolongo railway workshop near Kampala were equipped and ungraded through a €40 million program by KfW, and it is well qualified to carry out full refurbishment of the Uganda locomotives, subject to financing being available. The longer term objective is to replace the Uganda locomotives with larger units similar to those operated in Kenya, to allow for seamless railway operations.

The locomotive repair program (availability of finance) has been commenced by RVR is both Uganda and Kenya, with the initial objective of rectifying deferred maintenance and recommencing the standard maintenance programs. Repair and upgrading of the existing RVR locomotive fleet in both Kenya and Uganda is essential to achieve availability of more than 90 percent. A major mainline locomotive overhaul is likely to cost more the US$0.5 million per unit. A similar program is being implemented for the wagon fleet.

RVR Kampala ICD Development

The efficiency of the modal transfer points, normally located at the inland rail container depot or terminal (ICD), is critical to the competitiveness of rail. Prior to containerization in the 1970's, and the deregulation of road transport, it was common practice for the railway operators to deliver wagons to the customers sidings for loading and unloading. This is no longer considered operationally viable, because of the resulting low equipment utilization, unless it is a large customer with fixed consignments or dedicated wagons, and who is willing to pay extra for the wagon re-positioning service (for example Mukwano in Kampala for their edible oil imports). The alternative is for the railway operator to have a highly efficient and well equipped container terminal, including customs services, where containers can be transferred between road and rail quickly and at a low cost. It is important for the railway operator to turn the unit train around as quickly as possible. The expansion and upgrading of the Kampala rail ICD is therefore an important part of RVR's marketing strategy. Previously, about eight years ago, it was also proposed to develop an ICD at Port Bell, and the viability of this will depend on how the Lake Victoria container services are operated in future.

The expansion, upgrading and successful operation of the Kampala ICD (rail freight terminal) will directly promote rail services, and should assist in shifting both transit traffic and regional trade from road to rail. The existing yard is to be expanded and upgraded, with new equipment and longer rail sidings. Rail access should be directly from the main line and road access should be directly to the key ring roads and bypasses. Ideally train loading and unloading should be by RMG's, and yard equipment should be reach stackers and/or rubber tired gantries. There should be sufficient space for future major expansion – this is often a short coming of ICDs.

RVR Mombasa Intermodal Yard and Equipment

It is well known that the modal interface between port and the land services of road and rail, is where most time is lost, and significant additional logistics costs are incurred. This is mainly due to issues of documentation and customs clearance, but also because of poor interfaces with both road and rail. The rail facilities at many of the regional container terminals are poor, and the operating procedures have been partially inherited from the pre-containerization period - access via inefficiently operated marshalling yards, where trains are stopped, checked and often broken up or retained. Ideally, the intermodal trains should enter the port directly as a unit, with a detailed manifest of all the containers carried. The rail

sidings at the Mombasa container terminal are 450 m long, capable of handling trains of up to thirty wagons, with loading and unloading by RMGs (rail mounted gantries).

As the mainline track is upgraded, and the use of vacuum brakes is standardized, with increased traffic volumes, trains of up to fifty wagons should be allowed for. Conversion to standard gauge will allow much longer trains, but not yet justified by the traffic volumes. The Mombasa container terminal is far too narrow – about 200 m instead of the recommended 500 m – resulting in terminal congestion and interference between the road and rail services.

With the planned expansion of the existing container terminal with Berth 19, it appears that the existing rail sidings can be lengthened to accommodate longer trains. It is important in any new development or conversion of conventional berths, that utmost attention is given to the positioning and length of sidings, and the equipment specified. Clearly the layout, positioning and equipment selection for the intermodal rail sidings at the planned new terminal at Kipevu West must be determined in close liaison with RVR and KR.

The proposed investment includes the lengthening of the rail sidings at the existing container terminals in conjunction with the extension of Berth 19, the provision of additional RMGs, and additional terminal equipment – reach stackers, rubber tired gantries and port tractor - trailer units. If the intermodal rail service is operated as a block or unit train, with fast loading and unloading times, there should be very little requirement for wagon shunting.

Roads

As described in Chapter 2, an assessment of Northern Corridor road network was carried out by Aurecon for the East African Transport Strategy and Regional Road Sector Development Program conducted for the EAC in 2010. This assessment resulted in the identification of three categories of road improvements:

- **Upgrade Road Capacity** - Immediate remedial action, in terms of proving additional capacity principally by adding lanes (e.g. climbing lanes or extra lane(s) for the whole identified length) is recommended for roads with level of service E and F. Roads with

Figure 6-3. Road Construction Activity

LOS D and C are to be investigated for remedial action later.

- **Rehabilitation of Paved Roads -** is triggered for a paved road once its overall condition has deteriorated beyond the point where preventive and routine maintenance can uphold the pavement at a functional level.
- **Upgrade to Paved Standards** - Gravel roads with traffic volumes in excess of 200 vehicles per day operate under poor riding quality conditions and generate excessive costs to road users as well as escalating routine maintenance costs to the road authorities.

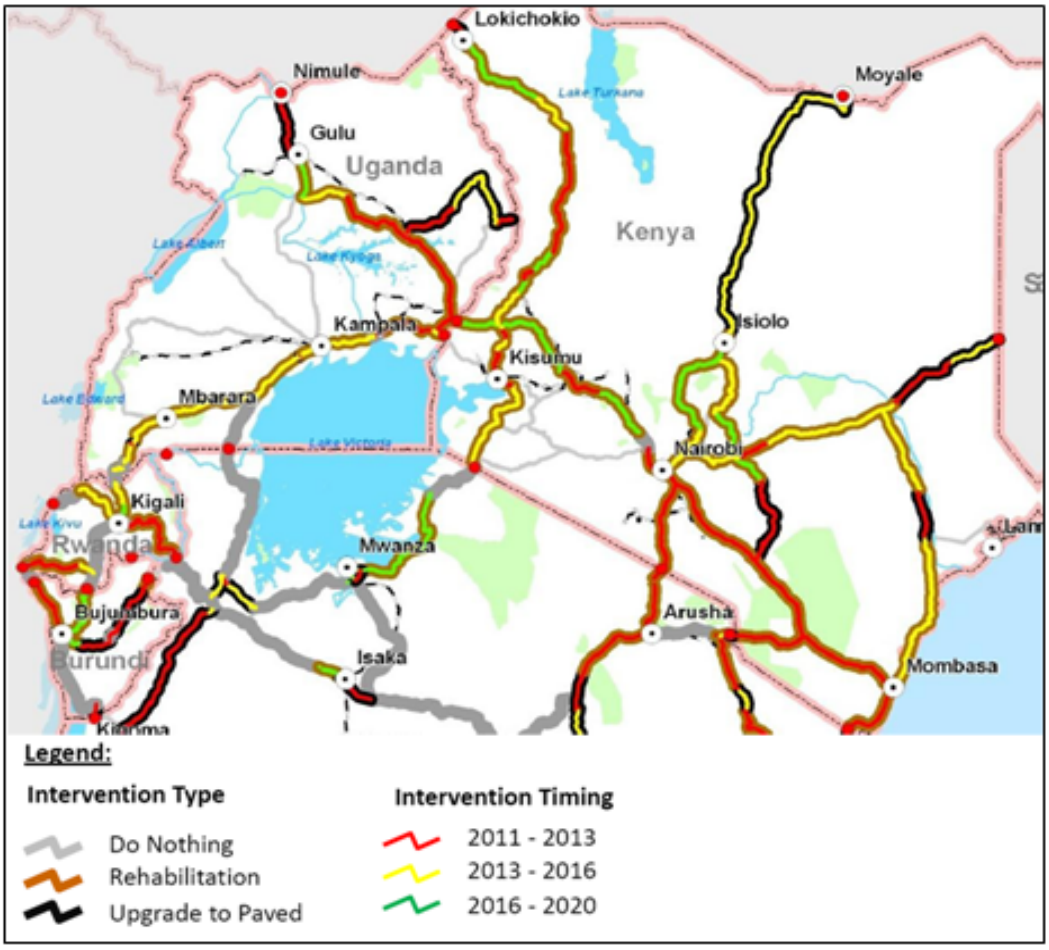
Road improvement projects proposed for Northern Corridor have a total cost of US$ 741 million (Table 6-3). Together these projects are expected to reduce price for shipping on road segments of the Northern Corridor by 17 percent, reduce time by 18 percent and improve the reliability of road transport services by 16 percent. The road projects and their timing are shown in Figure 6-2.

Table 6-3. Proposed Northern Corridor Road Projects

Name	Distance improved (km)	Cost (US$ mill.)	Estimated Impact on Road Performance (%)		
			Price	Time	Reliability
Capacity Upgrades	1,339	234	- 2	- 3	- 6
Road Rehabilitation	864	363	- 10	- 8	- 7
Road Upgrading to Paved	319	143	- 5	- 7	- 3
Total	2,522	741.1	- 17	- 18	- 16

Source: Prepared by Nathan Associates Inc.

Figure 6-4. Northern Corridor Road Interventions by Type and Timing



Source: Aurecon, East African Transport Strategy and Regional Road Sector Development Program, 2010.

Capacity Upgrades

Analysis by Aurecon of road capacities using First Order Network Assessment (FONA) has determined Level of Service (LOS) for the EAC road network, with indices ranging from A (best operating conditions) to F (worst operating conditions). The best operating conditions entail free flow high (design) average speeds and able to overtake easily. Analysis was carried out for base and future (2020) scenarios. Immediate remedial action, in terms of proving additional capacity principally by adding lanes (e.g. climbing lanes or extra lane(s) for the whole identified length) has been recommended for roads with LOS E and F. Roads with LOS D and C are to be investigated for remedial action later, estimated from 2014. The Northern Corridor roads that are shown in Table 6-4 below fall into these categories.

There are already plans to expand capacity of some of roads listed below. However implementation of the comprehensive program of road capacity upgrades as proposed below needs to be pursued expeditiously in order to ensure there is adequate capacity for smooth flow of growing traffic and trade along the roads.

Table 6-4. Proposed Northern Corridor Road Capacity Upgrade Projects

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)
Bujumbura - Kayanza	Burundi	2011	8	1.6
Athi River Sorroundings	Kenya	2011	16	6.5
Eldoret - Bungoma	Kenya	2011	104	14.5
Molo - Eldoret	Kenya	2011	127	17.7
Mombasa - Voi	Kenya	2011	57	9.9
Voi - Kitui Rd Junction	Kenya	2011	135	18.8
Fort Hall - Embu - Isiolo: (Moyale- Dodoma Spur)	Kenya	2011	99	17.3
Fort Hall - Nyeri: (Moyale- Dodoma Spur)	Kenya	2011	40	8.3
Kajiado - Namanga - Arusha: (Moyale- Dodoma Spur)	Kenya	2011	32	6.7
Thika - Garissa: (Fe (Moyale- Dodoma Spur)	Kenya	2011	27	7.6
Bungoma/Eldoret junction - Kakamega: (Lokichogio Spur)	Kenya	2011	41	8.4
Eldoret - Kitale: (Lokichogio Spur)	Kenya	2011	53	9.1
Kakamega - Kisumu: (Lokichogio Spur)	Kenya	2011	49	10.3
Kisii and surroundings: (Lokichogio Spur)	Kenya	2011	166	23.2
Kisumu and surroundings(Lokichogio Spur)	Kenya	2011	46	9.5
Kitale and surroundings (Lokichogio Spur)	Kenya	2011	21	4.3
Kampala - Masaka - Mbarara	Uganda	2011	104	19.1
Kampala & surroundings (50 percentJinja-Kampala):	Uganda	2011	81	14.1
Tororo - Bugiri - Jinja	Uganda	2011	31	6.3
Kakamega - Kitale (Lokichogio spur)	Kenya	2014	42	8.8
Byumba - Kigali	Rwanda	2014	27	5.6
Kakitumba and surroundings	Rwanda	2014	28	5.7
Jinja - and surroundings	Uganda	2014	5	1.2
Total			1,339	234.5

Source: Prepared by Nathan Associates Inc.

Road Rehabilitation Projects

The condition of East Africa Northern and Central Corridors road network was comprehensively assessed in 2010 to determine the level of deterioration of pavement. HDM derived International Road Indices (IRI) were established for all roads, ranging from 0 (good) to 20 (very poor). Paved roads with roughness levels between 2 and 6 IRI were classified to be in considerable sound state requiring no immediate remedial action, but with the assumption that they will receive routine and periodic maintenance in time to maintain conditions so as not to impact on productive capacity of the road.

Paved roads with roughness levels between IRI 6 and 10 were classified to be approaching severe state or "warning state", requiring rehabilitation within next 5 years. Paved roads with roughness levels above 10 IRI were categorized as being in severe condition, requiring immediate rehabilitation. Table 6-5 shows Northern Corridor roads in the latter two categories, with those in severe condition programmed for rehabilitation within the following four years and those in warning condition planned for rehabilitation from 2014.

Table 6-5. Proposed Northern Corridor Road Rehabilitation Projects

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)
Mwanza - Sirari/Kisii: Rehabilitation	Tanzania	2011	239	100.4
Kisumu - Kakamega:(Lokichogio spur)	Kenya	2014	94	39.5
Tororo - Jinja: Rehabilitation	Uganda	2014	151	63.4
Kampala - Kabale: Rehabilitation	Uganda	2014	380	159.6
Total			864	362.9

Source: Prepared by Nathan Associates Inc.

Upgrading to Paved Roads

Road condition assessments conducted by CDS/Nathan Inc, Aurecon and Louis Berger of the East Africa road network has determined that 3,600 km of regional roads are gravel surface on which vehicles operate with huge economic consequences (high cost and consequent lack of facilitation of trade and thus economic growth). In order to reduce the high economic cost there is need to upgrade them, especially those with relatively high traffic levels. Among these are 319 km on the Northern Corridor. Given the level of traffic on the concerned roads, there is need to upgrade them in the medium to long term. Consequently, Table 6-6 lists roads of 319 km on the Northern Corridor that are recommended for upgrade to paved standard from 2014.

There are plans to upgrade some of roads listed below. However implementation of the comprehensive program of road upgrades from gravel to paved standard as proposed below needs to be pursued timely to mitigate the economic cost and unlocking further economic opportunities.

Table 6-6. Proposed Northern Corridor Road Projects
Upgrading to Paved Condition

Component	Country	Invest. Start Year	Dist. (km.)	Cost (US$ million)
Bujumbura -Gitega – Muyinga	Burundi	2011	149	104.3
Nairobi and surroundings	Kenya	2014	56	23.5
Nakuru- Londiani	Kenya	2014	114	15.9
Total			319	143.7

Source: Prepared by Nathan Associates Inc.

7. Proposed Projects for Improving Central Corridor Performance

In this section we present an overview of specific infrastructure projects that have been identified to improve the performance of the Central Corridor in the next five years. The projects are presented by transport mode in the sections below. Projects were selected for the Action Plan based upon the strategies for improving the Northern Corridor performance described in Chapter 5 and their potential to have a significant impact on the corridor's performance in terms of time, cost and reliability. All of the proposed projects are also deemed to have a medium to high economic viability. Detailed project profiles of these proposed infrastructure interventions are presented in Appendix A.

Dar Es Salaam Port

Five infrastructure projects are proposed for the port of Dar es Salaam with a total cost of nearly US$ 634 million (Table 7-1). Together these projects are expected to reduce time on port node by 49 percent, reduce port related prices by 13 percent and improve the reliability of by 37 percent.

Table 7-1. Proposed Projects for Dar es Salaam Port

Name	Cost (US$ mill.)	Estimated Impact on Port Performance (%)		
		Price	Time	Reliability
Enhanced Container Handling w/Integrated ICDs	26	- 2	- 16	- 7
Liquid Bulk Single Point Mooring	69	- 5	- 12	- 13
New Container Terminal (Berth 13-14)	450	- 1	- 15	- 7
Conversion of General Cargo Berths to Dry Bulk	5	- 2	- 4	- 8
Improved Road Access to Port	40	- 1	- 2	- 2
Total	634	- 13	- 49	- 37

Source: Prepared by Nathan Associates Inc.

Figure 7-1. Port of Dar es Salaam Master Plan

Dar es Salaam Short-term Container Handling Capacity Enhancement with ICDs

The Dar es Salaam container handling terminal (Berths 8–11) is operating at full capacity: Berth occupancy in 2009 was at around 90 percent as opposed to ideal 70 percent or below. Even with the supplemental container handling capacity at conventional terminal (Berths 5–7), the estimated combined port container handling capacity of 310,000 TEU is below the 2009 throughput of around 354,000 TEU. Planned new capacity, in particular a new terminal at new Berths 13 - 14, is expected to be available 2014–2015, more likely the latter date. Given the continued growth of container traffic, recorded at an average 13 percent during 2000–2008, this means that without any other intervention to create additional capacity in the short-term, there will be severe congestion with disastrous results for the port and trade in three to five years until new terminal or additional capacity is available.

During the last crisis of severe congestion, the off- dock ICDs were engaged in 2007 and have helped decongest the port. In this regard, some of domestic containers are transferred to ICDs and in the process removing some of the activities from the port container yards to create more operating space. The proposal is to build on this experience by formally integrating ICDs into the port system to create much needed additional space, higher productivity and, thus, additional capacity to handle ships and containers. The proposed ICDs Integration Program comprises:

- Relocating all container processing activities from marine yard to ICDs, thus moving entire ships to ICDs, contracted by shipping lines competitively (based on quality of service and price). Possible exception could be ready to go rail bound boxes;

- Simplifying of transfers between marine yard and ICDs including automation of marine gate and use of high capacity and specially tagged trucks to provide shuttle services; and
- ICDs enhancing facilities and technical competency to handle increased transfers from marine yard and to service clients,

Securing acceptance of the proposal by key players and decision makers, especially government, TPA and TRA. The proposal has been discussed by stakeholders at a roundtable meeting and adjudged beneficial. It is estimated that implementation of the ICDs integration program may result in increase of capacity up to 1,050,000 TEU that would be adequate for at least another eight to ten years. This would avoid the cost associated with long waiting times of ships, low productivity of expensive berth facilities and equipment as well as surcharges by shipping lines: these far outweigh the additional costs and extra time for transfers to ICDs.

Dar es Salaam Container Terminal (Berths 13 &14)

Container traffic is handled at specialized container terminal (berth 8 – 11), concessioned to the Tanzania International Container Services (TICTS), with Hutchinson HP holding majority shares, and at conventional terminal (berths 5 -7). In 2009, the Port of Dar es Salaam handled 373,500 TEUs with a berth occupancy rate of 88.7% as opposed to ideal around 60 - 70%. Between 2000 and 2008, average annual growth rate has been 13.5%, meaning that additional capacity is urgently needed.

In 2008, dwell time reached 28 days, due mainly to congestion, and the port sought to relieve the capacity problems in the port by using ICDs to handle some domestic containers for clearances. This has improved port performance but has not addressed future capacity needs given the high rate of container traffic growth. Consequently, within the recently completed Ports Master Plan (2009) TPA has determined that a new terminal was needed. TPA plans to develop the terminal and tender it to a private operator, preferably in competition with TICTS. A feasibility study was completed in 2010. A consultant to prepare detailed design has been procured and design is ongoing. Negotiations are also ongoing with the Chinese Government to provide financial support.

The new terminal will have a capacity of 600,000 TEU. Once both the existing and new terminals operate at more optimum levels, better port performance is expected. Having two competing terminals should drive the cost and delays down thus benefitting the shipper. The diagnostic study demonstrated that the port constituted the single greatest delay factor on the corridors. It is thus expected that the second terminal will assist to decongest both terminals, thereby reducing the delay factors at the port, beyond the short-term relief expected from implementing the proposed integrated ICD system.

Dar es Salaam Single Point Mooring (SPM)

The original SPM was built in the 1970s to supply crude to refineries in Tanzania and Zambia. After closure of the Tanzanian refinery, it served only Zambia. Zambia consumed 15,300 million barrels of crude in 2009 of which 15,110 million barrels are imported. Its total refining

capacity is 24,000 million barrels. However, there are plans to establish a new modern refinery in Tanzania with new pipelines to Mwanza and Kigoma, Discussions have been carried out with potential international private sector developers. A significant share of Zambia's petroleum is crude oil shipped from the Port of Dar es Salaam via pipeline to the Indeni Petroleum Refinery in Ndola at a considerable savings in cost over importation of finished product by rail or road and reduced theft and accident risk. TAZAMA Pipeline is jointly owned by Zambia (66.7 percent) and Tanzania (33.3 percent). As part of the Tanzania Ports Master Plan, Royal Haskoning reviewed the market for petroleum through the port of Dar es Salaam and found a viable market in nearby countries.

The project consists of construction of the SPM and two subsea pipelines. One will be 28" in diameter for crude oil and one 24" for white product, with a length of 4.5 km and 4 km respectively. The SPM is being constructed southeast of the harbor entrance and will accommodate ships from 40-150 KDWT. The project is based on projections of increased domestic and regional demand for crude and white product to be delivered on the new system. It also assumes the probably redevelopment of a refinery in Dar es Salaam. The project viability will depend on the success in marketing the product regionally based on the reduced price of pipeline as opposed to road and rail transport delivery.

TPA expects the new facility to provide increased revenue in addition to improvement in quality of service, safety, efficiency and the capacity to handle bigger vessels. The Port of Dar es Salaam and particularly the oil terminals are congested with frequent wait times off shore and terminal delays. All these delays increase the cost of delivered fuel. The SPM should eliminate the delay factors for petroleum deliveries to Dar es Salaam and reduce the delays of other vessels using the entrance channel.

Conversion of Selected General Cargo Facilities to Dry Bulk

The port has a rated capacity of 4.1 million dwt dry bulk cargo handled at Berths 1 -7. This is sufficient for the near term, but high estimates put the requirement for 2023 at 4,779 and for 2028 at 6,056. The efficiency of the operation is also a major factor, with delays in ship offloading causing penalty charges which are passed to customers. Dry bulk is generally handled at Berths 5, 6 and 7, but only 7 can handle vessels with drafts exceeding 9.5 m. To cater for future demand it is estimated that grain storage should be increased to 60,000 tonnes from 30,000 at the existing silo. A private organization, the Dar es Salaam Corridor Group, is building a grain facility close to the port, and is designed to be linked to the terminal with conveyors.

General cargo is also increasing although more slowly. It is expected to approximately double from 2013 to 2023, from 655,000 to 1,317,000 tonnes. By 2028, it is estimated to be 1,842 tonnes. Break bulk is currently offloaded at Berths 1-7, depending on vessel draft and berth availability. To accommodate this growth and achieve greater efficiency, it is recommended to deepen Berths 1-4 to allow larger ships and make better use of the existing port.

TPA has begun to implement these recommendations to improve port infrastructure at the bulk terminals. Major components of the projects involved are:

- Creation of a specialized *dry bulk terminal* at Berths 5-7 and dredging to -12 m and the quay strengthened to accommodate heavier cranes and deeper drafted vessels. A conveyor belt is planned to move cement to the packaging area;
- Expansion of the grain silo from 30,000 to 60,000 tonnes to allow handling of larger vessels;
- Strengthening the quay at Berths 1-4 and dredging to a depth of -12 m as well as adding 260 m to the quay length, which is anticipated to meet requirements to handle *break bulk* goods until 2028; and
- Developing a dedicated general cargo facility at Berths 1-4.

Both dry bulk and break bulk are increasing rapidly. The development of dedicated terminals and more efficient handling operations will foster this growth. In both cases, larger vessels are encouraged through greater depth and length of the quay. This will enable faster loading and unloading times and should mean lower costs due to economies of scale and improved productivity.

New Road Access to Dar es Salaam Port

Heavy goods or commercial vehicles destined to or from the port of Dar es Salaam have to drive to heavily congested areas in the city via Bandari Road, Mandela Highway and Morogoro Road/TANZAM Highway. The areas of notable urban traffic extend to between 15 – 20 km from the port. Sometimes during peak hours the heavy duty vehicles are required to park around 15 km away to wait for off peak times. These roads carry traffic to Southern Tanzania and Southern Africa (Zambia, Malawi and DRC/Katanga), Central and Western Tanzania and Central Africa/Great Lakes countries (Burundi, Rwanda, Eastern DRC and Uganda) and Northern Tanzania and Kenya. They all use a common section up to 100 km away (Chalinze) where traffic to the north branches off. The proposal is to develop a highway which bypasses these congested areas from the port to rejoin the TANZAM Highway about 65 km away or more (Mlandizi or beyond). Due to the volume involved, this road is considered a good candidate for a toll road.

Mandela Road is undergoing rehabilitation and slight improvement with grade separated flyovers at critical junctions. There are also plans to further widen Morogoro Road and lengthen the distance with dual carriageway to about 25 km from the port. Some further ring roads are planned, which will take some of the traffic away from Morogoro Road. However, at the rate that traffic is growing around Dar es Salaam and the expected continued vibrant economic growth of the Dar es Salaam port hinterland (Tanzania and neighbors), there is need to prepare adequately by looking for alternative options beyond these roads. Initially a feasibility study should be undertaken to establish the best option.

This project is still at conceptual stage. However, the Development Bank of Southern Africa had in 2008 expressed interest to finance a feasibility study for the road, as part of follow up to Central Development Corridor (CDC) work. The components include (1) - Feasibility study; (2) Transaction Advisory services to structure a PPP, prepare an RFP and assist with procurement of developers; and (3) construction and management of the road.

Rail

As shown in Table 7-2, seven infrastructure projects are proposed for improving the performance of the TRL rail system for Northern Corridor with a total cost of US$ 870 million. Together these projects are expected to reduce price on rail segments of the Northern Corridor by 30 percent, reduce time of rail transport by 15 percent and improve the reliability of rail transport services by 7 percent.

Table 7-2. Proposed Central Corridor Rail Projects

Name	Cost (US$ mill.)	Estimated Impact on Rail Performance		
		Price	Time	Reliability
Procure and Retain TRL Management Team	2	n.a.	n.a	n.a.
TRL Revival – Infrastructure and Equipment	110	- 8	- 3	- 1
TRL Locomotive Repair and Acquisition	30	- 7	- 3	- 1
TRL Wagon Repair and Acquisition	20	- 6	- 3	- 1
Dar es Salaam Cargo Freight Station (Kisarawe)	183	- 2	- 1	0
TRL Track Infrastructure Upgrade 3-5 years	350	- 6	- 3	- 1
TRL Isaka ICD Development	25	- 1	- 2	- 3
Total	870	- 30	- 15	- 7

Source: Prepared by Nathan Associates Inc.

A description of each of these proposed rail projects for the Central Corridor is presented below.

Procure and Retain TRL Management Team

The Tanzania Railway Corporation/Tanzania Railways Limited (TRC / TRL) serves the land locked countries of Uganda, Rwanda, Burundi and south eastern DRC. Traditionally the system carried between 1.2 mtpa and 1.5 mtpa, but in the past six years traffic has fallen to below 0.5 mtpa due to a series of specific events: (i) lack of investment and poor performance of the railways over the period; (ii) the suspension of the Ugandan rail ferry service; (iii) the 2009 flood damage, causing a six month service suspension, and (iv) the failure of the concession with Rites, operating as TRL. The TRL service is particularly critical for Burundi, because it previously carried all Burundi's international trade, which is now routed via a much longer and more expensive road route. The same applies to trade with the eastern DRC through the lake ports of Kigoma and Kalemie. The TRL service also provides the shortest distance to any port from Rwanda, and the decline of the lake and rail service has resulted in

Rwandan transit traffic being shifted from the Central to the Northern corridor, at additional cost. As a result of the failed concession, the budget allocated for the revival of the system is no longer available. Urgent outside assistance is needed

TRL is currently in an interim stage, being managed through RAHCO, with TRL staff salaries being guaranteed by government, but TRL being responsible for all other operating costs. RAHCO has sought financial support through government for a total investment of US$90 million in track repair and upgrades in the first three years. There appears to be no possibility for funding future TRL operations without the preparation of a detailed, realistic and credible business plan, which is focused on core business, linked to increasing freight traffic volumes. At the present time, TRL is unable to serve major new customers without additional up front funding to improve the performance of both infrastructure and equipment.

The first phase of the project will include preparation of the TOR for a management contract, working jointly with MOID and RAHCO, motivation of funding for the management contract (estimated at US$2 million over two years), preparation of tendering process, prequalification, adjudication, preparation of management contract and appointment of management contractor.

In the second phase of the proposed project, the recruited TRL management team will be retained for a period of two years, manage the operation of TRL, prepare detailed business plans, including cash flows and financing schedule, presentation of business plan to secure funding, prepare and implement marketing plan to target intermodal sector and increase freight levels. A study will assess options for future operational structure for TRL and prepare contracts for operating concession. The cost of the management contract that will require institutional funding through government is estimated at US$2 million.

Tanzania Railways Ltd. Revival – Infrastructure and Equipment

The absence of new investment, TRL's declining income and lack of working capital have resulted in deferred maintenance of both track infrastructure and equipment, which has severely restricted operating capacity. TRL is unable to implement a short sustainable revival plan without a substantial capital investment, estimated to be about US$110 million over a two year period. The capital injection will be required to be justified by a detailed business plan to be prepared by a new management team to be appointed. As a result of the failed concession, the original budget allocated for the revival of the system is no longer available.

Government has initiated the process of selecting a new management team for TRL, in order to prepare the necessary business plan to support new funding. The World Bank has indicated its support during the 4th Joint Infrastructure Sector Review in Dar es Salaam, by requesting that the new business plan must be focused on core business only. Some funds have been made available from the WB for consultants and TA support for TRL.

This proposed project provides funding and implementation of a (1) short term capital investment program for TRL and (2) provision of working capital over a two year period, to secure the operational improvement of TRL under a new management team to be appointed. The main components of the investment program will be track repair and upgrading in specified areas, repair and refurbishment of TRL wagons and locomotives, with possible leasing of additional equipment as defined by the approved business plan.

The conditions precedent for the short term capital funding of TRL are (i) that an experienced interim management team is put in place, with full executive powers, and (ii) that a realistic and bankable business plan is developed, plotting clear route to the sustainability of the TRL services, including the future operating structure of TRL.

TRL Locomotive Repair and Acquisition 2 to 3 years

When the TRL concession commenced in 2006, the total diesel electric locomotive fleet numbered eighty-two units of which only sixty-five were considered operational, but most of which suffered from deferred maintenance, which translated into very poor reliability. In addition, TRL has thirty-four smaller diesel hydraulic 'shunting' locomotives, of which twenty-seven were recorded as being active. The core of the mainline locomotive fleet consists of thirty-five Canadian MLW Bombardier locomotives, relatively small locomotives of 1,200 hp, of a similar size to those used by Uganda Railways. MLW in Canada ceased diesel electric locomotive production in 1985 (twenty-five years ago), and were taken over by GE, which closed the plant in 1993. The bulk of the TRL locomotive fleet can be considered to be beyond its economic life, although it has been possible to keep most of the locomotives operational through a process of continuous repair. W When the Government and Rites of India TRL concession commenced operation in 2006, twenty-five used locomotives were imported from India on a lease basis to supplement and replace the MLW units. However the Indian locomotives were not put into service with TRL because of a dispute with the TRL workforce, which considered them to be no better than the existing TRL locomotives. Since then the Rites concession has been cancelled and the twenty-five Indian locomotives are the subject of a payment dispute, and are not being utilized – TRL is unable to increase freight traffic volumes without additional locomotives being put into service. A similar situation exists for the TRL wagon fleet.

The collapse of the te Government and Rites TRL concession has resulted in withdrawal of the capital investment budget, and TRL is therefore unable to fund the locomotive repair and acquisition program. Without a reliable mainline locomotive fleet TRL is unable to provide competitive transport service, or to increase freight volumes – which will be necessary in order to achieve financial and economic viability.

The proposed investment program aims at increasing the TRL operational mainline locomotive fleet in accordance with the requirement of the revival business plan – likely to be not less than thirty locomotives being available at any time. There are several options which can be pursued simultaneously and jointly:

- Repair and upgrading of selected units in the existing MLW fleet. (mainline locomotives in South Africa continue to be upgraded and serviceable beyond the age of fifty years in the case of GM or GE units)
- Purchase of new locomotives, most likely remanufactured units, up to 2,000hp, at a cost of about US$1.5 million each.
- Leasing of locomotives on long term basis, possibly including an agreement on the twenty-five small Indian locomotives already held, alternatively from other regional railway companies such as NRZ in Zimbabwe, modified to 1,000 mm gauge, likely to cost up to US$1,200/day on a full maintenance basis, .

The justification for the funding of the TRL locomotive expansion program will be a realistic business plan which supports the investment in track infrastructure repair and upgrading, improved management and the commitment of existing and new customers to use the TRL rail service. The provision of locomotives and wagons can be arranged through a PPP structure. The provision of a reliable locomotive fleet is essential to the revival and future success of the TRL service, and for it to be increasingly competitive with the alternative road transport services.

TRL Wagon Repair and Acquisition 2 to 3 years INFR-RL-03A

When the TRL concession commenced in 2006, the total wagon fleet numbered 1,847 units, of which 1,245 were considered operational, but many of which were 'outdated' in their function – such as cattle wagons and many of the large covered wagons, suitable for breakbulk only. Almost all the wagons are of the bogie type, having two sets of two 15 t axles, capable of carrying up to 43 t of freight. Many of the wagons also suffer from deferred maintenance, and poor reliability. Typically, it is the bearings, wheels and brakes that require attention. The bulk of the freight wagon fleet should ideally consist mostly of low sided open wagons, which can carry heavy bulk goods and also 'drop in' containers – 2 TEU, and also specialized container wagons and fuel wagons. The current fleet consists of 232 high and low sided open wagons, 84 specialized container wagons, and 145 fuel tanker wagons. Many of the covered wagons, of which number more than 720, could be converted to open wagons or container wagons. It is also a relatively cheap and simple process to convert older plain bearing wagons to more reliable and heavier roller bearing axles – this has been carried out extensively in South Africa, Zimbabwe and Mozambique where some serviceable and operating wagons are more than fifty years old. The configuration of the TRL wagon fleet needs to be updated to reflect the future projected freight profile, as defined by the new 'revival' business plan.

The TRL operational wagon fleet should be configured in accordance with the requirements of the revival business plan. Assuming an initial target of three freight train per day, a seven-day train turnaround, and train lengths of thirty wagons, a fleet of 700 to 800 wagons of the specified types should be available at all times. There are several options which can be pursued simultaneously and jointly:

- Repair, upgrading and modification of existing wagons, and where appropriate, conversion to roller bearing axles, and fitting of dual vacuum and air brakes.
- Purchase of new wagons, mainly container wagons or open bulk wagons, at a cost of about US$50,000 each. Fuel tanker wagons and other special purpose wagons will be more expensive, and should ideally be linked to specific transport contracts.
- Leasing of wagons on long term basis from other regional railway companies such as NRZ in Zimbabwe, modified to 1,000 mm gauge, likely to cost up to US$30/day on a full maintenance basis. Leasing will often promote a higher degree of equipment utilization.
- Encouraging customers to invest in or to supply their own dedicated wagons, to be operated by TRL, in exchange for a discounted rail tariff

The basis of the TRL wagon demand and configuration will be a realistic business plan which supports the investment in track infrastructure repair and upgrading, improved management and the commitment of existing and new customers to use the TRL rail service. The provision of both locomotives and wagons can be arranged through a PPP structure, ideally linked to longer term transport contracts.

Dar es Salaam Cargo Freight Station (Kisarawe)

The Tanzania Ports Authority (TPA) has recognized that the operational efficiency of the port of Dar es Salaam is being adversely affected by both congestion within the port terminals and by road congestion within the city. The implementation of a system of ICDs within the city has provided a solution to the problem of port terminal congestion, with resulting improved terminal efficiency, but the problem of city road congestion remains. In order to further improve the efficiency of the container terminal and to provide much needed additional space, it has been proposed to develop a system of near port ICDs, integrated with the port terminal operations, as an extension to the port. The intention is to transfer all import containers to the integrated ICDs by means of a low cost tractor trailer container shuttle service, except those containers which are specifically booked on rail (mainly transit traffic).

Figure 7-2. Proposed Site for Kisarawe ICD

TPA has proposed to develop a Cargo Freight Station (CFS) in an area called Kisarawe, about 35 km from the port, and to connect this to the port terminals by dedicated railway shuttle service. The proposed CFS is connected directly by road to the Morogoro road (the main transit route) and also provided with direct rail connections to both the TRL and the TAZARA systems. The main function of the CFS is to serve as a road/rail transshipment centre for transit goods, a logistics center to provide freight consolidation, distribution and container stuffing and de-stuffing services, long term storage, car storage etc. A key objective is for the CFS to promote the development of a surrounding industrial zone, for further processing and value adding of exports and imports. Domestic imports will logically be routed through the integrated ICDs, and rail bound transit traffic will bypass both ICDs and the CFSs.

The World Bank has supported the concept of CFS by funding pre-feasibility study, which was completed in December 2010. However, a detailed site selection study has not yet been carried out, and this could be done in conjunction with the issuing of an EOI, in order to test private sector investor and operator interest in the project. The World Bank has readiness plans to support appointment of a transaction advisor for the project.

The development of a remote cargo freight station for Dar es Salaam, including the provision for a surrounding industrial development zone, as PPP project. This will require coordination within TPA on the main functions of both the ICDs and CFS, and planning of the shuttle services. Commitments will be required from TRL and TAZARA for the planned railway connection to the CFS and from Tanroads for the road connection.

The key success factor will be the ability to attract private sector investment for the project. For that reason the investors should also have an influence on the final location of the CFS. Contractual commitments from TRL, TZARA and Tanroads will also be necessary.

TRL Track Infrastructure Upgrade – 3 to 5 years

The current track TRL infrastructure consist of long sections of light 30 lb/yard track, mostly in poor condition. The RAHCO action plan presented to the 4th JISR in September 2010, earmarked 330 km of track due for urgent upgrading, including strengthening of bridges to carry heavier axle loads. The main objective of the medium term TRL infrastructure upgrade is to replace all the 30 lb/yard track with new rails of not less than 40 lb/yard, in order to increase permissible axle loads and the operation of longer trains at higher speeds. Increased volumes will also bring the need for improved signaling systems. The proposals for the construction of a new railway line from Isaka to Rwanda and Burundi, is seen as a longer term development, most likely linked to demand from the mining sector for bulk exports – similarly the proposals for a new standard gauge railway from Dar es Salaam to Isaka. Upgrading of the existing TRL track could in some sections be carried out with provision for future conversion to standard gauge.

Phased upgrading of the TRL track infrastructure and signaling systems to allow more 'modern' and competitive train service to be operated – axle loads for 18-20 tons, longer trains, faster transit and turnaround times, and greater reliability. In the first instance, this will entail the track infrastructure to be upgraded with heavier rails and structures to a uniform standard on all the main lines, commencing with the lines between Dar es Salaam, Mwanza and Kigoma. It is expected that the rail service to Tanga and Arusha will be reopened and upgraded to the same standard

The infrastructure upgrade will further increase reliability and serve as an additional incentive for the development of the nickel mining sector in Burundi and north eastern Tanzania. Track upgrading will also allow the transport of heavy abnormal loads for the mining industry – the cost of road transport of heavy equipment within Tanzania is presently prohibitive.

TRL Isaka ICD Development

Historically, the TRL rail service on the Central Corridor carried virtually all the transit traffic between the port of Dar es Salaam and the land locked countries of Rwanda and Burundi, and also a significant portion of the trade with Uganda and the eastern DRC. There were also block or unit train operations between Dar es Salaam and Isaka. Since the decline of the TRL service over the past seven to eight years, reflected as lack of capacity and unreliability, most of the central corridor transit traffic has moved to road transportation, and in respect of Uganda and Rwanda, there has been a major diversion to the Northern Corridor serving the port of Mombasa. In the case of Rwanda, this has resulted in a longer and more expensive route for international trade, and for transit trade via Dar es Salaam, a much more expensive road service.

The business plan for the planned revival of TRL over the next two years will include a target to recapture the Rwanda transit traffic as a multimodal service – by rail between Dar es Salaam and Isaka, about 900 km, and by road between Isaka and Kigali, about 300 km. This

will require road / rail transshipment to be carried out at Isaka, and it was previously planned to have a fully equipped ICD to deal with this, but implementation has been delayed because of the decline in the rail service and the lack of financing. The transshipment facility at Isaka will be the weakest point in the multimodal service, where most of the time could be lost, if the facility is not adequately equipped and managed, and also fully coordinated with the rail service. The development of the Isaka ICD should be promoted by TRL as a railway services marketing drive, to serve Rwanda and north eastern region of Tanzania, including the rapidly developing mining sector, as well as parts of Eastern DRC close to Rwanda.

TRL is in an interim phase with no ability to finance new projects until a new management team has developed a new business plan to support new investment. A fully equipped ICD at Isaka is likely to be an important element of the TRL business plan, whether or not it is directly finance and operated by TRL. This could be developed by the private sector, but subject to performance commitments from TRL

The construction of a new ICD, capable of handling full TRL unit trains of about thirty wagons in the initial phases, ideally with loading and unloading of containers by RMGs, alternatively forklifts in the first phase, provision of large paved container storage areas, equipped with reach stacker(s), truck parking and access, fueling points (service station), administration block, telecommunications, possible ware housing and accommodation with cargo distribution and consolidation services. Initial requirement about 10 ha, phased development (could be similar to the small Kidatu ICD which links the TRL and TAZARA railways, which was fully equipped, also with ware housing, and a reach stacker)

Roads

As described in Chapter 3, an assessment of Central Corridor road network was carried out by Aurecon for the East African Transport Strategy and Regional Road Sector Development Program conducted for the EAC in 2010. This assessment resulted in the identification of three categories of road improvements:

- **Upgrade Road Capacity** - Immediate remedial action, in terms of proving additional capacity principally by adding lanes (e.g. climbing lanes or extra lane(s) for the whole identified length) is recommended for roads with level of service E and F. Roads with LOS D and C are to be investigated for remedial action later.
- **Rehabiltation of Paved Roads -** is triggered for a paved road once its overall condition has deteriorated beyond the point where preventive and routine maintenance can uphold the pavement at a functional level.
- **Upgrade to Paved Standards** - Gravel roads with traffic volumes in excess of 200 vehicles per day operate under poor riding quality conditions and generate excessive costs to road users as well as escalating routine maintenance costs to the road authorities.

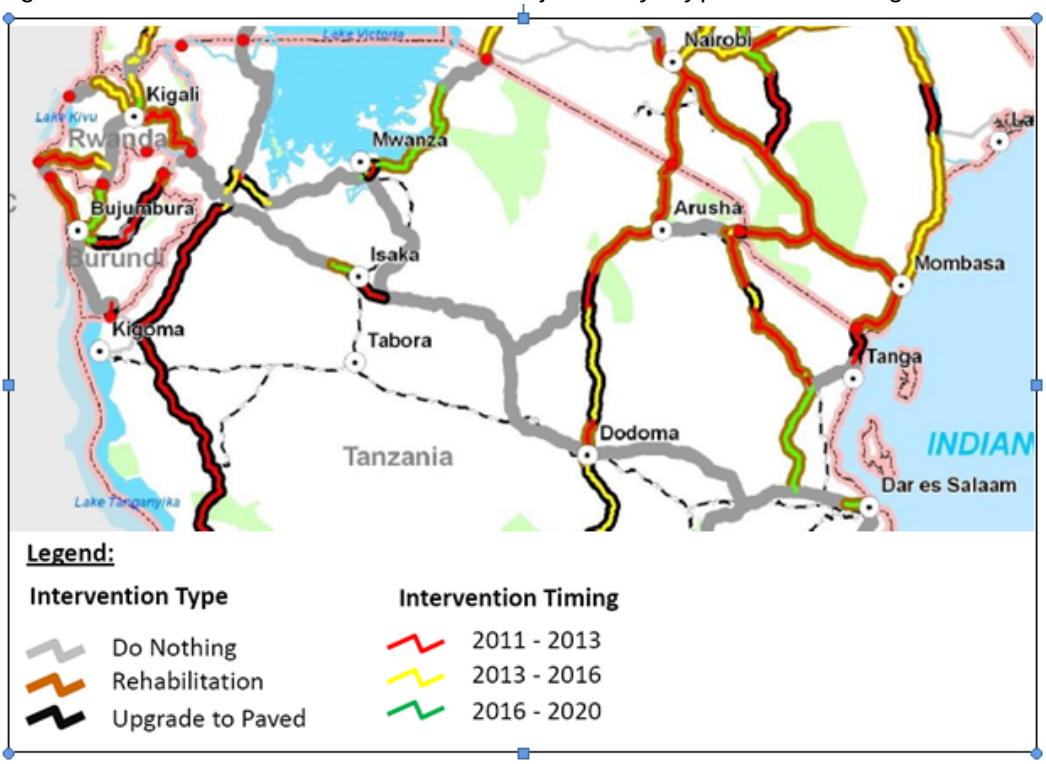
Three different types of infrastructure projects are proposed for improving the performance of the road transport system for Northern Corridor with a total cost of US$ 1.7 million (Table 7-3). Together these projects are expected to reduce price on road segments of the Northern Corridor by 6 percent, reduce time of road transport by 11 percent and improve the reliability of road transport services by 4 percent.

Table 7-3. Proposed Central Corridor Road Projects

Name	Distance Improved (km)	Cost (US$ mill.)	Estimated Impact on Road Performance (%)		
			Price	Time	Reliability
Capacity Upgrades	189	61.7	- 1	- 2	- 2
Road Rehabilitation	732	331.0	- 2	- 3	- 1
Road Upgrading to Paved	774	543.8	- 3	- 6	- 1
Total	1,695	936.5	- 6	- 11	- 4

Source: Prepared by Nathan Associates Inc.

Figure 7-3. Central Corridor Road Projects by Type and Timing



Source: Aurecon, East African Transport Strategy and Regional Road Sector Development Program, 2010.

Capacity Upgrades

Analysis by Aurecon of road capacities using First Order Network Assessment (FONA) has determined Level of Service (LOS) for the EAC road network, with indices ranging from A (for best operating conditions) to F (for worst operating conditions). The best operating conditions entail free flow high (design) average speeds and able to overtake easily. Analysis was carried out for base and future (2020) scenarios. Immediate remedial action, in terms of proving additional capacity principally by adding lanes (e.g., climbing lanes or extra lane(s) for the whole identified length) has been recommended for roads with LOS E and F. Roads with LOS D and C are to be investigated for remedial action later, estimated from 2014. The Central Corridor roads that are shown in Table 5-4 below fall into these categories.

There are already plans to expand capacity of some of roads listed below. However implementation of the comprehensive program of road capacity upgrades as proposed below needs to be pursued expeditiously in order to ensure there is adequate capacity for smooth flow of growing traffic and trade along the roads.

Table 7-4. Proposed Central Corridor Road Capacity Upgrade Projects

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)
Bujumbura – Gitega	Burundi	2011	6	1.1
Kibungo - Kigali	Rwanda	2014	32	6.7
Dar es Salaam - Mbezi	Tanzania	2014	25	5.1
Dar es Salaam port access bypass (to Mlandizi) New constr.	Tanzania	2014	75	40.0
Dodoma - Arusha (Dodoma feeder)	Tanzania	2014	51	8.8
Total			189	61.7

Source: Prepared by Nathan Associates Inc.

Road Rehabilitation Projects

The condition of East Africa Northern and Central Corridors road network was comprehensively assessed in 2010 to determine the level of deterioration of pavement. HDM derived International Road Indices (IRI) were established for all roads, ranging from 0 (good) to 20 (very poor).

Paved roads with roughness levels between 2 and 6 IRI were classified to be in considerable sound state requiring no immediate remedial action, but with the assumption that they will receive routine and periodic maintenance in time to maintain conditions so as not to impact on productive capacity of the road.

Paved roads with roughness levels between IRI 6 and 10 were classified to be approaching severe state or "warning state", requiring rehabilitation within next 5 years. Paved roads with roughness levels above 10 IRI were categorized as being in severe condition, requiring immediate rehabilitation. Table 7-5 shows Central Corridor roads in the latter two categories,

with those in severe condition programmed for rehabilitation within the following four years and those in warning condition planned for rehabilitation from 2014.

There are already plans to rehabilitate some of roads listed below. However implementation of the comprehensive program of road capacity upgrades as proposed below needs to be pursued expeditiously in order to secure road conditions that will facilitate smooth flow of growing traffic and trade along the corridors.

Table 7-5. Proposed Central Corridor Road Rehabilitation Projects

Component	Country	Invest. Start Year	Dist. (km.)	Cost (US$ million)
Bubanza - Cyangugu/Bukavu	Burundi	2011	77	32.3
Muyinga – Kanazi	Burundi	2011	27	18.9
Kigali - Ruhengeri	Rwanda	2014	98	41.2
Nyamahale - Kigali	Rwanda	2014	154	64.7
Dar es Salaam and surroundings	Tanzania	2014	28	19.6
Isaka and surroundings	Tanzania	2014	29	20.3
Chalinze – Tanga (Coastal feeder)	Tanzania	2014	170	71.4
Butare - Cyangugu/Bukavu	Rwanda	2014	149	62.6
Total			732	331.0

Source: Prepared by Nathan Associates Inc.

Upgrading to Paved Roads

Raod assessments conducted by CDS/Nathan Inc, Aurecon and Louis Berger of the East Africa road network has determined that 3,600 km of regional roads are gravel surface on which vehicles operate with huge economic consequences (high cost and consequent lack of facilitation of trade and thus economic growth). In order to reduce the high economic cost there is need to upgrade them, especially those with relatively high traffic levels. Among these are 774 km on the Central Corridor. Given the level of traffic on the concerned roads, there is need to upgrade them in the medium to long term. Consequently, Table 7-6 below lists roads of 774 km on the Central Corridor that are recommended for upgrade to paved standard from 2014.

There are plans to upgrade some of roads listed below. However implementation of the comprehensive program of road upgrades from gravel to paved standard as proposed below needs to be pursued timely to mitigate the economic cost and unlocking further economic opportunities.

Table 7-6. Proposed Central Corridor Road Projects Upgrading to Paved Condition

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)
Mwanza and surroundings	Tanzania	2014	14	11.8
Biharamulo and surroundings	Tanzania	2014	67	46.9
Bujumbura – Gitega - Muyinga	Burundi	2014	149	104.3
Nyakanazi - Biharamulo	Tanzania	2014	72	50.4
Nzega - Isaka	Tanzania	2014	55	38.5
Dodoma – Kalema (Dodoma feeder)	Tanzania	2014	167	116.9
Iringa - Dodoma (Dodoma feeder)	Tanzania	2014	182	127.4
Kalema - Arusha (Dodoma feeder)	Tanzania	2014	68	47.6
Total			774	543.8

Source: Prepared by Nathan Associates Inc.

Lake Ports

As shown in Table 7-7, three infrastructure projects are proposed for lake ports and transport in the Northern and Central Corridors with a total cost of US$ 39 million (Table 7-3). Together these projects are expected to reduce price on lake segments of the Northern Corridor by 7 percent, reduce time of lake transport by 3 percent and improve the reliability of lake transport services by 6 percent.

Table 7-7. Proposed Lake Transport Projects

Name	Cost (US$ mill.)	Estimated Impact on Lake Transport Performance (%)		
		Price	Cost	Reliability
Lake Ports Rehabilitation, Dredging and Siltation Protection	14	- 4	- 2	- 3
Establish RoRo Services on Lakes Tanganyika and Victoria	15	- 2	- 1	- 2
Restructure Wagon Ferries to Carry MAFI Trailers	7.0	- 1	0	- 1
Total	39	- 7	- 3	- 6

Source: Prepared by Nathan Associates Inc.

A description of each of these proposed lake transport projects for the Northern and Central Corridors is presented below.

Lake Ports Rehabilitation, Dredging and Siltation Protection

Inland waterways on Lake Tanganyika have historically played an important role in proving least cost, most efficient and reliable means of transport for goods to/from Burundi, Eastern DRC and western Tanzania, as an important component of an intermodal supply chain along the Central Corridor linking these countries to Dar es Salaam port through Kigoma. Similarly inland waterways on Lake Victoria provided an important link for the Central and Northern

Corridor transport intermodal system links to especially Uganda. In this way the Lake provided Uganda with an alternative access route to the sea.

This importance has declined due mainly to backlog maintenance or lack of investments in the ports and marine infrastructure. Insecurity on Lake Tanganyika and the decline in performance of rail links to Kigoma, Mwanza and Kisumu has also denied the lake services with traffic that would have motivated such investment. Many ports are severely silted, with depths at berths reduced to around 3–4m. Port facilities have also deteriorated. However, with better prospects of economic growth in the region, it is important that these links are revived and strengthened. Investment in rehabilitating and improving Lake ports infrastructure and shipping services will be beneficial to the region.

Since traffic is low and needs to develop, it is proposed that initially a relatively cheaper tug and barge based roll on roll off (RoRo) system should be developed on both lakes to provide necessary capacity until cargo traffic builds up to justify more expensive lift on lift off system.

Dredging at some ports on Lake Tanganyika and Victoria has been done or is ongoing, with own funding (TPA) and assistance from Belgium. There are two major initiatives one each for the Lake Victoria and Lake Tanganyika that are ongoing and have established comprehensive investment strategies. In this an investment conference for Lake Victoria was held in Mwanza on mobilizing finance for implementation. The proposed project will:

- Complete or initiate dredging of ports of especially Kigoma, Bujumbura, Kalemie, Mwanza, Port Bell, and Kisumu to restore design depths of generally around 6 m on approach to, in anchorage and along berths.
- Establish a watercourse management system to minimize soil erosion and sedimentation at ports.
- Rehabilitate or establishing areas and ramps to accommodate vehicles (in particular MAFI trailers and forklifts) involved with RoRo operations at ports.

The project will provide the potential to reduce transport/trade cost with the use of least cost links for especially for Burundi, part of Eastern DRC and Uganda. It will also provide viable alternative trade routes for countries using the lake services to avoid propensity to exploit monopoly situations,

Establish RoRo Services on Lakes Tanganyika and Victoria

In the course of revival of inland waterway services on Lakes Tanganyika and Victoria to service increasing volume of cargo, it has been proposed to initially adopt a tug and barge based RoRo services. These would be quicker and relatively less costly to establish. Typically a tug and barge system also requires about a third of the crew compared to a self propelled vessel. Furthermore, barges can be built at low technology shipyards on the lakes, tugs can be bought and railed to the lakes, MAFI trailers can be assembled and fabricated locally and fork- lifts can be bought from local franchises.

There are some private sector operated barges on both lakes. Barges can be built at existing shipyards at some ports on both lakes, albeit with some slight improvement if need be. The project will aim to mobilize private sector, especially those involved in provision of lake services to buy into and establishing RoRo services and acquire barges fabricated at local shipyards. Private lake transport service providers will also be encouraged to purchase MAFI trailers fabricated locally and importation of tugs.

Restructure Wagon Ferries to Carry MAFI Trailers

Principal cargo transport services on Lake Victoria were designed as part of a railway system, with wagon ferries carrying wagons across the Lake. Link spans were built at all major ports Mwanza, Kemondo Bay and Musoma in Tanzania, Kisumu in Kenya and Jinja and Port Bell in Uganda to facilitate rolling wagons on/off the ferries. When the railways were performing well the wagon ferries had an important role to provide an important transport link for both Northern and Central corridors. However, with the near collapse of the railways in recent years the importance and use of wagon ferries declined and the ferries got no proper maintenance.

Out of the five ferries commissioned between 1964 and 1979 only four are serviceable or operational since the sinking of one (Ugandan) in 2005 after collision with a sister ferry. Two (Tanzanian and Kenyan) are operational and the remaining two (Ugandan) are being rehabilitated to be put back to service. This RoRo service is simple to operate and available to use, though some facilities at ports need rehabilitation. However, there is need to reduce the high cost of maintenance and operations of the ferries relative to their carrying capacity. They now carry 19 wagons (38 TEU), A 2009 analysis by Marine Logistics Limited for the Central Development Corridor determined the possibility of the ferries accommodating 62 TEU, an additional 24 TEU on MAFI trailers and on deck, without changing the structure of the vessel. There is a possibility to further improve this capacity by adjusting the superstructure to make the ferry more flexible, with ability to carry a full load of MAFI trailers when there are wagons to ferry. In addition the MAFI trailers have a tare weight of around 5 tons compared to 17 tons for the wagons.

Figure 7-4. Wagon-Ferry Ramp at Port Bell

There are no known existing plans to convert the wagon ferries. The project will include the conduct of a technical feasibility analysis of the conversion, especially related to stability and safety standards; and if found feasible, provide support for carrying out the conversions at local shipyards.

8. Summary and Impact

In this section we present a summary of the infrastructure and operational projects included in the Draft Action Plan, their funding requirements and potential for financing through PPP arrangements. We then show the impact that implementation of the proposed projects would have on corridor performance and the potential for further increase in trade as a result of the improved corridor efficiency.

Draft Action Plan Projects

The 30 transport infrastructure projects proposed included in the Draft Action Plan are presented by mode in Table 8-1. These projects, which are to be implemented within the next five years, have a total cost of US$ 4.3 billion. It is anticipated that 33 of the 40 projects could be implemented under a PPP arrangement with varying degrees of private sector participation. Of the 30 infrastructure projects, 17 projects are in the Central Corridor and have a total cost of US$ 1.8 billion. There are 13 proposed projects for the Northern Corridor with a total cost of US$ 2.5 billion.

There are 11 proposed infrastructure projects for the rail sector with a total capital cost of US$ 1.5 billion. Eight of the proposed rail infrastructure projects are suitable for PPP financing. The three that are not are for the short-term revival of TRL that is anticipated to require public sector and donor financing in the next two years. After that, proposed investments for TRL could be provided under a PPP arrangement.

The six proposed road infrastructure projects have a total capital cost of US$ 1.7 billion of which US$ 0.9 billion are for the Central Corridor and US$ 0.8 billion for the Northern Corridor. Except for a few specific road segments in urban areas or on the Corridor trunk roads with the highest traffic, these projects are not considered as likely candidates for PPP financing.

Table 8-1 Proposed Infrastructure Projects by Mode

Name	Cost (US$ mil.)	Corridor	PPP Potential
Port Projects			
Mombasa Enhanced Container Handling with Integrated ICDs	35.0	NC	Yes
Dar es Salaam Enhanced Container Handling with Integrated	26.0	CC	Yes
Mombasa Container Terminal-Kipevu West	342.5	NC	Yes
Dar es Salaam Container Terminal (Berth 13 &14)	500.0	CC	Yes
New Road Access to Dar es Salaam Port	40.0	CC	Yes
Mombasa Kipevu Petroleum Terminal	55.8	CC	Yes
Mombasa Port Dry Bulk Facilities	1.7	NC	No
Conversion General Cargo to Bulk Terminal, Dar es Salaam	5.0	CC	Yes
Dar es Salaam Single Point Mooring	68.5	CC	Yes
Lamu Corridor New Port and Associated Infrastructure	7.0	NC	Yes
Subtotal	1,074.5		
Rail Projects			
TRL Revival Infrastructure and Equipment	110.0	CC	No
TRL Locomotive Repair and Acquisition 2- 3 years	30.0	CC	No
TRL Wagon Repair and Acquisition 2- 3 years	20.0	CC	No
RVR Infrastructure Upgrade - 5 years	400.0	NC	Yes
RVR Locomotive Rehab – 3 years	20.0	NC	Yes
RVR Mombasa Intermodal Yard	20.0	NC	Yes
RVR Kampala ICD Development	10.0	NC	Yes
Dar es Salaam Cargo Freight Station (Kisarawe)	183.0	CC	Yes
TRL Track Infrastructure Upgrade 3-5 years	350.0	CC	Yes
TRL Isaka ICD Development	25.0	CC	Yes
Reconstruction of Tororo-Gulu- Pachwach Railway	325.0	NC	Yes
Subtotal	1,493.0		
Road Projects			
Central Corridor Capacity Upgrades	61.7	CC	No
Central Corridor Road Rehabilitation	331.0	CC	No
Central Corridor Upgrade to Paved	543.8	NC	No
Northern Corridor Capacity Upgrades	234.5	NC	No
Northern Corridor Road Rehabilitation	362.9	NC	No
Northern Corridor Upgrade to Paved	143.7	NC	No
Subtotal	1,677.6		
Lake Transport Projects			
Lake Ports Rehabilitation, Dredging and Siltation Protection	14.0	CC	Yes
Establish RoRo Services on Lakes Tanganyika and Victoria	15.4	CC	Yes
Restructure Wagon Ferries to Carry MAFI Trailers	7.0	CC	Yes
Subtotal	36.4		
Total All Infrastructure Projects	4,281.5		

Source Prepared by Nathan Associates Inc.

There are 10 port infrastructure project proposed with a total investment of US$ 1.1 billion. Two of the projects, the new container terminals in Dar es Salaam and Mombasa account for more than three-quarters of the proposed port sector investment. With the exception of several small dry bulk projects, all of the proposed port infrastructure improvements can be financed with a high-level of private sector participation.

The three infrastructure projects proposed for lake transport have a total investment of US$ 36 million and can be implemented under a PPP arrangement.

Proposed operational projects are presented by sector in Table 8-2. The 14 proposed projects have a total cost of US$ 17.9 million of all which would require public sector or donor funding. Seven of the projects are categorized as transit facilitation interventions, whereas the road, rail and lake transport sector each have two operational projects proposed. There is one operational project proposed for the port sector

Table 8-2. Proposed Operations Projects by Sector

Name	Sector	Cost (US$ mil.)
Improved Vehicle Overload Control System	Road	0.9
Integration of National & Regional Transport Policies	Road	1.1
Procure and Retain TRL Management Team	Rail	2.0
Establish a Regional Railway Safety Regulator	Rail	1.1
Develop Vessel Maintenance Capacity on Lake Tanganyika	Lake	2.0
Enhance Safe Navigation	Lake	3.0
Enhancing Port Operations with ICT Applications	Ports	2.5
Liberalize Transit Requirements	Transit	0.4
Maximize Customs Union Implementation Benefits	Transit	0.2
Streamline Customs Border Clearances	Transit	0.9
OSBP Implementation	Transit	1.5
Reduce Informal Payments	Transit	0.9
Leadership by NCTTCA and CCTTFA	Transit	0.6
Implement an Effective Transit Regime	Transit	0.9
Total All Operations Projects		17.9

Source Prepared by Nathan Associates Inc.

Impact of Draft Action Plan Projects

The implementation of the proposed Draft Action Plan projects will have a substantial impact on the performance of the Northern Corridor and Central Corridors. The improvement in performance is presented in this section in terms of price, time and reliability for light container imports and exports which are considered indicative of the performance experienced by other cargo types.

NORTHERN CORRIDOR

Table 8-3 presents the estimated improvement in Northern Corridor performance to selected destinations of light container imports. Generally, the price to serve Northern Corridor destination by road decrease by 25 percent and those destination served by rail by 11-14 percent. In terms of time, the destinations served by rail enjoy a reduction of 36 percent in shipment time, while destinations served by road have a reduction in time ranging from 21-33 percent.

The proposed road projects are concentrated on the Northern Corridor (and not on its feeder roads) and are expected to reduce significantly price and time as well as the variation in time (reliability). The higher savings on road transport are due to the implementation of projects that increase the road capacity and rehabilitate the road surface which reduce congestion and vehicle operating costs.

The proposed rail rehabilitation projects, as indicated by RVR representatives, are expected to mainly have an impact on time and its variation. The projects are expected to concentrate in the reduction of derailments (improve safety) and improve reliability of locomotives. The impact of port improvements on road and rail alternatives is also important, although its impact is greater when considering the time due to its larger share of it (with port accounting for about 70 percent of the total time).

The proposed port projects (integrated ICDs, new port terminal, etc.) are expected to reduce the port costs by 24%percent and more importantly reduce port time by 39 percent. The proposed projects have an even greater impact on reliability with gains in reliability of more than 60 percent. This significant improvement in the overall reliability of the road and rail transport is the result of the reduction in variations of time caused by congestion and potential accidents on the road and the improvement of rail operations and reductions in the number of derailments and locomotive breakdowns.

Table 8-3. Improvement in Northern Corridor Performance for Imports with Proposed Action Plan Projects, 2015 (light containers)

Destination	Distance (km.)	Containers (TEU)								
		Price (US$)			Time (Hours)			Reliability Indicator (%)		
		2010	2015	Var. %	2010	2015	Var. %	2010	2015	Var. %
Kampala (road)	1,180	2,099	1,563	-26	323	216	-33	194	61	-69
Kigali (road)	1,661	3,901	2,918	-25	376	262	-30	167	53	-68
Bujumbura (road)	1,903	4,950	3,820	-23	411	297	-28	153	50	-67
Nimule (road)	1,526	5,383	4,276	-21	381	280	-27	165	52	-68
Kasindi (road)	1,623	4,825	3,671	-24	372	259	-30	168	51	-70
Goma (road)	1,811	4,822	3,634	-25	537	422	-21	131	83	-37
Nairobi (road)	480	1,396	1,139	-18	396	308	-22	158	45	-72
Kampala (rail)	1,200	2,059	1,827	-11	462	295	-36	138	46	-67
Nairobi (rail)	489	935	801	-14	316	198	-37	202	68	-66
Port Node*										
Mombasa		297	227	-24	217	133	-39	287	94	-67

Note: Port values are included in the total shown for each destination.

Source: Nathan Associates Inc.

Table 8-4 presents the improvement in performance for Northern Corridor exports of light containers. The changes in terms of reduction in price are similar to those described above for imports. In terms of time, the percent reduction for exports is slightly higher than those estimated for imports. Gains in reliability are substantial and average around a 64 percent improvement in reliability.

Table 8-4. Improvement in Northern Corridor Performance for Exports with Proposed Action Plan Projects, 2015 (light containers)

Origin	Distance (km.)	Containers (TEU)								
		Price (US$)			Time (hours)			Reliability Indicator (%)		
		2010	2015	Var. %	2010	2015	Var. %	2010	2015	Var. %
Kampala (road)	1,180	2,062	1,535	-26	395	255	-35	267	94	-65
Kigali (road)	1,661	3,864	2,890	-25	422	273	-35	250	87	-65
Bujumbura (road)	1,903	4,913	3,792	-23	433	285	-34	244	84	-66
Nimule (road)	1,526	5,346	4,248	-21	431	297	-31	245	82	-67
Kasindi (road)	1,623	5,491	4,003	-27	436	290	-33	242	82	-66
Goma (road)	1,811	4,585	3,606	-25	429	281	-34	246	85	-65
Nairobi (road)	480	971	720	-26	324	203	-37	326	117	-64
Kampala (rail)	1,200	2,022	1,801	-11	558	357	-36	191	69	-64
Nairobi (rail)	489	890	767	-14	412	261	-37	258	93	-64
Port Node*										
Mombasa		260	199	-23	313	196	-37	336	121	-64

Note: Port values are included in the total shown for each origin.

Source: Nathan Associates Inc.

CENTRAL CORRIDOR

Table 8-5 presents the estimated improvement in Northern Corridor performance to selected destinations of light container imports. The reduction in price for destinations served by road are generally between 9-18 percent, while destinations served by rail or rail/ lake are estimated to have reduction in price of 47 to 60 percent. The percent reduction in time is generally in the range of 40-50 percent.

The proposed road projects on the Central Corridor are distributed between the main corridor and its feeder roads and are expected to have a modest impact on price, time and variation in time (reliability), mainly because the main spine of the network is relatively new, having been upgraded or improved in recent years. The savings on road transport are due to the implementation of projects that increase the road capacity and rehabilitate the road surface which reduce congestion and vehicle operating costs.

The proposed rail rehabilitation projects for TRL are expected to mainly have an impact on time and its variation. The projects are expected to concentrate in the reduction of derailments (improve safety) and improve reliability of locomotives, as is being done by RVR on the Northern Corridor.

The impact of port improvements on road and rail alternatives is also important, although its impact is greater when considering the time due to its larger share of it (with port accounting

for about 70 percent of the total time). The proposed port projects (integrated ICDs, new port terminal, etc.) are expected to reduce the port costs by 38% and more importantly reduce port time by 57 percent.

Table 8-5. Improvement in Central Corridor Performance for Imports with Proposed Action Plan Projects, 2015 (light Containers)

Destination	Distance (km.)	Containers (TEU)								
		Price (US$)			Time (Hours)			Reliability Indicator (%)		
		2010	2015	Var. %	2010	2015	Var. %	2010	2015	Var. %
Mwanza (via road)	1,129	1,618	1,446	-11	362	190	-48	198	163	-18
Goma (via road)	1,640	3,618	2,980	-18	565	233	-59	135	134	-1
Kigali (via road)	1,495	3,314	3,291	-1	420	350	-17	171	106	-38
Bujumbura (via road)	1,567	4,369	3,964	-9	440	253	-43	163	123	-25
Kampala (via rail/lake)	1,568	2,507	1,320	-47	530	305	-42	150	117	-22
Mwanza (via rail)	1,229	1,794	715	-60	411	187	-55	192	182	-5
Bujumbura (via rail/lake)	1,446	2,403	1,284	-47	524	302	-42	152	119	-22
Port Node*										
Dar Es Salaam		319	199	-38	291	125	-57	245	266	9

Note: Port values are included in the total shown for each destination.

Source: Nathan Associates Inc.

Table 8-6 presents the improvement in performance for Central Corridor exports of light containers. The changes in terms of reduction in price are similar to those described above for imports.

Table 8-6. Improvement in Central Corridor Performance for Exports with Proposed Action Plan Projects, 2015 (light containers)

Origin	Distance (km.)	Containers (TEU)								
		Price (US$)			Time (hours)			Reliability Indicator (%)		
		2010	2015	Var. %	2010	2015	Var. %	2010	2015	Var. %
Mwanza (via road)	1129	1,618	1,446	-11	396	207	-48	283	238	-16
Goma (via road)	1640	3,314	2,981	-10	454	250	-45	248	198	-20
Kigali (via road)	1495	3,618	3,292	-9	599	367	-39	200	163	-19
Bujumbura (via road)	1567	4,369	3,965	-9	480	275	-43	234	180	-23
Kampala (via rail/lake)	1,568	2,507	1,444	-42	638	324	-49	220	156	-29
Mwanza (via rail)	1,229	1,794	715	-60	517	204	-61	271	243	-10
Bujumbura (via rail/lake)	1,446	2,403	1,586	-34	633	317	-50	222	160	-28
Port Node*										
Dar Es Salaam (rail)		319	199	-38	397	143	-64	351	344	-2
Dar Es Salaam		319	199	-38	325	143	-56	326	315	-3

Note: Port values are included in the total shown for each origin.

Source: Nathan Associates Inc.

IMPACT ON TRADE FLOWS

Trade flows are expected to increase without a significant improvement in corridor performance, but could increase substantially with performance improvements as noted in above. These increases are related to the percentage decreases in price, transit time, and variation in transit time (unreliability) for each trade flow. The elasticity indicating the relationship between traffic and generalized cost was calculated using a gravity model. In this

model, the total trade between pairs of trading partners is a function of the economic size of each country (GDP and population) and the disutility of shipping freight between them[1]. The results of the model indicate that the generalized cost has significant adverse effects on trade flows analyzed regionally (within East Africa) as well as with overseas partners.

The results shown in Table 8-7 for 2015 indicate an average potential increase in trade of 15 percent. The total potential trade increase 9.2 million tons is significant on top of the already substantial traffic growth forecasted for the Base Case. Thus total Northern and Central Corridor traffic would be 61.9 million tons by 2015. The largest potential increase in trade is shown for the Central Corridor with transit traffic increasing by 38 percent.

Table 8-7. Potential for Traffic Increases due to Improved Corridor Performance, 2015 (million tons)

Corridor and Type of Traffic	Base Case	Potential Increase	Total	% Change
Northern Corridor				
Transit	10.0	1.6	11.6	14%
Regional	5.0	0.8	5.8	14%
Domestic	20.3	0.9	21.2	4%
Total	**35.3**	**3.3**	**38.6**	**9%**
Central Corridor				
Transit	3.2	2.0	5.2	38%
Regional	1.5	0.7	2.2	32%
Domestic	12.8	3.2	15.9	20%
Total	**17.5**	**5.9**	**23.4**	**25%**
Total	**52.8**	**9.2**	**61.9**	**15%**

Source: Nathan Associates Inc.

Table 8-8 presents the potential for increased traffic due to improved corridor performance for 2030. The impact is similar to that discussed above for 2015. Total Northern and Central Corridor traffic would reach 172 million tons by 2030. Of course, realizing these increases depends on the ability of the region to overcome very challenging capacity constraints at border posts, railways, and ports.

[1] This disutility is assumed to be a combination of price, time, and reliability of these shipments and would be inversely related with trade output. Three elasticities were calculated: overseas trade for landlocked countries, overseas trade for coastal countries and trade between countries in the region.

Table 8-8. Potential for Traffic Increases due to Improved Corridor Performance, 2030 (million tons)

Corridor and Type of Traffic	Base Case	Potential Increase	Total	% Change
Northern Corridor				
Transit	24.7	3.9	28.6	14%
Regional	11.0	1.7	12.7	14%
Domestic	54.0	2.5	56.5	4%
Total	**89.6**	**8.2**	**97.7**	**8%**
Central Corridor				
Transit	12.1	7.8	19.9	39%
Regional	2.6	1.3	3.8	33%
Domestic	40.3	10.5	50.9	21%
Total	**55.0**	**19.6**	**74.6**	**26%**
Total	**144.6**	**27.8**	**172.3**	**16%**

This analysis has shown that implementation of the recommended projects will bring major improvements in the cost, transit time and reliability of the logistic chain of the Northern and central Corridors. These gains will promote and facilitate trade and economic growth to significantly contribute to the attainment of the region's leaders and people development aspirations.

As regards addressing long-term capacity constraints to cater for projected huge volumes of traffic, we are aware that there will be need for implementing other projects beyond the short to medium actions we have recommended. We are also aware there are plans and efforts to develop new capacities in new ports, rail modernization and expansion as well as more road upgrades and further capacity expansion. We have reflected these plans and expect that clear development options and strategies will have emerged by the time the recommended action plan is fully implemented. However we consider the recommended Action Plan to be a strong foundation that is needed to hold future developments. It creates corridor infrastructure that gives confidence to potential investors in economic or traffic generating projects or activities. Such investment will catalyze the increase in demand to support implementation of the long-term of projects that are being proposed.

Appendix A Project Profiles

No.	INFR-P-01		
Name:	Mombasa Short-term Container Handling Capacity Enhancement with ICDs	**Action Plan Period:**	2010-2013
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure
Corridor:	Northern Corridor	**Country(ies):**	Kenya
Agencies Involved:	KPA, CFSs, KMA, Ministry of Transport, KRA		
Related Projects (Donors):			

Background/Rationale:

The Mombasa container handling terminal (Berths 16 – 18) is operating at full capacity: Berth occupancy in 2009 was at around 90 percent as opposed to ideal 70 percent or below. Even with the supplemental container handling capacity at conventional terminal (Berths 11 – 14) the estimated combined port container handling capacity of 600,000 TEU is below the 2009 throughput of around 620,000 TEU. Planned new capacity, in particular new Kipevu terminal, is expected to be available 2013 – 1014, more likely the latter date. Given the continued growth of container traffic, recorded at an average 9 percent during 2005 – 2009, this means that without any other intervention to create additional capacity in the short-term, there will be severe congestion with disastrous results for the port and trade in three to five years until new terminals or additional capacity is available.

Congestion in the port container yard with trucks and people involved in delivery or off-take of cargo contributes to impeding movement of equipment, especially cranes, resulting in low equipment and Berth productivity (recorded at around fifteen moves/Berth-hour compared to around sixty moves/Berth-hour achieved by comparable ports in Asia and South America). In addition, there is no possibility to increase space beyond the 250 m width (compared to 400 – 500 meters for modern container terminals). During the last crisis of severe congestion, the off dock ICDs, known in Mombasa/Kenya as CFSs, were engaged in 2007 and have helped decongest the port. In this regard, some of domestic containers are transferred to CFSs and in the process removing some of the activities from the port container yards to create more operating space. The proposal is to build on this experience by formally integrating CFSs into the port system to create much needed additional space, higher productivity and, thus, additional capacity to handle ships and containers.

Current Status:

Seven off-dock ICDs/CFSs are reported to handle containers (out of licensed seventeen). CFSs handle only a fraction of domestic containers; transit, reefer, oversize, hazardous and direct import containers are cleared at the marine terminal. KPA nominates or directs the allocation of boxes to CFSs. CFSs are also obliged to use KPA tariff which allows free storage until after five days after which payments start and increase steeply to deter long storage. The tariff is not economic and competitive between CFSs.

Description/ Major Components:

The proposed off-dock ICDs/CFSs Integration Program comprises (1) Relocating all container processing activities from marine yard to CFSs, thus moving entire ships to CFSs, contracted by shipping lines competitively (based on quality of service and price). Possible exception could be ready to go rail bound boxes; (2) Simplifying of transfers between marine yard and CFS, including automation of marine gate and use of high capacity and specially tagged trucks to provide shuttle services; and (3) CFSs enhancing facilities and technical competency to handle increased transfers from marine yard and to service clients,

Critical Factors for Success:

(1) Securing acceptance of the proposal by key players and decision makers especially Government, KPA and KRA. The proposal has been discussed by stakeholders at a roundtable meeting and adjudged beneficial; (2) Instituting a regulation that will invoke accreditation of CFSs based on transparent known criteria, define and guide the relationship between the port (marine terminals), shipping lines and CFSs and create a competitive environment for CFSs operations; and (3) clarifying implementation challenges including concerns expressed by stakeholders.

Expected Benefits/ Impacts:

(1) - Increasing capacity in the short-term to avoid disastrous congestion: It is estimated that implementation of the CFS integration program may result in increase of capacity up to 1,350,000 TEU that would be adequate for at least another five to eight years; (2) Avoiding the cost associated with long waiting times of ships, low productivity of expensive Berth facilities and equipment as well as surcharges by shipping lines: these far outweigh the additional costs and extra time for transfers to CFSs

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Facilities improvement, equipment, automation of marine gate, acquisition of special vehicles, improvement of access to CFSs	2011	8 months	34	Yes
Technical Assistance to (1) establish regulation and guidelines and (2) to KPA and CFSs for implementation	2011	8 months	1	No
TOTAL			35	Yes

No.	INFR-P-02		
Name:	Dar es Salaam Short-term Container Handling Capacity Enhancement with ICDs	**Action Plan Period:**	2010-2013
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	TPA, ICDs, SUMATRA, Ministry of Transport, TRA		
Related Projects (Donors):			

Background/Rationale:

The Dar es Salaam container handling terminal (Berths 8 – 11) is operating at full capacity: Berth occupancy in 2009 was at around 90 percent as opposed to ideal 70 percent or below. Even with the supplemental container handling capacity at conventional terminal (Berths 5 – 7) the estimated combined port container handling capacity of 310,000 TEU is below the 2009 throughput of around 354,000 TEU. Planned new capacity, in particular a new terminal at new Berths 13 - 14, is expected to be available 2014–2015, more likely the latter date. Given the continued growth of container traffic, recorded at an average thirteen percent during 2000 – 2008, this means that without any other intervention to create additional capacity in the short-term, there will be severe congestion with disastrous results for the port and trade in three to five years until new terminal or additional capacity is available.

Congestion in the port container yard with trucks and people involved in delivery or off-take of cargo contributes to impeding movement of equipment, especially cranes, resulting in low equipment and Berth productivity (recorded at around twenty moves/Berth-hour compared to around sixty moves/Berth-hour achieved by comparable ports in Asia and South America). In addition, there is no possibility to increase space beyond the 200 m width (compared to 400-500 m for modern container terminals). During the last crisis of severe congestion, the off- dock ICDs were engaged in 2007 and have helped decongest the port. In this regard, some of domestic containers are transferred to ICDs and in the process removing some of the activities from the port container yards to create more operating space. The proposal is to build on this experience by formally integrating ICDs into the port system to create much needed additional space, higher productivity and, thus, additional capacity to handle ships and containers.

Current Status:

Six licensed ICDs are reported to handle containers (with additional five under development). ICDs handle only a fraction of domestic containers; transit, reefer, oversize, hazardous and direct import containers are cleared at the marine terminal. Shipping lines determine the allocation of boxes to ICDs. However, ICDs are obliged to use TPA tariff which allows free storage up to seven days after which payments start and increase steeply to deter long storage. The tariff is not economic and competitive.

Description/ Major Components:

The proposed ICDs Integration Program comprises (1) Relocating all container processing activities from marine yard to ICDs, thus moving entire ships to ICDs, contracted by shipping lines competitively (based on quality of service and price). Possible exception could be ready to go rail bound boxes; (2) Simplifying of transfers between marine yard and ICDs including automation of marine gate and use of high capacity and specially tagged trucks to provide shuttle services; and (3) ICDs enhancing facilities and technical competency to handle increased transfers from marine yard and to service clients,

Critical Factors for Success:

(1) Securing acceptance of the proposal by key players and decision makers especially Government, TPA and TRA. The proposal has been discussed by stakeholders at a roundtable meeting and adjudged beneficial; (2) Instituting a regulation that will invoke accreditation of ICDs based on transparent criteria, define and guide the relationship between the port (marine terminals), shipping lines and ICDs and create a competitive environment for ICDs operations; and (3) clarifying implementation challenges including concerns expressed by stakeholders.

Expected Benefits/ Impacts:

(1) - Increasing capacity in the short-term to avoid disastrous congestion: It is estimated that implementation of the ICDs integration program may result in increase of capacity up to 1,050,000 TEU that would be adequate for at least another eight to ten years; (2) Avoiding the cost associated with long waiting times of ships, low productivity of expensive Berth facilities and equipment as well as surcharges by shipping lines: these far outweigh the additional costs and extra time for transfers to ICDs.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Facilities improvement, equipment, automation of marine gate, acquisition of special vehicles, improvement of access to ICDs	2011	8 months	25	Yes
Technical Assistance to (1) establish regulation and guidelines and (2) to TPA and ICDs for implementation	2011	8 months	1	No
TOTAL			26	Yes

No.	INFR-P-03		2010-2014
Name:	Mombasa New Container Terminal – Kipevu West	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure/TA
Corridor:	Northern Corridor	**Country(ies):**	Kenya
Agencies Involved:	Kenya Ports Authority, Kenya Maritime Authority		
Related Projects (Donors):	Technical Design Nearing Completion. Dredging tendered. JICA Loan.		

Background/Rationale:

Mombasa Container Terminal (Berths 16 – 18) is currently operating at around 90 percent Berth occupancy, with an average annual growth in traffic since 2005 of 9 percent. The negative impact on vessel wait time, ship turnaround time at the port, and quay and yard operations require urgent action. Over one quarter of throughput is transit cargo, with 80 percent to Uganda. Construction of a new container terminal is critical to economic growth of Kenya and that of the land locked countries Mombasa serves. This will be KPA's first concession for terminal operations. In addition to this project, KPA is extending the existing terminal to Berth 19 (tenders submitted September 30, 2010) and plans to upgrade and convert Berths 11-14 to an additional container facility with a private operator. All these projects are expected to add capacity to the Mombasa container handling system from 2003. Therefore the new Kipevu Container Terminal project is within a broader strategy to meet the medium and long-term demand for container handling in the region.

Current Status:

The technical designs for the container terminal are being finished. A loan agreement has been signed with JICA for US$239 million to finance the terminal and related equipment and access road. Tenders for the dredging were submitted in February 2010. Consideration of legal requirements for a concession is underway.

Description/ Major Components:

The site is 100 hectares near the Kipevu Oil Terminal. The terminal will be built in 3 phases. (1) The terminal is designed to handle 450,000 TEU in the first year 2013 and, when completed, 1.2 million TEU. The JICA loan will cover construction, ship to shore gantry cranes, rubber tired cranes, an access road and construction and extension of yards, (2) A concessionaire will be recruited to provide handling equipment and operate. JICA will also assist with concessioning plan and selection. (3) A related dredging program for the entrance channel (15 m), widening the turning basin and Berth (11-15 m) will allow vessels carrying up to 4,600 TEU. (4) Extension of rail access to the terminal and buoy and channel markers in the access channel. (5) TA: A consultant to advise on the final terms for the concession based on experience with similar terminal concessions worldwide.

Critical Factors for Success:

(1) A strong tendering process that results in an experienced, competent and well-resourced operation. (2) A concession agreement that provides sufficient latitude for effective operation while requiring a defined level of performance. (3) An effective reporting and monitoring system that will insure the government achieves value from its investment. (4) A competition strategy and structure among the container terminals at Mombasa that will reduce price and increase performance.

Expected Benefits/ Impacts:

The second Kipevu terminal will double current container capacity by 2018 to meet the needs projected for the medium-longer term. High performance standards due to appropriate terminal design, experienced operator, optimal handling equipment and state of the art information systems to generate the needed coordination and speed to achieve internationally competitive performance standards at Mombasa.

Costs and Other Data:

The construction will be in three phases. The first phase is intended to commence in 2011 and be completed in 2013/4. Later phases will follow after opening. KPA will function as a landlord, while operations will be concessioned. Therefore the terminal and equipment will represent a PPP arrangement.

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Terminal	2011		240	Yes
Equipment	2012			Yes
TA-Concessioning and Competitiveness	2011		0.51	No
Dredging	2011		90	No
Road Access to Terminal, included in terminal financing	2012		12	No
TOTAL			342.50	Yes

No.	INFR-P-04		2011-2014
Name:	New Container Terminal at Port of Dar es Salaam	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	Tanzania Ports Authority, private sector logistics operators		
Related Projects (Donors):	Existing Concession with TICTS, Government of China		

Background/Rationale:

In 2009, the Port of Dar es Salaam handled 373,500 TEU with a berth occupancy rate of 88.7 percent**.** Between 2000 and 2008, average annual growth rate has been 13.5 percent, meaning that additional capacity is urgently needed. The TPA concessioned the container terminal in 2000 to the Tanzania International Container Services (TICTS), with Hutchinson HP holding majority shares. TICTS achieved good performance standards initially. But traffic quickly outgrew the confined container terminal from 2004 resulting in severe congestion in a few years thereafter. Congestion on the quayside directly affects ship unloading/loading speed, leading to delay charges, and yard congestion leads to high stacks and long dwell time.

The container terminal is located at Berths 8-11, after Berth 8 was added in 2005 and confirmed in 2010 on conclusion of a renegotiated extension of the TICTS lease agreement, Conventional Berths 5 – 7 are also used to handle containers as well. Container stacks also operate behind some of the bulk and break bulk berths. In 2008, dwell time reached twenty-eight days and the port sought to relieve the capacity problems in the port by using ICDs to do the clearances for domestic cargo. This has improved port performance but has not addressed future capacity needs given the high rate of container traffic growth. Consequently, within the recently completed Ports Master Plan (2009) TPA has determined that a new terminal was needed. TPA plans to develop the terminal and tender it to a private operator, preferably in competition with TICTS.

Current Status:

A feasibility study was completed in 2010. A consultant to prepare detailed design has been procured and design is ongoing. Negotiations are ongoing with the Chinese Government to provide financial support. The experience with the first concession will be taken into account in designing a legal agreement with the second concessionaire.

Description/ Major Components:

Construction of Berths 13-14 upstream next to Berth 12, the Kurasini oil jetty (KOJ). This is the only area where additional container capacity can be created in the near term. The terminal consists of a quay with a length of 650 m that can accommodate two large container vessels and a small feeder vessel. This terminal will have a capacity of 600,000 TEU. It is in a relatively confined area, which will affect design of the channel and adjustment of the KOJ, by either relocation or shortening the pipes as proposed in the Master Plan.

Critical Factors for Success:

The success factors for the project will be dependent on availability of financing, a good procuring system for the operator, the experience and commitment of the operator selected and the terms of the agreement between the operator and TPA. The market demand is such that the likelihood of a successful operation is high.

Expected Benefits/ Impacts:

The existing container terminal is operating at full capacity and is not adequate to cater for current and future demand. Productivity is also low due to restricted movement of equipment in the limited space. Once both the existing and new terminals operate at more optimum levels, better port performance is expected. Having two competing terminals should drive the cost and delays down thus benefitting the shipper. The diagnostic study demonstrated that the port constituted the single greatest delay factor on the corridors. It is expected that the second terminal will assist to decongest both terminals, thereby reducing the delay factors at the port, beyond the short-term relief expected from implementing the proposed integrated ICD system

Costs and Other Data:.

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Container Terminal at Berths 13-14	2011	3 years	500	Yes
TOTAL			500	Yes

No.	INFR-P-05		2010-2013
Name:	New Road Access to Dar es Salaam Port	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	TANROADS, Ministry of Works, Ministry of Transport, TPA		
Related Projects (Donors):			

Background/Rationale:

Heavy Goods or commercial vehicles destined to or from the port of Dar es Salaam have to drive to heavily congested areas in the city via Bandari Road, Mandela Highway and Morogoro Road/TANZAM Highway. The areas of notable urban traffic extend to between 15–20 km from the port. Sometimes during peak hours the heavy duty vehicles are required to park around 15 km away to wait for off peak times. These roads carry traffic to Southern Tanzania and Southern Africa (Zambia, Malawi and DRC/Katanga), Central and Western Tanzania and Central Africa/Great Lakes countries (Burundi, Rwanda, Eastern DRC and Uganda) and Northern Tanzania and Kenya. They all use a common section up to 100 km away (Chalinze) where traffic to the north branches off.

The proposal is to develop a highway which bypasses these congested areas from the port to rejoin the TANZAM Highway about 65 km away or more (Mlandizi or beyond). Due to the volume involved, this road is considered a good candidate for a toll road.

Mandela Road is undergoing rehabilitation and slight improvement with grade separated (flyovers) at critical junctions. There are also plans to further widen Morogoro Road and lengthen the distance with dual carriageway to about 25 km from the port. Some further ring roads are planned, which will take some of the traffic away from Morogoro road. However, at the rate that traffic is growing around Dar es Salaam and the expected continued vibrant economic growth of the Dar es Salaam port hinterland (Tanzania and neighbors), there is need to prepare adequately by looking for alternative options beyond these roads. Initially a feasibility study should be undertaken to establish the best option.

Current Status:

This project is still at conceptual stage. However, the Development Bank of Southern Africa had in 2008 expressed interest to finance a feasibility study for the road, as part of follow up to Central Development Corridor (CDC) work.

Description/ Major Components:

(1)- Feasibility study; (2) Transaction Advisory services to structure a PPP, prepare an RFP and assist with procurement of developers; and (3) construction and management of the road.

Critical Factors for Success:

(1)- Positive feasibility study results; (2) commitment of Government to implement a PPP; and (3) a conducive environment for PPP.

Expected Benefits/ Impacts:

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
New Road Access to Dar es Salaam Port (feasibility study to construction)	2011	48 months	40	Yes (for construction and management)
TOTAL			40	Yes

No.	INFR-P-06		2011-2013
Name:	Mombasa Kipevu Petroleum Terminal	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure
Corridor:	Northern Corridor	**Country(ies):**	Kenya
Agencies Involved:	Kenya Ports Authority		
Related Projects (Donors):	Pipeline Upgrading and Uganda Petroleum Developments		

Background/Rationale:

Kipevu Oil Terminal handles crude oil and refined oil products and can accommodate vessels to 85,000 DWT and up to 198 m long. In 2008, it was at 78 percent Berth occupancy and in 2009 was at 86.5 percent. Vessel delays to Berth currently cost the petroleum industry an average of US$100 million annually. The port needs new petroleum capacity urgently. The Shimanzi Oil Terminal, which can accommodate vessels up to 35,000 DWT and 259 m long, handles chemical and other liquid products. This terminal was operating at 62.5 percent capacity in 2008 and 75 percent in 2009. KPA considers it "tending toward saturation". Therefore the Port of Mombasa has a major problem with liquid bulk products. This affects not only Kenya, but also Uganda, Rwanda and any other country importing petroleum and other liquid bulk through the Port of Mombasa.

Current Status:

An international tender was issued by the National Oil Corporation of Kenya in late 2010 for a technical feasibility study of the construction of an offshore petroleum offloading jetty at Mombasa. EOIs were due December 3, 2010. It can be assumed that a full contract will be issued during 2011.

Description/ Major Components:

The project is designed to meet the need for additional liquid bulk capacity through design of a BOT project for a single buoy point or off shore jetty system. The project is valued at US$55 million and will involve the Government of Kenya and the private sector. It will be further defined by the feasibility study.

Critical Factors for Success:

It will be critical to develop a BOT framework that meets the Kenyan and regional need for petroleum and sufficiently rewards the private sector for participation. Appropriate connections to the Kenyan pipeline are essential to success. Review of the pipeline capacity is also being undertaken. Decisions on the pipeline and estimates of total regional demand will be affected by the development of the petroleum fields in Uganda. The first area is underway and a feasibility study is being conducted for a Ugandan refinery.

Expected Benefits/ Impacts:

Due to the saturation level at the petroleum terminal, this project has high priority. The chemical products terminal project is essential to the further development of manufacturing in the region and to the mineral development currently being increased.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Feasibility Study	2011	9 months	0.8	
Construction and Installation	2012	24 months	55	Possible BOT
TOTAL			55.8	Yes

No.	INFRA P-07		2011-2013
Name:	Mombasa Dry Bulk and General Cargo Facilities	**Action Plan Period**:	
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure
Corridor:	Northern Corridor	**Country(ies):**	Kenya
Agencies Involved:	Kenya Ports Authority, Private sector logistics operations		
Related Projects (Donors):			

Background/Rationale:

Mombasa Port handles dry bulk at Berths 1-10, operated by KPA, and at Mbaraki Wharf, which is a common user facility. Because the handling of dry bulk varies by commodity, port saturation is also determined for each commodity. For example, for wheat a berth occupancy maximum of 60 percent has been set since all wheat must be unloaded at berth 3 to use the conveyor to Grain Bulk Handlers Ltd. (GBHL) silos. The analysis in the Master Plan indicates that for coal, clinker and fertilizers, whether handled at Berths 1-10 or Mbaraki Wharf, construction of a new berth will be necessary, possibly at Dongo Kundu. Bulk handling is often inefficient and slow by international standards leading to delays of ship departure. The delay charges are passed to the buyer making fertilizer, clinker and other bulk products more expensive for the end user. GBHL estimates, for example, that the cost of fertilizer could be reduced 25 percent with a good bulk handling system for fertilizer at the port. In 2007, 1.5 million tonnes of fertilizer, clinker and coal in total moved through Mombasa Port in 2007. The total is estimated to increase to 2.38 million by 2013.

Current Status:

KPA reports 74.3 percent overall berth occupancy in 2006, 66.2 percent in 2007 and 57.2 percent in 2008. While lower in 2008, KPA rates Mbaraki Wharf as tending to saturation and needing attention. The master plan reviewed the current facilities and usage, made projections for future growth and proposed project components to improve port efficiency in handling dry bulks.

Description/ Major Components:

Mbaraki Wharf: It is proposed to use this facility for all dirty bulk cargo, such as clinker, coal, iron ore, fertilizers, etc. Components of proposal: (1) new access bridges. At present, only trucks of 7 tonnes or less can use the bridge and turn in the port. Therefore it is necessary for them to collect cargo, dump behind the wharf and use front end loaders to load larger, articulated trucks for haulage. It is proposed to build two new bridges that can accommodate articulated trucks entering the wharf. This is time consuming, costly and increases the air pollution from port operations. (2) dust suppression. Operators should improve off-loading and loading practices and keep the dust screens well maintained. (3) berth deepening. Berth should be deepened to -12.5 m to allow larger ships to dock, thereby reducing cost and making the wharf more efficient. The pilings are deep enough to allow this. Dredging should be done at the same time the new bridge is built. (4) berth extension. It is recommended that the berth be extended by 220 m, based on projections of demand. Depending on the availability at Berths 1-10, it may be possible to delay until a new berth can be built at Dongo Kundu. A power station is being constructed at Dongo Kundu and will need to import 1 million tonnes of coal per annum. This could be handled by a dedicated jetty or a common user bulk facility. It is possible to develop a new dry bulk facility in conjunction with this facility for cost sharing. Decisions on berth extension are likely to wait until these issues of location and consolidation are determined.

Berths 1-10. The master plan suggests the following use for Berths 1-10. Depending on final decisions on location of specialized facilities, there will be construction and equipment procurement to be tendered. Berth 1 should continue to be used for RoRo vessels and cruise ships at present. Development of a cruise ship terminal is in the planning stages. Berth 3 should continue to be used for grain and the conveyor extended to Berth 4. Berth 5 should be used for RoRo vessels and general cargo such as steel. It could also be converted to an additional grain terminal. Berth 7-10 should continue to handle general cargo, bulk liquids and any dirty bulks that cannot be handled at Mbaraki Wharf. Berth 9 is used by the soda ash industry which intends to install high capacity conveyors once traffic picks up again. The main changes are some repaving and taking down some sheds to allow more storage areas.

Critical Factors for Success:

Terminal and berth usage needs to be responsive to demand. Many of the project proposals are contingent on volumes and pressures in other parts of the port. Success will depend on good monitoring and coordination of use areas within the port. The effectiveness of the changes is also dependent on the flexibility built into the design and on operational adjustment to new facilities.

Expected Benefits/ Impacts:

The effective operation of bulk handling and general cargo is essential to agriculture and industry for Kenya and the inland countries. The impact of the new access bridges is the efficiency of a single loading and reduced dust caused during the second loading at the back of the port. Avoidance of double handling will also reduce the cost of the products. Cost savings are estimated at US$0.11 per tonne. Wharf deepening will allow larger ships which are more efficient and thereby reduce the cost of imports.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
2 new access bridges	2011		1.5	
Deepening berths to -12.5 m	2011		0.2	
Berth extension or new berth construction	TBD			
TOTAL			1.7	No

No.	INFR-P-08		2012-2013
Name:	Dar es Salaam Dry Bulk and Break Bulk Facilities	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	Tanzania Ports Authority		
Related Projects (Donors):			

Background/Rationale:

The port handles about 95 percent of Tanzania's international trade as well as transit cargo for Burundi, Rwanda, Uganda, DRC on the Central Corridor. It has a rated capacity of 4.1 million dwt dry bulk cargo. This is sufficient for the near term, but high estimates put the requirement for 2023 at 4,779 and for 2028 at 6,056. The efficiency of the operation is also a major factor, with delays in ship offloading causing penalty charges which are passed to customers. Dry bulk is generally handled at Berths 5, 6and 7, but only 7 can handle vessels with drafts exceeding 10 m. Cement, clinker and coke are transported by truck directly to the cement plant. Bulk grain and fertilizer is bagged on the quay which slows offloading and restricts movement on the quay. The Port Master Plan recommended that bagging at shipside should be discontinued and commodities moved directly to bulk storage facilities where bagging can be done. The Grain Terminal has a fully automated silo for handling import and export grain including three bagging units. Grain is transferred from the quay by ten dump tractors to a silo that holds 30,000 tons. The existing silo should be used for intermediate storage to increase the unloading capacity on the quay. The storage capacity should be increased to 60,000 tonnes. A private organization, the Dar es Salaam Corridor Group, is building a grain facility close to the port, and is designed to be linked to the terminal with conveyors.. Cement should be transported by conveyor belt to the packaging area at the back of the port. Fertilizers should be stored in a bulk warehouse, Shed 7, where it can be bagged and loaded on trucks or rail wagons. Other dry bulks can be handled at berths 5,6 or 7 and stored in a shed based on allocation and availability.

General cargo is also increasing although more slowly. It is expected to approximately double from 2013 to 2023, from 655,000 to 1,317,000 tonnes. By 2028, it is estimated to be 1,842 tonnes. Break bulk is currently offloaded at Berths 1-7, depending on vessel draft and berth availability. Heavy and dangerous goods are loaded immediately on rail. Other goods are taken by truck to storage yards. To accommodate this growth and achieve greater efficiency, Berths 1-4 should be deepened to allow larger ships and make better use of the existing port.

Current Status:

Tanzania Ports Authority has begun to implement these recommendations. Two tenders were issued in late 2010 for award in early 2011 for study of the silo and silo system at the port and provision of bulk handling facilities for grain and fertilizer. Separate tenders were issue for civil works for handling grain and fertilizer. Other tenders were issued including for paving the area previously occupied by shed 4 to increase the yard area and procuring additional handling equipment and port vehicles. Some dredging is ongoing. These developments will take on board the facilities being developed by the private sector, in particular the Dar es Salaam Corridor Group.

Description/ Major Components:

Dry Bulk: (1) Creation of a specialized dry bulk terminal at Berths 5-7 and dredging to -12 m**.** Sufficient quay length is available. Quay construction needs to be strengthened to accommodate heavier cranes and deeper

drafted vessels. A conveyor belt is planned to move cement to the packaging area. It needs to be above ground and high enough for vehicles to pass underneath. A traffic circulation pattern is needed for all the trucks moving between quayside and port storage facilities. (2) Expansion of the grain silo from 30,000 to 60,000 tonnes to allow handling of larger vessels.

Break Bulk: (1) Strengthening the quay at Berths 1-4 and dredging to a depth of -12 m. A quay wall is to be constructed at the current lighter quay adding land fill behind it to add 260 m to the quay length, which is anticipated to meet requirements until 2028. This can be done at the same time that the access channel is dredged to -12 meters. (2) Developing a dedicated general cargo facility at Berths 1-4. Plans to use the storage space behind berths 1-7 for break bulk and dry bulk should be made and implemented once the new container terminal relieves the need for container storage in this area.

Critical Factors for Success:

Implementation requires that the short-term solution of more effective use of ICDs is implemented to reduce the spillover of containers into other areas. At the same time, the development of the new container terminal at Berths 13-14 is also a critical success factor. Both will enable the development of dedicated terminals for dry bulk and break bulk/general cargo and better offloading and handling practices because of reduced congestion at the quay side, yard and storage areas.

Expected Benefits/ Impacts:

Both dry bulk and break bulk are increasing rapidly. The development of dedicated terminals and more efficient handling operations will foster this growth. In both cases, larger vessels are encouraged through greater depth and length of the quay. This will enable faster loading and unloading times and should mean lower costs due to economies of scale and improved productivity. Many of the industries developing in the area are dependent on cost effective transport of inputs such as grain for milling, seed and fertilizer for agriculture, equipment for agriculture and manufacturing, etc. All of these industries will benefit from the increased efficiency and lower cost made possible by the project. In case of surplus, based on the drive to rapidly expand agricultural production, exports will also be handled more efficiently and at reduced cost for competitiveness in the export markets.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Development of dry bulk terminal at berths 5 – 7 (dredging, berths, etc) and facilities (silo system, equipment, etc)	2011	24		Yes
Development of break bulk terminal at berths 1 – 4 (dredging, berths, etc) and related facilities	2011	24		Yes
TOTAL			5.0	Yes

No.	INFR-P-09		2010-2013
Name:	Dar es Salaam Single Point Mooring (SPM)	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Infrastructure
Corridor:	Central Corridor	**Country(ies):**	Tanzania, Zambia
Agencies Involved:	Tanzania Ports Authority (TPA)		
Related Projects (Donors):	TPA Master Plan		

Background/Rationale:

The original SPM was built in the 1970s to supply crude to refineries in Tanzania and Zambia. After closure of the Tanzanian refinery, it served only Zambia. Zambia consumed 15,300 barrels of crude, of which 15,110 are imported, in 2009. Its total refining capacity is 24,000. However, there are plans to establish a new modern refinery in Tanzania with new pipelines to Mwanza and Kigoma, Discussions have been carried out with potential international private sector developers. A significant share of Zambia's petroleum is crude oil shipped from the Port of Dar es Salaam via pipeline to the Indeni Petroleum Refinery in Ndola at a considerable savings in cost over importation of finished product by rail or road and reduced theft and accident risk. TAZAMA Pipeline is jointly owned by Zambia (66.7 percent) and Tanzania (33.3 percent). As part of the Tanzania Ports Master Plan, Royal Haskoning reviewed the market for petroleum through the port of Dar es Salaam and found a viable market in nearby countries.

Current Status:

A consulting consortium was contracted to act as financial and economic advisor to the project. It carried out traffic forecasts and analysis of the logistics, financial and economic impact of the project. In September 2010, Leighton International signed an EPC, fixed lump sum contract with TPA for construction of the US$66.48 million project.

Description/ Major Components:

The project consists of construction of the SPM and two subsea pipelines. One will be 28" in diameter for crude oil and one 24" for white product, with a length of 4.5 km and 4 km respectively. The SPM is being constructed southeast of the harbor entrance and will accommodate ships from 40-150 KDWT. (1) The project includes removal of the old SPM system and onshore pipelines. (2) The contractor is responsible for project management, design, engineering, procurement and construction. (3) It includes an ocean study and site survey. (4) The contractor will fabricate and install the SPM system, procure and install off shore pipelines and on shore pipelines. The contractor will test and commission the system. Construction will start in 2011 and is expected to be completed in 2012.

Critical Factors for Success:

The project is based on projections of increased domestic and regional demand for crude and white product to be delivered on the new system. It also assumes the probably redevelopment of a refinery in Dar es Salaam. The project viability will depend on the success in marketing the product regionally based on the reduced price of pipeline as opposed to road and rail transport delivery.

Expected Benefits/ Impacts:

TPA expects the new facility to provide increased revenue in addition to improvement in quality of service, safety, efficiency and the capacity to handle bigger vessels. The Port of Dar es Salaam and particularly the oil

terminals are congested with frequent wait times off shore and terminal delays. All these delays increase the cost of delivered fuel. The SPM should eliminate the delay factors for petroleum deliveries to Dar es Salaam and reduce the delays of other vessels using the entrance channel.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Fixed Price, Lump Sum Project Cost	2011	2 years	68.48	
TOTAL			68.5	Yes

No.	INFR-P-10		2010-2013
Name:	Lamu Corridor New Port and Associated Infrastructure	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Feasibility Studies
Corridor:	Northern Corridor	**Country(ies):**	Kenya – serving Kenya, Sudan, Uganda, Ethiopia, DRC
Agencies Involved:	KPA, Ministry of Transport, RECs		
Related Projects (Donors):			

Background/Rationale:

The original motivation for the development of a new port at Lamu in the 1970's, was the problem of congestion at Mombasa port, which serves as Kenya's only port for international trade, and which was considered to be approaching its maximum development capacity. Since then, the freight throughput at Mombasa has expanded more than threefold from 6 mtpa to more than 19 mtpa, and further expansion is being planned and implemented. However, long term expansion at Mombasa is limited, particularly for larger 'Cape Size' vessels, which are increasingly used for oil, bulk and containers. Manda Bay, located close to Lamu town, is considered ideal for the development of a deep sea port, with marine access depth of more than 18m.

At present, there is no infrastructure at Lamu to support the development of a major new port – services such as road and rail transport, pipelines, water, electricity, communications, housing including the basic infrastructure, will have to be incorporated into a new port development. The Lamu area has been declared as a world heritage site, and there will be environmental constraints on future development, particularly potentially polluting activities such as oil and bulk minerals exports.

During 2005/6, the Kenyan government, in discussions with southern Sudan and Ethiopia developed the ROOLA project, which included the following infrastructure components:

- Oil pipeline from Southern Sudan to Lamu
- A high speed standard gauge railway linking Lamu to Juba, with links to Addis Ababa and to Gulu in Uganda
- A super highway network linking Lamu to southern Sudan, Ethiopia, and the existing road network in Kenya and Uganda
- A fibreoptic cable along the main transport routes
- The development of an oil refinery and free port at Lamu.

The ROOLA project has effectively been replaced by the LAPSET project (Lamu Port, Southern Sudan, Ethiopia Transport Corridor) , aimed at developing a master plan for the port development, with the study to be completed during 2011. The intention is to fund the project through a PPP process.

Such a grand regional infrastructure project will require one or several major anchor projects in order to motivate the initial financing of the core infrastructure. This is likely to be one or several of the following:

- Oil exports from Southern Sudan, could be of the order of 500,000 bbl/day or +20 mtpa
- Oil exports from Uganda, could be up to 150,000 bbl/day or 7 mtpa
- Future iron ore exports form Mt Kodo in the DRC, up to 50 mtpa in order to justify the cost of a dedicated heavy haul line over 1,600 km
- The development of a new container terminal at Lamu, to serve southern Sudan, Ethiopia, and increased demand from the northern corridor, supplementing Mombasa port – this is viewed as a longer term project, given the current expansion projects at Mombasa

The development and timing of the bulk export project listed above are subject to political developments in respect of southern Sudan, and also to market forces and commodity price trends in respect of mineral exports. This will dependent on the finalization of development strategies, which will also involve governments, and when a sound business case presents itself, to allow the conclusion of long term contracts

Current Status:

During 2010, Japan Port Consultants were appointed to carry out a feasibility study, funded by the Kenyan Government, to be completed during 2011. KPA is directly involved in the study which is understood to be focused on the port master plan development for Lamu. The referendum on the independence of southern Sudan is taking place in early January 2011, the outcome of which will influence the structure and timing of the LAPSET project.

Description/ Major Components:

The initial focus is on the completion of the current feasibility study, and depending on the results of the study, this is likely to be followed by a detailed Environmental Impact Assessment. The study is expected to include future projections of regional trade and freight flows.

Critical Factors for Success:

The key success factor is in the first instance, a positive outcome of the feasibility study, and secondly, a positive EIA, which is necessary for any institutional funding of the project. For the project development as a whole, and as defined by LAPSET, the outcome of the southern Sudan independence referendum is clearly important. However, it is possible that the Lamu port development could proceed without the participation of southern Sudan – the feasibility should provide an indication of this.

Expected Benefits/ Impacts:

The possible long term economic benefits of a new port development at Lamu are:

- An alternative port serving east Africa, increased competition, improved performance lower prices
- Serving the land locked regions of southern Sudan and the undeveloped regions of Kenya and Ethiopia, with a possible free port at Lamu
- Supporting the development of bulk terminals for oil and minerals, which would be difficult to locate at Mombasa

Costs and Other Data:

Component	Investment Start Year	Duration	Cost (US$ million)	PPP Potential
LAPSET Port feasibility study	2010	1 year	6	No
Detailed Environmental Impact Study	2011	1 year	1	No
MOU or Agreement with major anchor project	2012	Open	Open	Yes
TOTAL			7	Yes

No. Name:	INFR-RL-01 Tanzania Railways Ltd Revival – Infrastructure and Equipment	**Action Plan Period:**	2010-2013
Mode or Subject Area:	Railway	**Intervention Type:**	Capital
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	Ministry of Infrastructure Dev, RAHCO, TRL		
Related Projects (Donors):	Procure and Retain TRL Management Team, WB support.		

Background/Rationale:

The Tanzania Railway Corporation/Tanzania Railways Limited (TRC / TRL) service has declined over the past five to six years and traffic levels have fallen to less than 30 percent of the previous highest levels, mainly due to the following events: (i) lack of investment and poor performance of the railways over the period, (ii) the suspension of the Ugandan rail ferry service; (iii) the 2009 flood damage, causing a six month service suspension, and (iv) the failure of the concession with Rites, operating as TRL. The absence of new investment, the declining income and lack of working capital resulted in deferred maintenance of both track infrastructure and equipment, which has severely restricted operating capacity.

TRL is unable to implement a short-term sustainable revival plan without a substantial capital investment, estimated to be about US$110 million over a two year period. The capital injection will be required to be justified by a detailed business plan to be prepared by a new management team to be appointed. The TRL service is particularly critical for Burundi, because it previously carried all Burundi's international trade, which is now routed via a much longer and more expensive road route. The same applies to trade with the eastern DRC through the lake ports of Kigoma and Kalemie. The TRL service also provides the shortest distance to any port from Rwanda, and the decline of the lake and rail service has resulted in Rwandan transit traffic being shifted from the Central to the Northern Corridor, at additional cost. As a result of the failed concession, the original budget allocated for the revival of the system is no longer available.

Current Status:

Government has initiated the process of selecting a new management team for TRL, in order to prepare the necessary business plan to support new funding. The World Bank has indicated its support during the 4th Joint Infrastructure Sector Review in Dar es Salaam, by requesting that the new business plan must be focused on core business only. Some funds have been made available from the World Bank for consultants and T/A support for TRL.

Description/ Major Components:

Funding and implementation of a (1) short term capital investment program for TRL and (2) provision of working capital, over a two year period, to secure the operational improvement of TRL under a new management team to be appointed. The main components of the investment program will be track repair and upgrading in specified areas. This will be supported by a complementary program for repair and refurbishment of TRL wagons and locomotives, with possible leasing of additional equipment as defined by the approved business plan.

Critical Factors for Success:

The conditions precedent for the short term capital funding of TRL are (i) that an experienced interim management team is put in place, with full executive powers, and (ii) that a realistic and bankable business

plan is developed, plotting clear route to the sustainability of the TRL services, including the future operating structure of TRL.

Expected Benefits/ Impacts:

The reintroduction of a reliable and cost competitive TRL service will have direct benefits for all the previous customers of TRL, by reducing transport costs and transit times, and by improving service predictability. This will lead to increased regional and international trade. It is also expected that the improved TRL service will initiate a shift of freight from road to rail, resulting in lower road maintenance costs and improved safety.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
TRL Revival – Capital expenditure project for the revival of TRL services	2011	2 years	110 (est.)	Government and donors
Total			110	No

No.	INFR-RL-02		2010-2013
Name:	TRL Locomotive Repair and Acquisition 2 to 3 years	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	TRL, RAHCO, MOID		
Related Projects (Donors):	TRL Management Contract, TRL Revival Investment		

Background/Rationale:

When the TRL concession commenced in 2006, the total diesel electric locomotive fleet numbered eighty-two units, of which only sixty-five were considered operational, but most of which suffered from deferred maintenance, which translated into very poor reliability. In addition, TRL has thirty-four smaller diesel hydraulic 'shunting' locomotives, of which twenty-seven were recorded as being active. The core of the mainline locomotive fleet consists of thirty-five Canadian MLW Bombardier locomotives, relatively small locomotives of 1,200 hp, of a similar size to those used by Uganda Railways. MLW in Canada ceased diesel electric locomotive production in 1985 (twenty five years ago), and were taken over by GE, which closed the plant in 1993.

The bulk of the TRL locomotive fleet can be considered to be beyond its economic life, although it has been possible to keep most of the locomotives operational through a process of continuous repair. When the Government and Rites of India TRL concession commenced operation in 2006, twenty-five used locomotives were imported from India on a lease basis to supplement and replace the MLW units. However the Indian locomotives were not put into service with TRL because of a dispute with the TRL workforce, which considered them to be no better than the existing TRL locomotives. Since then the Rites concession has been cancelled and the twenty-five Indian locomotives are the subject of a payment dispute, and are not being utilized – TRL is unable to increase freight traffic volumes without additional locomotives being put into service. A similar situation exists for the TRL wagon fleet.

Current Status:

The collapse of the Government and Rites TRL concession has resulted in withdrawal of the capital investment budget, and TRL is therefore unable to fund the locomotive repair and acquisition program. Without a reliable mainline locomotive fleet TRL is unable to provide competitive transport service, or to increase freight volumes – which will be necessary in order to achieve financial and economic viability.

Description/ Major Components:

An investment program aimed at increasing the TRL operational mainline locomotive fleet in accordance with the requirement of the revival business plan – likely to be not less than thirty locomotives being available at any time. There are several options which can be pursued simultaneously and jointly:

- Repair and upgrading of selected units in the existing MLW fleet. (mainline locomotives in South Africa continue to be upgraded and serviceable beyond the age of fifty years in the case of GM or GE units)
- Purchase of new locomotives, most likely remanufactured units, up to 2,000 hp, at a cost of about US$1.5 million each.
- Leasing of locomotives on long term basis, possibly including an agreement on the twenty-five small Indian locomotives already held, alternatively from other regional railway companies such as NRZ in

Zimbabwe, modified to 1,000 mm gauge, likely to cost up to US$1,200/day on a full maintenance basis.

Critical Factors for Success:

The justification for the funding of the TRL locomotive expansion program will be a realistic business plan which supports the investment in track infrastructure repair and upgrading, improved management and the commitment of existing and new customers to use the TRL rail service. The provision of locomotives and wagons can be arranged through a PPP structure.

Expected Benefits/ Impacts:

The provision of a reliable locomotive fleet is essential to the revival and future success of the TRL service, and for it to be increasingly competitive with the alternative road transport services.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
TRL Locomotive repair and acquisition	2011	2-3 years	Up to 30	Yes
Total			30	No

No.	INFR-RL-03		2010-2013
Name:	TRL Wagon Repair and Acquisition 2 to 3 years	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	TRL, RAHCO, MOID		
Related Projects (Donors):	TRL Management Contract, TRL Revival Investment		

Background/Rationale:

When the TRL concession commenced in 2006, the total wagon fleet numbered 1,847 units, of which 1,245 were considered operational, but many of which were 'outdated' in their function – such as cattle wagons and many of the large covered wagons, suitable for breakbulk only. Almost all the wagons are of the bogie type, having two sets of two 15 t axles, capable of carrying up to 43 t of freight. Many of the wagons also suffer from deferred maintenance, and poor reliability. Typically, it is the bearings, wheels and brakes that require attention. The bulk of the freight wagon fleet should ideally consist mostly of low sided open wagons, which can carry heavy bulk goods and also 'drop in' containers – two TEU, and also specialized container wagons and fuel wagons.

The current fleet consists of 232 high and low sided open wagons, 84 specialized container wagons, and 145 fuel tanker wagons. Many of the covered wagons, which number more than 720, could be converted to open wagons or container wagons. It is also a relatively cheap and simple process to convert older plain bearing wagons to more reliable and heavier roller bearing axles – this has been carried out extensively in South Africa, Zimbabwe and Mozambique where some serviceable and operating wagons are more than fifty years old. The configuration of the TRL wagon fleet needs to be updated to reflect the future projected freight profile, as defined by the new 'revival' business plan.

Current Status:

The collapse of the Government and Rites of India TRL concession has resulted in withdrawal of the capital investment budget, and TRL is therefore unable to fund the wagon repair, upgrading and acquisition program. Without a reliable and sufficiently large operational fleet, TRL is unable to provide competitive transport service, or to increase freight volumes – which will be necessary in order to achieve financial viability.

Description/ Major Components:

The TRL operational wagon fleet should be configured in accordance with the requirements of the revival business plan. Assuming an initial target of 3 freight train per day, a 7 day train turnaround, and train lengths of 30 wagons, a fleet of 700 to 800 wagons of the specified types should be available at all times. There are several options which can be pursued simultaneously and jointly:

- Repair, upgrading and modification of existing wagons, and where appropriate, conversion to roller bearing axles, and fitting of dual vacuum and air brakes.
- Purchase of new wagons, mainly container wagons or open bulk wagons, at a cost of about US$50,000 each. Fuel tanker wagons and other special purpose wagons will be more expensive, and should ideally be linked to specific transport contracts.
- Leasing of wagons on long term basis from other regional railway companies such as NRZ in Zimbabwe, modified to 1,000 mm gauge, likely to cost up to US$30/day on a full maintenance basis. Leasing will often promote a higher degree of equipment utilization.

- Encouraging customers to invest in or to supply their own dedicated wagons, to be operated by TRL, in exchange for a discounted rail tariff

Critical Factors for Success:

The basis of the TRL wagon demand and configuration will be a realistic business plan which supports the investment in track infrastructure repair and upgrading, improved management and the commitment of existing and new customers to use the TRL rail service. The provision of both locomotives and wagons can be arranged through a PPP structure, ideally linked to longer term transport contracts.

Expected Benefits/ Impacts:

The provision of an expanded and reliable wagon fleet, with a high degree of availability is essential to the revival and future success of the TRL service, and for it to be increasingly competitive with the alternative road transport services.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
TRL wagon repair, upgrading and acquisition	2011	2-3 years	20	No
TOTAL			20	No

No.	INFR-RL-04		2010-2013
Name:	RVR Infrastructure Upgrade - 5 years	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Northern Corridor	**Country(ies):**	Kenya / Uganda
Agencies Involved:	RVR, Kenya Railways, Uganda Railways		
Related Projects (Donors):	RVR Concession		

Background/Rationale:

The Kenyan and Ugandan railway systems are operated jointly by one concessionaire, Rift Valley railways (RVR), under two separate concession agreements. The RVR concession followed a similar sequential process to several other railway concessions in eastern and southern Africa:

- decline of the railway services,
- loss of traffic volumes and revenue,
- unsustainable loss-making operations, lack of investment,
- absence of infrastructure and equipment maintenance,
- decision to privatize operations
- lengthy and delayed process of concessioning / privatization, leading to further deterioration of assets and market
- flawed bidding process – selection of concessionaire
- operations in atmosphere of conflict, delay of investment schedule
- non performance of the concession

In the case of RVR, the original commercial shareholder and operator was unable to revive the operations of the railway services in the Northern Corridor, which continued to experience unacceptably high levels of equipment failure and major derailments – traffic volumes remained at low levels. During 2010, a new resourceful commercial shareholder gained control of RVR, with an initial commitment to invest US$290 million in the first phase of revival, with plan to increase traffic levels three-fold from the current approximately 1.5 mtpa to 4.5 mtpa.

RVR operates on a meter gauge line with coverage of about 2,735 km in Kenya and approximately 306 km in Uganda The poor condition of the track has lead to imposition of temporary speed restrictions on many sections across the track, resulting in about twenty major derailments per month and unpredictable transit times.

Current Status:

The agreements relating to the new commercial shareholder in RVR are in place, and the track repair and upgrading program has commenced in both Uganda and Kenya.

Description/ Major Components:

Initial repair and upgrading of specific sections of poor track in both Uganda and Kenya, which are the main causes of frequent derailments and restricted operating conditions. The Civil Engineering Five Year plan is phased in three stages.

(i) Addressing inherited maintenance deficit.
(ii) Programmed ongoing track maintenance activities.

(iii) Planned rehabilitation works for particular sections which require more attention than simple maintenance program.

The critical issue in the track rehabilitation program is a 30 km section between Mombasa and Nairobi where rails are worn beyond permissible wear, with damaged sleepers and missing / damaged fittings and fasteners including ballast deficiency. The estimated cost of repairs in KES 475 million (US$6 million, or US$200/km). Similarly, there is critical section in the Jinja region in Uganda, with severe speed restrictions and limited train lengths of ten wagons – work on this section has commenced.

Critical Factors for Success:

The key success factor is that the financing is secured and that the initial rehabilitation program is not delayed.

Expected Benefits/ Impacts:

The initial RVR repair program is aimed at achieving the removal of speed restrictions hence increased line capacity and the reduction of track related accidents and improved safety and efficiency of operations – improved reliability and transport competitiveness. One of the key objectives is for RVR to be able to operate trains between Mombasa and Kampala as a scheduled seamless service, without the need to change locomotives or to shorten train lengths.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Railway track repair and upgrading in Uganda and Kenya	2010	5 years	400	Yes
TOTAL			400	Yes

No.	INFR-RL-05		2010-2013
Name:	RVR Locomotive Rehab – 3 years	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Northern Corridor	**Country (ies):**	Kenya
Agencies Involved:	RVR, Kenya Railways, Uganda Railways		
Related Projects (Donors):	RVR Concession		

Background/Rationale:

RVR inherited thirty-nine mainline (Class 93/94) diesel electric locomotives from KRC, which form the core of the mainline fleet. These locomotives are North American GE U26Cs, fitted with 2,600 hp engines. A total of twenty-six were built in 1977 and the remainder in 1987 or later. The bulk of the mainline fleet is therefore thirty-seven years old, but continues to remain serviceable and suitable for rehabilitation and upgrading. In southern Africa, many of the mainline locomotives still in service are more than fifty years old, and continue to be serviceable.

RVR operations have been handicapped by the poor condition of locomotives. Out of the thirty-nine mainline locomotives inherited from KRC only twenty-five are currently in service with varying degrees of suspect reliability due to a back log or deferred maintenance. This has lead to a high rate of locomotive/trains failures in transit. Between January 2009 and August 2009, RVR experienced a total of 579 mainline locomotive failures – more than two per day, mostly due to engine failures.

Daily train targets have been six per day on the Mombasa – Nairobi section, now being revised with a target of nine trains per day, with four trains planned to transport containers. In order to meet this target RVR locomotives have been supplemented by locomotives hired from Magadi Soda Company, which operates their own train of the RVR lines between Magadi and Mombasa.

On the RVR Uganda section between Malaba and Kampala, the mainline locomotives are much smaller, similar to those used on the TRL system in Tanzania, 1,200 hp. During the 1980's the Nalukolongo railway workshop near Kampala were equipped and ungraded through a €40 million program by KfW, and it is well qualified to carry out full refurbishment of the Uganda locomotives, subject to financing being available. The longer term objective is to replace the Uganda locomotives with larger units similar to those operated in Kenya, to allow for seamless railway operations.

Current Status:

The locomotive repair program has been commenced by RVR in both Uganda and Kenya, with the initial objective of rectifying deferred maintenance and recommencing the standard maintenance programs.

Description/ Major Components:

Repair and upgrading of the existing RVR locomotive fleet in both Kenya and Uganda, in order to achieve availability of more than 90 percent: A major mainline locomotive overhaul is likely to cost more the US$0.5 million per unit. A similar program is being implemented for the wagon fleet.

Critical Factors for Success:

Given that the technical skills and workshop facilities are available, the main success criteria are the securing of the necessary finance, and a commitment to the agreed revival program.

Expected Benefits/ Impacts:

A more reliable and more competitive railway service, with improved asset availability and utilization, and lower operating costs – leading to increased freight volumes by rail.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
RVR Locomotive Rehabilitation	2010	5 years	20	Yes
TOTAL			20	Yes

No.	INFR-RL-06		2010-2013
Name:	RVR Mombasa Intermodal Yard and Equipment	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Northern Corridor	**Country(ies):**	Kenya
Agencies Involved:	RVR, Kenya Railways, Uganda Railways		
Related Projects (Donors):	RVR Concession		

Background/Rationale:

It is well known that the modal interface between port and the land services of road and rail, is where most time is lost, and significant additional logistics costs are incurred. This is mainly due to issues of documentation and customs clearance, but also because of poor interfaces with both road and rail. The rail facilities at many of the regional container terminals are poor, and the operating procedures have been partially inherited from the pre-containerization period - access via inefficiently operated marshalling yards, where trains are stopped, checked and often broken up or retained. Ideally, the intermodal trains should enter the port directly as a unit, with a detailed manifest of all the containers carried. The rail sidings at the Mombasa container terminal are 450 m long, capable of handling trains of up to thirty wagons, with loading and unloading by RMGs (rail mounted gantries). As the mainline track is upgraded, and the use of vacuum brakes is standardized, with increased traffic volumes, trains of up to fifty wagons should be allowed for. Conversion to standard gauge will allow much longer trains, but not yet justified by the traffic volumes. T

he Mombasa container terminal is far too narrow – about 200 m instead of the recommended 500 m – resulting in terminal congestion and interference between the road and rail services. If the proposed system of integrated near port ICDs is adopted, then both road and rail mode will became more efficient. With the planned expansion of the existing container terminal with Berth 19, it appears that the existing rail sidings can be lengthened to accommodate longer trains. It is important in any new development or conversion of conventional Berths, that utmost attention is given to the positioning and length of sidings, and the equipment specified. Clearly the layout, positioning and equipment selection for the intermodal rail sidings at the planned new terminal at Kipevu West must be determined in close liaison with RVR and KR.

Current Status:

RVR have operated unit or block intermodal trains in the past, and intend to reintroduce this for all rail container services to and from Mombasa. A commitment has been made by KPA to convert existing general cargo Berths to container terminals, possibly as PPP projects, and also to build the new terminal at Kipevu West

Description/ Major Components:

The lengthening of the rail sidings at the existing container terminals in conjunction with the extension of Berth 19, the provision of additional RMGs, and additional terminal equipment – reach stackers, rubber tired gantries and port tractor - trailer units. If the intermodal rail service is operated as a block or unit train, with fast loading and unloading times, there should be b]very little requirement for wagon shunting.

Critical Factors for Success:

The key success factor will be the commitment of RVR to operate a unit or block intermodal rail service, and the ability of RVR to enter into a performance based contract with KPA, or the relevant future operator

Expected Benefits/ Impacts:

The expansion, upgrading and successful operation of the Mombasa RVR intermodal rail terminal will improve service and, thus, promote rail services, and should assist in shifting both transit traffic and regional trade from road to rail. This will result in reduction of transport cost due to increased competition

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
RVR Upgrading of Mombasa Intermodal yard	2010	3 years	20	Yes
TOTAL			20	Yes

No.	INFR-RL-07		2010-2013
Name:	RVR Kampala ICD Development	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Northern Corridor	**Country(ies):**	Kenya, Uganda
Agencies Involved:	RVR, Kenya Railways, Uganda Railways		
Related Projects (Donors):	RVR Concession		

Background/Rationale:

The Ugandan and Kenyan railway systems are operated as an integrated railway service by RVR on a twenty-five year concession basis. The operation of the two systems is controlled by separate agreements, and is effectively operated as two systems with locomotive and crew changes at the Kenya / Uganda border. The operation of a truly seamless rail service between Mombasa and Kampala is presently prevented by the poor condition of sections of the Ugandan track infrastructure, which demands that lighter locomotives are used with shorter train lengths. In order for RVR to achieve its short term freight traffic projections of 4.5 mtpa, it will have to capture traffic from road, with a service which is more competitive with road. Ideally, unit trains should be operated between the terminal points, without the need to break up the train into shorter units – this will allow fast transit and turnaround times and reduced operating costs.

However, in most cases rail has the disadvantage of lack of flexibility, and requiring the delivery or pickup to and from the end customer to be carried out by road. The efficiency of the modal transfer points, normally located at the inland rail container depot or terminal (ICD), is critical to the competitiveness of rail. Prior to containerization in the 1970's, and the deregulation of road transport, it was common practice for the railway operators to deliver wagons to the customers sidings for loading and unloading. This is no longer considered operationally viable, because of the resulting low equipment utilization, unless it is a large customer with fixed consignments or dedicated wagons, and who is willing to pay extra for the wagon re-positioning service (for example Mukwano in Kampala for their edible oil imports).

The alternative is for the railway operator to have a highly efficient and well equipped container terminal, including customs services, where containers can be transferred between road and rail quickly and at a low cost. It is important for the railway operator to turn the unit train around as quickly as possible. The expansion and upgrading of the Kampala rail ICD is therefore an important part of RVR's marketing strategy. Previously, about eight years ago, it was also proposed to develop an ICD at Port Bell, and the viability of this will depend on how the Lake Victoria container services are operated in future.

Current Status:

It is RVR's stated intention to expand and upgrade their Kampala ICD as part of their targeting of the intermodal transit traffic. A similar development or expansion will take place at Nairobi and other major economic centers served by rail.

Description/ Major Components:

The existing yard is to be expanded and upgraded, with new equipment and longer rail sidings. Rail access should be directly from the main line and road access should be directly to the key ring roads and bypasses. Ideally train loading and unloading should be by RMG's, and yard equipment should be reach stackers and/or rubber tired gantries. There should be sufficient space for future major expansion – this is often a short coming of ICDs.

Critical Factors for Success:

The key success factor is the commitment by RVR to operate a reliable and scheduled unit train service to and from Kampala – the RVR ICD will attract other private sector logistics operators to move closer to the ICD, to offer distribution, consolidation and warehousing activities. This has happened at other inland successful rail freight terminals.

Expected Benefits/ Impacts:

The expansion, upgrading and successful operation of the Kampala ICD (rail freight terminal) will directly promote rail services, and should assist in shifting both transit traffic and regional trade from road to rail. It implies that services will be improved and costs be lowered form the increased competition. This, and similar developments elsewhere, is an essential element of the RVR marketing strategy.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Kampala ICD Development	2010	3 years	10	Yes
TOTAL			10	Yes

No.	INFR-RL-08		2010-2013
Name:	Dar es Salaam Cargo Freight Station	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Capital, PPP
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	Tanzania Ports Authority, Ministry of infrastructure Dev, WB		
Related Projects (Donors):	TPA promoted, WB supported with funds		

Background/Rationale:

The Tanzania Ports Authority (TPA) has recognized that the operational efficiency of the port of Dar es Salaam is being adversely affected by both congestion within the port terminals and by road congestion within the city. The implementation of a system of ICDs within the city has provided a solution to the problem of port terminal congestion, with resulting improved terminal efficiency, but the problem of city road congestion remains. In order to further improve the efficiency of the container terminal and to provide much needed additional space, it has been proposed to develop a system of near port ICDs, integrated with the port terminal operations, as an extension to the port. The intention is to transfer all import containers to the integrated ICDs by means of a low cost tractor trailer container shuttle service, except those containers which are specifically booked on rail (mainly transit traffic).

TPA has proposed to develop a Cargo Freight Station (CFS) in an area called Kisarawe, about 35 km from the port, and to connect this to the port terminals by dedicated railway shuttle service. The proposed CFS is connected directly by road to the Morogoro road (the main transit route) and also provided with direct rail connections to both the TRL and the TAZARA systems. The main function of the CFS is to serve as a road/rail transshipment centre for transit goods, a logistics center to provide freight consolidation, distribution and container stuffing and de-stuffing services, long term storage, car storage etc. A key objective is for the CFS to promote the development of a surrounding industrial zone, for further processing and value adding of exports and imports. Domestic imports will logically be routed through the integrated ICDs, and rail bound transit traffic will bypass both ICDs and the CFS.

Current Status:

The World Bank has supported the concept of CFS by funding pre-feasibility study, which was completed in December 2010. However, a detailed site selection study has not yet been carried out, and this could be done in conjunction with the issuing of an EOI, in order to test private sector investor and operator interest in the project. The World Bank has expressed readiness to support appointment of a transaction advisor for the project.

Description/ Major Components:

The development of a remote cargo freight station for Dar es Salaam, including the provision for a surrounding industrial development zone, as PPP project.: This will require coordination within TPA on the main functions of both the ICDs and CFS, and planning of the shuttle services. Commitments will be required from TRL and TAZARA for the planned railway connection to the CFS, and from Tanroads for the road connection.

Critical Factors for Success:

The key success factor will be the ability to attract private sector investment for the project. For that reason the investors should also have an influence on the final location of the CFS. Contractual commitments from TRL, TZARA and Tanroads will also be necessary

Expected Benefits/ Impacts:

The economic benefits of the CFS development will include further decongestion of the port terminals especially in the long-term, beyond the relief achieved by the current ICD operations and to be further improved by implementation of the proposed integrated ICDs. The CFS will be connected to the port by a rail shuttle and this should result in significant decongestion of the city roads because all transit imports, accounting for about 40 percent of total imports, could either be transported directly from the port by rail, or be transferred by rail shuttle to the CFS. The CFS should promote the shift from road to rail for container traffic. The intention is for the CFS to promote industrial development and employment.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Development of Kisarawe CFS, including road and rail access, services, industrial zone	2012	3 years	183 (Capex including road and rail infrastructure)	Yes
TOTAL			183	Yes

No.	INFR-RL-09		2013-2016
Name:	TRL Track Infrastructure Upgrade – 3-5 years	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	TRL, RAHCO, MIOD		
Related Projects (Donors):	TRL Revival Investment, TRL Concession		

Background/Rationale:

The TRL railway concession, which operated from 2007 to 2010, was not successful, in that did not achieve the objectives set out in the concession agreement. The revival of the TRL services is now in the hands of the Government through RAHCO, with the initial objective of putting in place a new management team, whose first task will be to prepare a detailed business plan for TRL, which will provide the basis for new investment to restore TRL to a viable and sustainable business. This first phase of revival will seek to increase freight traffic volumes from the current 0.5 mtpa level to the previous levels of about 1.5 mtpa, achieved more than seven years ago – it will mainly be focused on track infrastructure repair and maintenance in order to improve reliability and reduce train transit and turnaround times. Locomotive and wagon reliability and availability will also have to be improved, but the financing requirements can be linked to customer contracts, as has been done on the TAZARA system.

Once the initial two year revival program has been completed, a new commercial operator for TRL will be sought, most likely a new concession, whose objective will be to further increase traffic volumes, particularly transit freight and to serve the developing gold and nickel mining sector. Nickel exports could generate very large rail volumes of imports and exports. The current track TRL infrastructure consists of long sections of light 30 lb/yard track, mostly in poor condition. The RAHCO action plan presented to the 4th JISR in September 2010, earmarked 330 km of track due for urgent upgrading, including strengthening of bridges to carry heavier axle loads.

The main objective of the medium term TRL infrastructure upgrade is to replace all the 30 lb/yard track with new rails of not less than 40 lb/yard, in order to increase permissible axle loads and the operation of longer trains at higher speeds. Increased volumes will also bring the need for improved signaling systems. The proposals for the construction of a new railway line from Isaka to Rwanda and Burundi are seen as a longer term development, most likely linked to demand from the mining sector for bulk exports – similarly the proposals for a new standard gauge railway from Dar es Salaam to Isaka. Upgrading of the existing TRL track could in some sections be carried out with provision for future conversion to standard gauge.

Current Status:

TRL is currently in an interim phase, being managed through RAHCO, but with no access to new investment funds. It appears that the Government has adopted the approach of appointing a new management team to prepare a new business plan, which will form the basis of the two year revival budget. After operations have been 'stabilized' and performance has been improved, consideration will be given to structuring new concession.

Description/ Major Components:

Phased upgrading of the TRL track infrastructure and signaling systems to allow more 'modern' and competitive train service to be operated – axle loads for 18 t to 20 t, longer trains, faster transit and turnaround times, and greater reliability. In the first instance, this will entail the track infrastructure to be upgraded with

heavier rails and structures to a uniform standard on all the main lines, commencing with the lines between Dar es Salaam, Mwanza and Kigoma. It is expected that the rail service to Tanga and Arusha will be reopened and upgraded to the same standard

Critical Factors for Success:

The most critical issue is to develop a new business plan for TRL, to serve as a basis for the initial financing, but which will be dependent on the appointment of a resourceful, experienced and professional management team.

Expected Benefits/ Impacts:

The immediate benefit will be the resumption of a reliable and cost competitive rail service, directly benefitting trade with Burundi, the DRC, Rwanda, and to a lesser extent Uganda. The infrastructure upgrade will further increase reliability and serve as an additional incentive for the development of the nickel mining sector in Burundi and north eastern Tanzania. Track upgrading will also allow the transport of heavy abnormal loads for the mining industry – the cost of road transport of heavy equipment within Tanzania is presently prohibitive.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
TRL Infrastructure Upgrade, longer term, 1600km of mainline Dar Mwanza, Taboro - Kigoma	2013	ongoing	350	Yes
TOTAL			350	Yes

No.	INFR-RL-10		2010-2013
Name:	TRL Isaka ICD Development	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	TRL, RAHCO, MIOD, SUMATRA, TTCA		
Related Projects (Donors):	TRL Revival and Concession		

Background/Rationale:

The TRL rail service on the Central Corridor carried virtually all the transit traffic between the port of Dar es Salaam and the land locked countries of Rwanda and Burundi, and also a significant portion of the trade with Uganda and the eastern DRC. There were also block or unit train operations between Dar es Salaam and Isaka. Since the decline of the TRL service over the past seven to eight years, reflected as lack of capacity and unreliability, most of the Central Corridor transit traffic has moved to road transportation, and in respect of Uganda and Rwanda, there has been a major diversion to the Northern Corridor serving the port of Mombasa. In the case of Rwanda, this has resulted in a longer and more expensive route for international trade, and for transit trade via Dar es Salaam, a much more expensive road service.

The business plan for the planned revival of TRL over the next two years will include a target to recapture the Rwanda transit traffic as a multimodal service – by rail between Dar es Salaam and Isaka, about 900 km, and by road between Isaka and Kigali, about 460 km. This will require road / rail transshipment to be carried out at Isaka, and it was previously planned to have a fully equipped ICD to deal with this, but implementation has been delayed because of the decline in the rail service and the lack of financing. The transshipment facility at Isaka will be the weakest point in the multimodal service, where most of the time could be lost, if the facility is not adequately equipped and managed, and also fully coordinated with the rail service. The development of the Isaka ICD should be promoted by TRL as a railway services marketing drive, to serve Rwanda and north eastern region of Tanzania, including the rapidly developing mining sector, as well as parts of Eastern DRC close to Rwanda.

Current Status:

TRL is in an interim phase with no ability to finance new projects until a new management team has developed a new business plan to support new investment. A fully equipped ICD at Isaka is likely to be an important element of the TRL business plan, whether or not it is directly finance and operated by TRL. This could be developed by the private sector, but subject to performance commitments from TRL

Description/ Major Components:

The construction of a new ICD, capable of handling full TRL unit trains of about thirty wagons in the initial phases, ideally with loading and unloading of containers by RMGs, alternatively forklifts in the first phase, provision of large paved container storage areas, equipped with reach stacker(s), truck parking and access, fueling points (service station), administration block, telecommunications, possible ware housing and accommodation with cargo distribution and consolidation services. Initial requirement about 10 ha, phased development (could be similar to the small Kidatu ICD which links the TRL and TAZARA railways, which was fully equipped, also with ware housing, and a reach stacker)

Critical Factors for Success:

Firstly, the revival of the TRL rail service as a reliable and cost competitive transport service, ideally operating scheduled unit train service between Dar es Salaam and Isaka. The efficient transfer between road and rail is critical for the multimodal service to be competitive with the alternative all road service. Service contracts should be concluded between TRL, the ICD operator (if not TRL), and the road haulers. A performance commitment from TRL will be essential for the success of the Isaka ICD

Expected Benefits/ Impacts:

A fully equipped and efficiently managed ICD at Isaka will assist TRL to recapture the Rwanda transit traffic lost to the road services and the Northern Corridor route. The capture of the traffic is very important for the sustainability of TRL operations. This will in turn benefit Rwanda, parts of Tanzania and DRC for lower transport cost and reduced road maintenance costs.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
TRL ISAKA Inland Intermodal Container Depot (Terminal)	2011	2 years	25	Yes
TOTAL			25	Yes

No.	INFR-RL-11		2010-2013
Name:	Reconstruction of the Tororo – Gulu – Pakwach Railway	**Action Plan Period:**	
Mode or Subject Area:	Rail	**Intervention Type:**	Capital, PPP
Corridor:	Northern Corridor	**Country(ies):**	Uganda
Agencies Involved:	Uganda Ministry of Transport, Uganda Railways Ltd, RVR		
Related Projects (Donors):	RVR railway upgrading, Uganda and Kenya (private sector), oil sector development Uganda.		

Background/Rationale:

The northern railway from Tororo in Uganda, through Gulu to Pakwach, was completed in 1964, a total distance of about 500 km. Due to several periods of conflict in northern Uganda, and the and the decline of traffic levels, the line was closed, and all freight traffic diverted to road. The security situation in northern Uganda has improved, and this route now provides the main conduit for international trade with southern Sudan (more than 200, 000 tpa through Mombasa in Kenya). In addition, the development of the Uganda oil sector in the region served by the northern railway will require significant imports of equipment and materials, and the possibility of crude oil exports of up to an estimated 7 mtpa by rail.

Current Status:

The feasibility study for reopening the railway to Gulu and Pakwach has been completed (not yet seen by the consultants) and the RVR railway concession agreement has been expanded to include the northern line. Proposals have also been considered by the Ugandan and south Sudanese governments for upgrading the line from Tororo to Gulu to standard gauge (400 km) and extending the railway from Gulu to Juba in southern Sudan (250 km), to serve as an alternative route to the proposed Juba to Lamu standard gauge railway. This is likely to be a long term project, but the reopening of the existing line is considered to be a short term priority.

Description/ Major Components:

Upgrading of the existing northern railway, approximately 500 km, from the current 25 kg/m rail to +40 kg/m track, 20 t axle loads, with possible realignment in sections in order to increase operating speeds. This will include strengthening of bridges and culverts, lengthening of passing loops, and provision for later upgrading to a standard gauge specification (three rail system). RVR is the designated operator. Estimated cost in the region of US$400, depending on the recommendation of the feasibility study. This could be implemented as a phased PPP project.

Critical Factors for Success:

The success of the project will in the first instance depend on the financial and political support from the Ugandan government, and also the ability of the rail concessionaire to enter into a long term contract with the key investors in the Uganda oil sector – for both inputs and outputs

Expected Benefits/ Impacts:

Given the location of the initial productive oil wells in the northern region of Lake Albert, the reconstruction and upgrading of the northern railway is considered essential, and could well provide the much needed anchor project for the revival of the regional rail transport sector as a whole. It will also provide improved and

lower cost access north west Uganda, with likely political and security benefits, and will provide an improved trade route with southern Sudan through Nimule.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Reopening and upgrading of the Tororo – Gulu Pakwach railway	2011	2 years	325	Yes
TOTAL			325	Yes

No. Name:	INFR-RD-01 Central Corridor Road Capacity Upgrades	**Action Plan Period:**	2010-2013 and 2013-2016
Mode or Subject Area:	Road	**Intervention Type:**	Infrastructure
Corridor:	Central Corridor	**Country(ies):**	Burundi, Rwanda, Tanzania
Agencies Involved:			
Related Projects (Donors):			

Background/Rationale:

Analysis by Aurecon of road capacities using First Order Network Assessment (FONA) has determined Level of Service (LOS) for the EAC road network, with indices ranging from A (for best operating conditions) to F (for worst operating conditions). The best operating conditions entail free flow high (design) average speeds and able to overtake easily. Analysis was carried out for base and future (2020) scenarios. Immediate remedial action, in terms of proving additional capacity principally by adding lanes (e.g. climbing lanes or extra lane(s) for the whole identified length) has been recommended for roads with LOS E and F. Roads with LOS D and C are to be investigated for remedial action later, estimated from 2014. The Central Corridor roads that are shown on the list below fall into these categories.

Current Status:

There are already plans to expand capacity of some of roads listed below. However implementation of the comprehensive program of road capacity upgrades as proposed below needs to be pursued expeditiously in order to ensure there is adequate capacity for smooth flow of growing traffic and trade along the roads.

Description/ Major Components:

(1) Projects preparation to bankable stage; (2) mobilizing investment; and (3) construction

Critical Factors for Success:

(1) Commitment and ability of the various authorities under which the proposed roads fall to manage preparation of bankable projects; and (2) availability of finance for project preparation and for actual construction

Expected Benefits/ Impacts:

Impact will be facilitation or removal of potential impediment to regional trade and economic growth. Benefits are as indicated in the table below in terms of EIRR for each proposed road section.

Costs and Other Data:

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)	EIRR %	PPP Potential
Bujumbura – Gitega	Burundi	2011	6	1.1	2	No
Kibungo - Kigali	Rwanda	2014	32	6.7	27	No
Dar es Salaam - Mbezi	Tanzania	2014	25	5.1	27	No
Dar es Salaam port access bypass (to Mlandizi) New constr.	Tanzania	2014	75	40.0	95	Yes
Dodoma - Arusha (Dodoma feeder)	Tanzania	2014	51	8.8	37	No
TOTAL			189	61.7		

No. Name:	INFR-RD-02 Central Corridor Road Rehabilitation	**Action Plan Period:**	2010-2013 and 2013-2016
Mode or Subject Area:	Road	**Intervention Type:**	Infrastructure
Corridor:	Central Corridor	**Country(ies):**	Burundi, Rwanda, Tanzania
Agencies Involved:			
Related Projects (Donors):			

Background/Rationale:

The condition of the East Africa Northern and Central Corridors road network was comprehensively assessed in 2010 to determine the level of deterioration of pavement. HDM derived International Road Indices (IRI) were established for all roads, ranging from 0 (good) to 20 (very poor). Paved roads with roughness levels between 2 and 6 IRI were classified to be in considerable sound state requiring no immediate remedial action, but with the assumption that they will receive routine and periodic maintenance in time to maintain conditions so as not to impact on productive capacity of the road.

Paved roads with roughness levels between IRI 6 and 10 were classified to be approaching severe state or "warning state", requiring rehabilitation within next five years. Paved roads with roughness levels above 10 IRI were categorized as being in severe condition, requiring immediate rehabilitation. The Table below shows Central Corridor roads in the latter two categories, with those in severe condition programmed for rehabilitation within the following four years and those in warning condition planned for rehabilitation from 2014.

Current Status:

There are already plans to rehabilitate some of roads listed below. However implementation of the comprehensive program of road capacity upgrades as proposed below needs to be pursued expeditiously in order to secure road conditions that will facilitate smooth flow of growing traffic and trade along the corridors.

Description/ Major Components:

(1) Projects preparation to bankable stage; (2) mobilizing investment; and (3) construction.

Critical Factors for Success:

(1) Commitment and ability of the various authorities under which the proposed roads fall to manage preparation of bankable projects; and (2) availability of finance for project preparation and for actual construction.

Expected Benefits/ Impacts:

Impact will be facilitation or removal of potential impediment to regional trade and economic growth. Benefits are as indicated in the table below in terms of EIRR for each proposed road section.

Costs and Other Data:

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)	EIRR %	PPP Potential
Bubanza - Cyangugu/Bukavu	Burundi	2011	77	32.3	31	No
Muyinga – Kanazi	Burundi	2011	27	18.9	36	No
Kigali - Ruhengeri	Rwanda	2014	98	41.2	28	No
Nyamahale - Kigali	Rwanda	2014	154	64.7	20	No
Dar es Salaam and surroundings	Tanzania	2014	28	19.6	36	No
Isaka and surroundings	Tanzania	2014	29	20.3	22	No
Chalinze - Tanga: (Coastal feeder)	Tanzania	2014	170	71.4	72	No
Butare - Cyangugu/Bukavu	Rwanda	2014	149	62.6	39	No
TOTAL			732	331.0		

No.	INFR-RD-03		2013-2016
Name:	Central Corridor Upgrade to Paved	**Action Plan Period:**	
Mode or Subject Area:	Road	**Intervention Type:**	Infrastructure
Corridor:	Central Corridor	**Country(ies):**	Tanzania, Burundi
Agencies Involved:			
Related Projects (Donors):			

Background/Rationale:

CDS/Nathan Inc, Aurecon and Louis Berger assessment of the East Africa road network has determined that 3,600 km of regional roads are gravel surface on which vehicles operate with huge economic consequences (of high cost and consequent lack of facilitation of trade and thus economic growth). In order to reduce the high economic cost there is need to upgrade them, especially those with relatively high traffic levels. Among these are 774 km on the Central Corridor. Given the level of traffic on the concerned roads, there is need to upgrade them in the medium to long term. Consequently, the table below lists roads of 774 km on the Central Corridor that are recommended for upgrade to paved standard from 2014.

Current Status:

There are plans to upgrade some of roads listed below. However implementation of the comprehensive program of road upgrades from gravel to paved standard as proposed below needs to be pursued timely to mitigate the economic cost and unlocking further economic opportunities.

Description/ Major Components:

(1) Projects preparation to bankable stage; (2) mobilizing investment; and (3) construction.

Critical Factors for Success:

(1) Commitment and ability of the various authorities under which the proposed roads fall to manage preparation of bankable projects; and (2) availability of finance for project preparation and for actual construction.

Expected Benefits/ Impacts:

Impact will be facilitation or removal of potential impediment to regional trade and economic growth. Benefits are as indicated in the table below in terms of EIRR for each proposed road section.

Costs and Other Data:

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)	EIRR %	PPP Potential
Mwanza and surroundings	Tanzania	2014	14	11.8	32	No
Biharamulo and surroundings	Tanzania	2014	67	46.9	23	No
Bujumbura – Gitega - Muyinga	Burundi	2014	149	104.3	63	No
Nyakanazi - Biharamulo	Tanzania	2014	72	50.4	21	No
Nzega - Isaka	Tanzania	2014	55	38.5	43	No
Dodoma – Kalema (Dodoma feeder)	Tanzania	2014	167	116.9	177	No
Iringa - Dodoma (Dodoma feeder)	Tanzania	2014	182	127.4	75	No
Kalema - Arusha (Dodoma feeder)	Tanzania	2014	68	47.6	115	No
TOTAL			774	543.8		

No. Name:	INFR-RD-04 Northern Corridor Capacity Upgrades	**Action Plan Period:**	2010-2013 and 2013-2016
Mode or Subject Area:	Road	**Intervention Type:**	Infrastructure
Corridor:	Northern Corridor	**Country(ies):**	Burundi, Kenya, Uganda, Rwanda
Agencies Involved:			
Related Projects (Donors):			

Background/Rationale:

Analysis by Aurecon of road capacities using First Order Network Assessment (FONA) has determined Level of Service (LOS) for the EAC road network, with indices ranging from A (for best operating conditions) to F (for worst operating conditions). The best operating conditions entail free flow high (design) average speeds and able to overtake easily. Analysis was carried out for base and future (2020) scenarios. Immediate remedial action, in terms of proving additional capacity principally by adding lanes (e.g. climbing lanes or extra lane(s) for the whole identified length) has been recommended for roads with LOS E and F. Roads with LOS D and C are to be investigated for remedial action later, estimated from 2014. The Northern Corridor roads that are shown on the list below fall into these categories.

Current Status:

There are already plans to expand capacity of some of roads listed below. However implementation of the comprehensive program of road capacity upgrades as proposed below needs to be pursued expeditiously in order to ensure there is adequate capacity for smooth flow of growing traffic and trade along the roads.

Description/ Major Components:

(1) Projects preparation to bankable stage; (2) mobilizing investment; and (3) construction.

Critical Factors for Success:

(1) Commitment and ability of the various authorities under which the proposed roads fall to manage preparation of bankable projects; and (2) availability of finance for project preparation and for actual construction.

Expected Benefits/ Impacts:

Impact will be facilitation or removal of potential impediment to regional trade and economic growth. Benefits are as indicated in the table below in terms of EIRR for each proposed road section.

Costs and Other Data:

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)	EIRR %	PPP Potential
Bujumbura - Kayanza	Burundi	2011	8	1.6	7	No
Athi River Sorroundings	Kenya	2011	16	6.5	56	No
Eldoret - Bungoma	Kenya	2011	104	14.5	117	No
Molo - Eldoret	Kenya	2011	127	17.7	157	No
Mombasa - Voi	Kenya	2011	57	9.9	189	No
Voi - Kitui Rd Junction	Kenya	2011	135	18.8	239	No
Fort Hall - Embu - Isiolo: (Moyale-Dodoma Spur)	Kenya	2011	99	17.3	42	No
Fort Hall - Nyeri: (Moyale- Dodoma Spur)	Kenya	2011	40	8.3	23	No
Kajiado - Namanga - Arusha: (Moyale-Dodoma Spur)	Kenya	2011	32	6.7	76	No
Thika - Garissa: (Fe (Moyale- Dodoma Spur)	Kenya	2011	27	7.6	31	No
Bungoma/Eldoret Rd junction - Kakamega: (Lokichogio Spur)	Kenya	2011	41	8.4	22	No
Eldoret - Kitale: (Lokichogio Spur)	Kenya	2011	53	9.1	40	No
Kakamega - Kisumu: (Lokichogio Spur)	Kenya	2011	49	10.3	27	No
Kisii and surroundings: (Lokichogio Spur)	Kenya	2011	166	23.2	31	No
Kisumu and surroundings(Lokichogio Spur)	Kenya	2011	46	9.5	26	No
Kitale and surroundings (Lokichogio Spur)	Kenya	2011	21	4.3	22	No
Kampala - Masaka - Mbarara	Uganda	2011	104	19.1	53	No
Kampala & surroundings (50 percent Jinja-Kampala):	Uganda	2011	81	14.1	45	No
Tororo - Bugiri - Jinja	Uganda	2011	31	6.3	47	No
Kakamega - Kitale (Lokichogio spur)	Kenya	2014	42	8.8	37	No
Byumba - Kigali	Rwanda	2014	27	5.6	20	No
Kakitumba and surroundings	Rwanda	2014	28	5.7	34	No
Jinja - and surroundings	Uganda	2014	5	1.2	16	No
TOTAL			1,339	234.5		

No.	INFR-RD-05	**Action Plan**	2010-2013 and
Name:	Northern Corridor Road Rehabilitation	**Period:**	2013-2016
Mode or Subject Area:	Road	**Intervention Type:**	Infrastructure
Corridor:	Northern Corridor	**Country(ies):**	Tanzania, Kenya, Uganda
Agencies Involved:			
Related Projects (Donors):			

Background/Rationale:

The condition of East Africa Northern and Central Corridors road network was comprehensively assessed in 2010 to determine the level of deterioration of pavement. HDM derived International Road Indices (IRI) were established for all roads, ranging from 0 (good) to 20 (very poor). Paved roads with roughness levels between 2 and 6 IRI were classified to be in considerable sound state requiring no immediate remedial action, but with the assumption that they will receive routine and periodic maintenance in time to maintain conditions so as not to impact on productive capacity of the road.

Paved roads with roughness levels between IRI 6 and 10 were classified to be approaching severe state or "warning state", requiring rehabilitation within next five years. Paved roads with roughness levels above 10 IRI were categorized as being in severe condition, requiring immediate rehabilitation. The Table below shows Northern Corridor roads in the latter two categories, with those in severe condition programmed for rehabilitation within the following four years and those in warning condition planned for rehabilitation from 2014.

Current Status:

There are already plans to rehabilitate some of roads listed below. However implementation of the comprehensive program of road capacity upgrades as proposed below needs to be pursued expeditiously in order to secure road conditions that will facilitate smooth flow of growing traffic and trade along the Northern Corridor.

Description/ Major Components:

(1) Projects preparation to bankable stage; (2) mobilizing investment; and (3) construction.

Critical Factors for Success:

(1) Commitment and ability of the various authorities under which the proposed roads fall to manage preparation of bankable projects; and (2) availability of finance for project preparation and for actual construction.

Expected Benefits/ Impacts:

Impact will be facilitation or removal of potential impediment to regional trade and economic growth. Benefits are as indicated in the table below in terms of EIRR for each proposed road section.

Costs and Other Data:

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)	EIRR %	PPP Potential
Mwanza - Sirari/Kisii: Rehabilitation	Tanzania	2011	239	100.4	38	No
Kisumu - Kakamega:(Lokichogio spur)	Kenya	2014	94	39.5	36	No
Tororo - Jinja: Rehabilitation	Uganda	2014	151	63.4	120	No
Kampala - Kabale: Rehabilitation	Uganda	2014	380	159.6	74	No
TOTAL			864	362.9		

No. Name:	INFR-RD-06 Northern Corridor Upgrade to Paved	**Action Plan Period:**	2010-2013
Mode or Subject Area:	Road	**Intervention Type:**	Infrastructure
Corridor:	Northern Corridor	**Country(ies):**	Burundi
Agencies Involved:			
Related Projects (Donors):			

Background/Rationale:

CDS/Nathan Inc, Aurecon and Louis Berger assessment of the East Africa road network has determined that 3,600 km of regional roads are gravel surface on which vehicles operate with huge economic consequences (of high cost and consequent lack of facilitation of trade and thus economic growth). In order to reduce the high economic cost there is need to upgrade them, especially those with relatively high traffic levels. Among these are 319 km on the Northern Corridor. Given the level of traffic on the concerned roads, there is need to upgrade them in the medium to long term. Consequently, the table below lists roads of 319 km on the Northern Corridor that are recommended for upgrade to paved standard from 2014.

Current Status:

There are plans to upgrade some of roads listed below. However implementation of the comprehensive program of road upgrades from gravel to paved standard as proposed below needs to be pursued timely to mitigate the economic cost and unlocking further economic opportunities.

Description/ Major Components:

(1) Projects preparation to bankable stage; (2) mobilizing investment; and (3) construction.

Critical Factors for Success:

(1) Commitment and ability of the various authorities under which the proposed roads fall to manage preparation of bankable projects; and (2) availability of finance for project preparation and for actual construction.

Expected Benefits/ Impacts:

Impact will be facilitation or removal of potential impediment to regional trade and economic growth. Benefits are as indicated in the table below in terms of EIRR for each proposed road section.

Costs and Other Data:

Component	Country	Invest. Start Year	Dist. (km)	Cost (US$ million)	EIRR %	PPP Potential
Bujumbura -Gitega – Muyinga	Burundi	2011	149	104.3	63	No
Nairobi and surroundings	Kenya	2014	56	23.5	117	No
Nakuru- Londiani	Kenya	2014	114	15.9	108	No
TOTAL			319	143.7		

No.	INFR-L-01		2010-2013
Name:	Lake Ports Rehabilitation, Dredging and Siltation Protection	**Action Plan Period:**	
Mode or Subject Area:	Lakes	**Intervention Type:**	Infrastructure
Corridor:	Northern and Central Corridors	**Country(ies):**	Burundi, Kenya, Tanzania, Uganda and DRC
Agencies Involved:	Ports Authorities, Government Ministries of Transport		
Related Projects (Donors):	Belgium		

Background/Rationale:

Historically inland waterways on Lake Tanganyika have played an important role in proving least cost, most efficient and reliable means of transport for goods to/from Burundi, Eastern DRC and western Tanzania, as an important component of an intermodal supply chain along the Central Corridor linking these countries to Dar es Salaam port through Kigoma. Similarly inland waterways on Lake Victoria provided an important link for the Central and Northern Corridor transport intermodal system links to especially Uganda. In this way the Lake provided Uganda with an alternative access route to the sea.

This importance has declined due mainly to backlog maintenance or lack of investments in the ports and marine infrastructure. Insecurity on Lake Tanganyika and the decline in performance of rail links to Kigoma, Mwanza and Kisumu has also denied the lake services with traffic that would have motivated such investment. Many ports are severely silted, with depths at Berths reduced to around 3-4 m. Port facilities have also deteriorated. However, with better prospects of economic growth in the region, it is important that these links are revived and strengthened. Investment in rehabilitating and improving Lake ports infrastructure and shipping services will be beneficial to the region.

Since traffic is low and needs to develop, it is proposed that initially a relatively cheaper tug and barge based roll on roll off (RoRo) system should be developed on both lakes to provide necessary capacity until cargo traffic builds up to justify more expensive lift on lift off system.

Current Status:

Dredging at some ports on Lake Tanganyika and Victoria has been done or is ongoing, with own funding (TPA) and assistance from Belgium. There are two major initiatives the Lake Victoria Basin Commission (LVBC) and the Lake Tanganyika Basin Commission (LTBC) that are ongoing and have established comprehensive investment strategies. In this an investment conference for LBVC was held in Mwanza on mobilizing finance for implementation.

Description/ Major Components:

(1) Complete or initiate dredging of ports of especially Kigoma, Bujumbura, Kalemie, Mwanza, Port Bell, and Kisumu to restore design depths of generally around 6 m on approach to, in anchorage and along Berths. (2) Establish a watercourse management system to minimize soil erosion and sedimentation at ports and (3) rehabilitating or establishing of areas and ramps to accommodate vehicles (in particular MAFI trailers and forklifts) involved with RoRo operations at ports.

Critical Factors for Success:

(1) Redevelopment of railways links to Kigoma, Mwanza and Kisumu to entice shippers; (2) Governments of especially Tanzania, Kenya, Uganda, Burundi (and DRC) commitment to invest or mobilize finance for

investment and (3) establishing suitable condition to allow PPP especially private sector investment in provision of Lake services..

Expected Benefits/ Impacts:

(1) Providing opportunity to reduce transport/trade cost with the use of least cost links for especially for Burundi, part of Eastern DRC and Uganda; (2) Providing viable alternative trade routes for countries using the Lake services to avoid propensity to exploit monopoly situations,

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Dredging and sedimentation protection at ports of Bujumbura, Kigoma, Kalemie, Mwanza, Port Bell and Kisumu	2010	30 months	8	No
Rehabilitate or construct Ports infrastructure facilities (paved storage areas, ramps etc) to handle RoRo services	2011	24 months	6	Yes
TOTAL			14	Yes

No. Name:	INFR-L-02 Establishing and Provision of RoRo services on Lakes Tanganyika and Victoria	**Action Plan Period:**	2010-2013
Mode or Subject Area:	Lakes	**Intervention Type:**	Infrastructure
Corridor:	Northern and central Corridor	**Country(ies):**	Burundi, DRC, Kenya, Uganda and Tanzania
Agencies Involved:	Private Sector Lakes Service Providers, Lakes Ports Authorities, Governments, Regulators		
Related Projects (Donors):			

Background/Rationale:

In the course of revival of inland waterway services on Lakes Tanganyika and Victoria to service increasing volume of cargo, it has been proposed to initially adopt a tug and barge based RoRo services. These would be quicker and relatively less costly to establish. Typically a tug and barge system also requires about a third of the crew compared to a self propelled vessel. Furthermore, barges can be built at low technology shipyards on the lakes, tugs can be bought and railed to the lakes, MAFI trailers can be assembled and fabricated locally and forklifts can be bought from local franchises.

Current Status:

There are some private sector operated barges on both Lake Tanganyika and Victoria. Barges can be built at existing shipyards at some ports on both lakes, albeit with some slight improvement if need be.

Description/ Major Components:

(1) Mobilizing private sector, especially those involved in provision of lake services, to buy into and establishing RoRo services; (2) acquisition of barges by fabrication at local shipyards, MAFI trailers also fabricated locally and importation of tugs.

Critical Factors for Success:

(1) Private Sector being convinced the RoRo services are good business; (2) Availability of appropriate port infrastructure to service RoRo traffic and (3) a requisite regulatory environment to allow fair competition among service providers.

Expected Benefits/ Impacts:

(1) Provision of transport capacity on the lakes quickly; (2) provision of an opportunity to reduce transport and trade cost in the Great Lakes region by exploiting relatively cheaper inland waterways.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Acquisition of barges, tugs, MAFI trailers and fork-lifts and operate RoRo services on Lakes Tanganyika and Victoria	2011	24	15	Yes
Support process to promote and facilitate establishment of RoRo services on Lakes Tanganyika and Victoria	2011	24	0.4	Yes but mostly public/ donor finance
TOTAL			15.4	Yes

No.	INFR-L-03		2010-2013
Name:	Restructuring Wagon Ferries to carry MAFI Trailers	**Action Plan Period:**	
Mode or Subject Area:	Lakes	**Intervention Type:**	Infrastructure
Corridor:	Northern and Central Corridors	**Country(ies):**	Kenya, Uganda and Tanzania
Agencies Involved:	RVR, RAHCO/TRL. TMSC and Lake Ports authorities		
Related Projects (Donors):			

Background/Rationale:

Principal cargo transport services on Lake Victoria were designed as part of a railway system, with wagon ferries carrying wagons across the Lake. Link spans were built at all major ports Mwanza, Kemondo Bay and Musoma in Tanzania, Kisumu in Kenya and Jinja and Port Bell in Uganda to facilitate rolling wagons on/off the ferries. When the railways were performing well the wagon ferries had an important role to provide an important transport link for both Northern and Central Corridors. However, with the near collapse of the railways in recent years the importance and use of wagon ferries declined and the ferries received no proper maintenance.

Out of the five ferries commissioned between 1964 and 1979, only four are serviceable or operational since the sinking of one (Ugandan) in 2005 after collision with a sister ferry. Two (Tanzanian and Kenyan) are operational and the remaining two (Ugandan) are being rehabilitated to be put back to service. This RoRo service is simple to operate and available to use, though some facilities at ports need rehabilitation. However, there is need to reduce the high cost of maintenance and operations of the ferries relative to their carrying capacity. They now carry nineteen wagons (38 TEU).

A 2009 analysis by Marine Logistics Limited for the Central Development Corridor determined the possibility of the ferries accommodating 62 TEU, an additional 24 TEU on MAFI trailers and on deck, without changing the structure of the vessel. There is a possibility to further improve this capacity by adjusting the superstructure to make the ferry more flexible, with ability to carry a full load of MAFI trailers when there are wagons to ferry. In addition the MAFI trailers have a tare weight of around five tonnes compared to seventeen tonnes for the wagons.

Current Status:

There are no known existing plans to convert the wagon ferries.

Description/ Major Components:

(1) The first part will be to carry out a technical feasibility analysis of the conversion, especially related to stability and safety standards; and (2) carrying out the conversions at local shipyards.

Critical Factors for Success:

(1) The first factor will be establishing technical feasibility (although some experts have suggested feasibility); and (2) acceptance by the owners and operators of the wagon ferries to convert them and provide broader, flexible and potentially more competitive RoRo services.

Expected Benefits/ Impacts:

The main advantage is better utilization of the wagon ferries and, thus, potential reduction of operational cost.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)	PPP Potential
Analysis of technical feasibility of converting wagon ferries to carry MAFI trailers and actual conversion of four wagon ferries	2011	16	7	Yes
TOTAL			7	Yes

No.	OPER-RD-01		2011-2012
Name:	Improved Vehicle Overload Control System	**Action Plan Period:**	
Mode or Subject Area:	Road	**Intervention Type:**	Technical Assistance
Corridor:	Northern & Central Corridor	**Country(ies):**	All
Agencies Involved:	National Roads Authorities, Ministries of Transport, Works and/or Infrastructure, Transport Regulators, Traffic Police		
Related Projects (Donors):	JICA		

Background/Rationale:

Art 90(l) of the EAC Treaty commits the partner states to: *adopt common rules and regulations governing the dimensions, technical requirements, gross weight and load per axle of vehicles used in trunk roads within the Community*. Under the guidance of the EAC Secretariat and with donor support, partner states reached agreement in July 2008 on the harmonization of axle mass loads, gross vehicle mass limits, the adoption of a formula for the protection of bridges and tolerance factors for overloads (i.e. grace percentages which do not attract penalties). Agreement was also reached to ban quadrem axles and to decriminalize overloading by adopting a system of administrative penalties to recover the economic cost of damage inflicted by overloaded vehicles.

All states are making major investments in improving road infrastructure, including in some cases, contracting for road management by private firms. Effective overload control is essential to extract maximum economic benefit from this investment. Investment in railway systems is also ongoing and the ability of rail to compete effectively with road transport also depends – significantly - on effective measures to combat overloaded trucks.

Current Status:

Despite the agreement reached in 2008, there has been little progress by Member States in amending their legislation to adopt the harmonized regional standards. Moreover, only Tanzania has introduced the agreed system of administrative penalties based on the recovery of actual economic costs of road damage.

Existing overloading control strategy is aimed at achieving one hundred percent inspection of all commercial vehicles. There is no targeted risk management approach and no incentive to encourage truckers to self-regulate. The high intensity of checking increases journey times and provides an added incentive for corruption. Differences in national limits complicate cross-border operations. There is also no regional consistency in terms of the frequency of checks as some states (Burundi, Rwanda) have no existing weighbridge infrastructure.

Description/ Major Components:

Technical assistance is initially required to assist member states to align legislation on vehicle limits with regional standards and to pass new regulations providing for administrative penalties. All states need to revise legislation to adopt the regional limits, although Tanzania has already adopted new rules providing for administrative penalties.

Experience elsewhere has highlighted that the efficacy of overload controls is improved when the trucking industry is fully cognizant of the content of the new rules and their application. Outreach activities to sensitize the trucking industry to the implications of the new rules are useful to ensure smooth implementation of the administrative system and to secure the co-operation of industry – from an early stage – to improve

compliance levels. At the same time, training of weighbridge staff and law enforcement officers in the implementation of the new rules is also needed. Provision therefore needs to be made to conduct workshops and information sessions with the trucking industry (once legislation is finalized) and to hold practical training sessions with weighbridge personnel and enforcement personnel.

In the longer term, technical assistance can be extended to develop a regional overloading control strategy which utilizes targeted enforcement techniques based on risk management. This includes focusing on specific vehicles and cargo types prone to overloading, establishing databases to develop profiles of frequent offenders and adopting additional enforcement measures to target high-risk truckers. Additionally, measures to encourage self-regulation, such as the accreditation of compliant truckers who qualify for more lenient treatment based on their compliance records, can be introduced.

Critical Factors for Success:

Co-operation by line function ministries and Attorney-Generals' Chambers to process legislation is a critical precondition for success. Without a legislative basis, the remaining components of the technical assistance cannot be implemented.

Expected Benefits/Impacts:

The major benefit expected from the proposed intervention is to significantly improve levels of compliance. The reduced incidence of overloading will also extend pavement life and hence improve the economic return on the investment in road infrastructure. Improved compliance will also secure greater safety benefits by reducing the incidence of traffic accidents caused by overloading. Lastly, transport operations on the corridor will be facilitated by the existence of a harmonized regulatory framework.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Legislative harmonization	2011	6 months	0.5
Trucking industry outreach and sensitization	2011-2	2 months	0.1
Training: weighbridge personnel, law enforcers	2011	3 months	0.3
TOTAL			0.9

No. Name:	OPER-RD-02 Implement Tripartite Agreement on Road Transport and Harmonize Road Transport Policy by Adopting EAC Road Transport & Traffic Act	**Action Plan Period:**	2011 – 2013
Mode or Subject Area:	Road	**Intervention Type:**	Technical Assistance
Corridor:	Northern & Central Corridor	**Country(ies):**	All
Agencies Involved:	Ministries of Transport, Transport Regulators, Traffic Polices		
Related Projects (Donors):	World Bank		

Background/Rationale:

The EAC treaty commits Partner States to implementing a common road transport policy (Art 90). The EAC States have partially given effect to this commitment by concluding the Tripartite Agreement on Road Transport in 2001. The Tripartite Agreement provides a common framework for regulating cross-border road transport and introduces a variety of facilitation measures to improve operational efficiencies. To date, the Tripartite Agreement has not yet been implemented, mainly due to the absence of enabling domestic laws. Moreover, states are still individually pursuing national policies with objectives which are at times in conflict with their commitments under the Treaty. These result in low utilization of transport vehicles and, thus, higher transportation cost.

The commitments under the EAC Treaty include harmonising the provisions of their laws on traffic and licensing, establishing common measures for the facilitation of road transit traffic, adopting common and simplified procedures for road transport documentation and harmonising road transit charges, reducing and eliminating non-physical barriers to road transport, ensuring that common carriers from other Partner States have the same opportunities and facilities as common carriers in their territories in the undertaking of transport operations within the Community; ensuring that the treatment of motor transport operators engaged in transport within the Community from other Partner States is not less favourable than that accorded to the operators of similar transport from their own territories and making road transport efficient and cost effective by promoting competition and introducing regulatory framework to facilitate the road haulage industry operations.

Current Status:

Domestic road transport policies in all states are aimed at deregulated market access, which has had some positive effects, but the lack of qualitative regulation has also had several undesirable consequences. These include low entry barriers leading to cut throat competition, low safety levels and poor service quality. Operational standards need to be improved and governments need to align their policies to encourage the growth of a professional transport industry which is able to compete effectively within a framework of clearly-defined rules and appropriate regulation.

National policies do not, as yet, prioritize regional commitments appropriately which partially underlies the failure of governments to implement the Tripartite Agreement. Non-implementation of the Agreement carries a significant opportunity cost, as the potential cost savings and efficiency improvements envisaged by the Agreement are not captured. Road transport operations on the corridors remain constrained by conflicting national rules and prone to new non-physical barriers.

Description/ Major Components:

Technical assistance is required in two phases. Short term assistance is required to support EAC states to implement the Tripartite Agreement. This is required to:

- Revise existing legislation and adopt new legislation to domesticate the Agreement in the national laws of the member states;
- Design licence application, adjudication and issuing procedures and forms;
- Design license administration software systems and procure hardware;
- Train personnel in the handling of applications, adjudication and issuing;
- Train law enforcers in the application of on-the-road enforcement of the rules under the Agreement;
- Develop transport supply and demand capacity to manage competition between carriers from different states; and
- Undertake monitoring and evaluation.

Medium assistance is required to help EAC states align their road transport policies and implement complementary regulatory policies for national and international transport. Such policies and regulations must be aimed at developing a professional road transport industry characterized by a progressive improvement in quality and safety standards. Technical assistance is likely to be required to:

- Design the features of the policy/ regulatory system through a process of stakeholder consultation;
- Develop an appropriate institutional framework;
- Draft an EAC Road Transport and Traffic Act and implementing regulations;
- Define standards for access to the road transport profession;
- Develop procedures for evaluating applicants and issuing operator licenses;
- Design support software and procure hardware to operate a multi-module database;
- Conduct training of regulatory and law enforcement personnel; and
- Undertake monitoring and evaluation.

Critical Factors for Success:

Due to the multilateral nature of the Tripartite Agreement, successful implementation depends on comparable levels of commitment from all Partner States. Similarly, national measures need to be coordinated to ensure that progress is synchronized in all states to ensure concurrent implementation.

Expected Benefits/Impacts:

Multilateral arrangements similar to the Tripartite Agreement have delivered proven benefits elsewhere (e.g. Southern Africa) in terms of improved transport efficiencies and competition, reduced costs, etc. Similar benefits can be expected to be derived from implementation of the Agreement in East Africa.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Preparation of domestic laws incorporating Tripartite Agreement in all partner states	2011	6 months	0.25
Procedures development/ software	2011-2	3 months	0.25
Training	2012	3 months	0.25
Implementation support / M&E	2012	6 months	0.25
Support to develop common national road transport policies / drafting of EAC Act	2012-3	6 months	0.5
Implementation support	2013	6 months	0.5

No.	OPER-RL-01		2010-2013
Name:	Procure and Retain TRL Management Team – 2 years	**Action Plan Period:**	
Mode or Subject Area:	Railway	**Intervention Type:**	Technical Assistance
Corridor:	Central Corridor	**Country(ies):**	Tanzania
Agencies Involved:	Ministry of Infrastructure Dev, RAHCO, TRL		
Related Projects (Donors):	Revival of TRL operations, WB funds set aside		

Background/Rationale:

The Tanzania Railways Limited (TRL) serves the land locked countries of Uganda, Rwanda, Burundi and parts of eastern DRC. Traditionally the system carried between 1.2 mtpa and 1.5 mtpa, but in the past six years traffic has fallen to below 0.5 mtpa due to a series of specific events: (i) lack of investment and poor performance of the railways over the period, (ii) the suspension of the Ugandan rail ferry service; (iii) the 2009 flood damage, causing a six month service suspension, and (iv) the failure of the concession with Rites, operating as TRL. The TRL service is particularly critical for Burundi, because it previously carried all Burundi's international trade, which is now routed via a much longer and more expensive road route. The same applies to trade with the eastern DRC through the lake ports of Kigoma and Kalemie.

The TRL service also provides the shortest distance to any port from Rwanda, and the decline of the lake and rail service has resulted in Rwandan transit traffic being shifted from the Central to the Northern Corridor, at additional cost. As a result of the failed concession, the budget allocated for the revival of the system is no longer available. Urgent outside assistance is needed. However, there appears to be little possibility to attract such financial support without ensuring that there are sufficient conditions to ensure value for money. One of the key conditions is a good business plan and a fully experienced and accountable management to implement the plan. Such a management is likely to be a combination of local experts, supported by an experienced and well technically resourced team from a reputable international railway company, with experience of turning around railways and managing successful or profitable railways.

Current Status:

TRL is currently in an interim stage, being managed through RAHCO, with TRL staff salaries being guaranteed by government, but TRL being responsible for all other operating costs. RAHCO has sought financial support through government for a total investment of US$90 million in track repair and upgrades in the first 3 years. There appears to be no possibility for funding future TRL operations without the preparation of a detailed, realistic and credible business plan, which is focused on core business, linked to increasing freight traffic volumes. At the present time, TRL is unable to serve major new customers without additional up front funding to improve the performance of both infrastructure and equipment.

Description/ Major Components:

Phase 1 : Preparation of the TOR for a performance based management contract, working jointly with The MOID and RAHCO, motivation of funding for the management contract (estimated at US$2 million over two years), preparation of tendering process, prequalification, adjudication, preparation of management contract and appointment of management contractor. Technical assistance required, assumed funded by RAHCO with indicated WB support.

Phase 2 : Retain TRL management team for a period of two years, management the operation of TRL, prepare detailed business plans, including cash flows and financing schedule, presentation of business plan to secure funding, prepare and implement marketing plan to target intermodal sector and increase freight levels. Study

option for future operational structure for TRL and prepare contracts for operating concession. The cost of the management contract will require institutional funding through government, est. US$2 million.

Critical Factors for Success:

The closure of the TRL railway service is not considered to be a politically acceptable or realistic option – it could have severe negative economic consequences for the land locked countries. The necessary capital cannot be raised without improved management and a credible business plan. The crucial success factor is therefore the urgent appointment of an experienced management team capable of producing a bankable turn-around business plan.

Expected Benefits / Impacts:

An improved TRL rail service, competitive with road services in respect of cost and reliability (as has existed before), combined with increased capacity, will have direct economic benefits for both Tanzania and the land locked countries of Burundi, DRC, Rwanda, Uganda and Uganda, through increased trade competiveness, for both regional and international trade – lower prices and improved reliability will increase volumes. A shift of freight from road to rail will also provide environmental and safety benefits.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Management contract for TRL, including short term revival, business plan, procurement of funds for revival, preparation of concession process	2011	2 years	2
TOTAL			2

No.	OPER-RL-02			**Action Plan Period:**	2010-2016
Name:	Establish Regional Railway Safety Regulator				
Mode or Subject Area:	Rail		**Intervention Type:**	Operations / Regulatory - TA	
Corridor:	Northern & Central Corridors	**Country(ies):**	Kenya / Uganda / Tanzania		
Agencies Involved:	RVR, Kenya Railways, Uganda Railways, TRL, RAHCO, SUMATRA				
Related Projects (Donors):	RVR and TRL railway Operating Concessions				

Background/Rationale:

The railway systems operating on the Northern and Central Corridors, operating as RVR in Kenya and Uganda and TRL in Tanzania, share a common track gauge of 1,000 mm and similar technical specification in respect of wagon coupling systems. The two operating systems are interconnected with a rail link between Moshi and Voi (Tanzania/Kenya) and by the rail ferry between Mwanza and Port Bell (Tanzania/Uganda), although these interconnector have not been fully functional for some years due to operational difficulties and consequent falling demand. The Kenyan and Ugandan railway system are connected at Malaba and also via the Kisumu – Port Bell rail ferry service, all operated by RVR.

The respective railway safety regulators enforce the provisions of the railway acts in each country in respect of track and equipment condition, operating procedures, including speed restrictions. Speed restrictions and limitations on train lengths are intended to ensure safe operation conditions (prevent derailments). In practice, with each country having its own safety regulator, when trains are moved from one system or country to another, locomotive and train crews are switched. This solves the problem of accountability in the event of an accident.

At the interchange point, the wagons are inspected and those with faults or safety issues are held back. This process is time consuming and disruptive – very often consolidated loads are broken up because of wagon faults, or trains are delayed because of the unavailability of locomotives at the interchange point. A safety regulator which covers all three countries – Kenya, Uganda and Tanzania (and in future Rwanda and Burundi) would allow the operation of seamless train services between the different systems and countries, with joint wagon safety inspections carried out at the points of departure, rather than the interchange points.

There have been discussions of various ways of establishing a common regional regulatory framework. The options considered include having a regional regulator or having a single harmonized or common law and regulation but enforced by individual national judicial jurisdiction since these are not harmonized.

Current Status:

Safety regulation of railway operations fall under the respective ministries of transport in Kenya and Uganda, and under a specialized unit in Tanzania, SUMATRA (Surface and Maritime Transport Authority), which is also responsible for transport economic regulation. There has been no attempt or initiative to set up a regional railway safety regulator, mainly because of the general decline in railway services in both corridors and the problems experienced with both the TRL and RVR railway concessions. However, the RVR revival process is now underway, with the TRL revival being planned, and improved interoperability will be a key success factor.

Description/ Major Components:

A study (TA) to investigate and propose a structure for the establishment and operation of a regional railway safety regulator and the linkages to the various national transport safety regulators. This will be confined to the Northern and Central Corridors only, rather than the EA region, because of the limited geographical coverage of the 1,000 mm gauge system.

Critical Factors for Success:

In the first instance, the desire by the three countries served by the 1,000 mm gauge railway system, to investigate the establishment of a railway safety regulator for the Northern and Central Corridors. The process should be initiated and supported by the railway operators or concessionaires, with the objective of improved performance and flexibility

Expected Benefits/ Impacts:

Improved competitiveness of railway services between adjacent systems and countries – uniform standards and operating procedures, seamless train services with faster transit times and lower operating costs.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Study on Regional railway Safety Regulator Structure	2011	4 months	0.2
TOTAL			.2

No.	OPER-L-01		2010-2013
Name:	Vessel Maintenance Capacity on Lake Tanganyika	**Action Plan Period:**	
Mode or Subject Area:	Lakes	**Intervention Type:**	Operations
Corridor:	Central Corridor	**Country(ies):**	Burundi, Tanzania and DRC
Agencies Involved:	Shipyard Developers and Managers, Port Authorities and Governments		
Related Projects (Donors):			

Background/Rationale:

There are old vessel building and repair facilities (slipway/dry docks) at the ports of Kigoma, Kalemie and Bujumbura, with different capacities and technical capabilities. However, there have been complaints by some vessel operators of inadequate of capacity. In addition complaints have also been made on unfair treatment or discrimination by some owners of these facilities. Furthermore, with the drive to redevelop Lake Services, involving acquisition and deployment of newer vessels, as well as enhance safety standards, there is need to develop adequate capacity to handle vessels building, assembling and repairs. This capacity should also be developed and managed as common user facilities to service vessels from all countries. A strategy to do so needs to be established and implemented.

Current Status:

Each main port (Kigoma, Kalemie and Bujumbura) has some repair facilities managed by respective Port Authorities. An assessment of these facilities is required to determine a strategy for development adequate and integrated vessel repair facilities on the Lake.

Description/ Major Components:

(1) Assessment of ship/vessel repair facilities on Lake Tanganyika and propose a strategy to develop adequate facilities to match future requirements, including an institutional framework to ensure access by vessels irrespective of their country of origin; (2) promote and secure the interest of potential investors and managers of the facilities; (3) improvement/development of the facilities by interested investors/operators.

Critical Factors for Success:

(1) Suitable condition for growth of Lake transport services (sustenance of security and safety and economic growth of the surrounding areas) to create good business prospects for ship building and repairs; and (2) availability of willing investors and managers of ship repair services.

Expected Benefits/ Impacts:

(1) Enhancing of safety through operation of well serviced vessels; (2) creation of local capacity which will better facilitate development of good standard Lake transport services; and (3) creation of jobs for local people.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Assessment of vessel building and repair facilities on Lake Tanganyika to prepare a strategy for developing adequate capacity	2011	6	0.5
Improving/developing and managing vessel repair facilities on Lake Tanganyika	2011	18	1.5
TOTAL			2.0

No.	OPER-L-02				2010-2013
Name:	Enhance Safe Navigation			**Action Plan Period:**	
Mode or Subject Area:	Lakes			**Intervention Type:**	Infrastructure
Corridor:	Northern and Central Corridor	**Country(ies):**	Kenya, Tanzania, Burundi, Uganda and DRC		
Agencies Involved:	Governments, Regulators in each country				
Related Projects (Donors):					

Background/Rationale:

The Lakes do not have up-to-date navigational aids to guide safe sailing of vessels. The certification and licensing of vessels and crew is also not harmonized among the countries allowing ship owners to operate a wide variety of vessels to different standards. Furthermore, there is no credible and effective search and rescue on the Lakes. Given this state there is no credible safety environment on the two Lakes. Partly due to this many avoidable accidents happen and major accidents have resulted in huge losses. The most dramatic accidents include the sinking 30 km off Mwanza port of MV Bukoba, a passenger steamer with capacity of 430. This accident, which occurred in 1996 resulted in the drowning of approximately 800 people. Rescuers were brought in from as far as South Africa. The other major accident was the collision of two wagon ferries in 2005, resulting with the drowning and loss of one of them.

Enhancing safety regulations will create conditions for avoiding some of these accidents and losses.

Current Status:

Safety issues are included in the two main initiatives for the two Lakes: The Lake Victoria Basin Commission (LBVC) and Lake Tanganyika Basin Commission (LTBC) under which comprehensive development and investment strategies are being pursued.

Description/ Major Components:

(1) Undertake/complete hydrographic surveys and install lake-wise and port navigational aids for safe passage of ships; (2) Adopt recognized classification society rules regarding construction of ships/vessels; (3) introduce meteorological navigational warnings and other services; (4) establish search and rescue organization and adopt a harmonized implementation policy and strategy, including the possible use of *Global Maritime Distress Safety System* (*GMDSS*) and (5) harmonize port security, safety and environmental compliance strategies.

Critical Factors for Success:

(1) Commitment to reform from old poor practice by all institutions concerned and (2) availability of technical support.

Expected Benefits/ Impacts:

Major impact is the improvement of safety on the Lakes and major reduction of accidents and loss of property and lives.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Install navigational aids on Lakes Victoria and Tanganyika.	2011	36	2
Establish/improve harmonized safety regulatory regime	2011	20	1
TOTAL			3

No.	OPER-P-01		2010-2013
Name:	Enhancing Port Operation with ICT Applications	**Action Plan Period:**	
Mode or Subject Area:	Port	**Intervention Type:**	Operations
Corridor:	Northern/Central Corridor	**Country(ies):**	Kenya, Tanzania
Agencies Involved:	KPA, TPA		
Related Projects (Donors):	World Bank, DfID, USAID, JICA		

Background/Rationale:

Each procedure in the port can take two to three days. The problem is when they are done consecutively they can take twelve to twenty days. Other delay factors include submitted documents being incomplete, one agency taking paperwork out of the chain so it doesn't get processed, clearing agents/shippers being slow to pay fees and duties, shippers intentionally using the port/ICD for storage, not tracking location of containers, or stacking over five containers because of lack of space.

A community based system is designed to address this. The computer tracks procedures and payments as they are initiated and completed. This allows the stakeholders to know where the container is in the process toward release, thereby enabling interventions to complete the process. It allows coordination of port procedures through sending alerts that an action is needed and overall monitoring to identify problems to be addressed. A single window system allows one agency to act on behalf of all parties in entering and tracking of containers procedures. It includes all the risk parameters and requirements for most commodities so that the clearance can be completely automated and no human intervention is needed. This leads to greater efficiency and transparency. It also mitigates corruption.

Current Status:

Kenya has financing from the World Bank to develop a single window centralized in the Cabinet through the Ministry of Finance. This position enables it to coordinate all government ministries' participation. Kenya's plan is to develop and implement the system at the port of Mombasa, Kenyatta International Airport and land borders. Tanzania has conducted a feasibility study for the implementation of a community-based system. The Dar es Salaam port community is in process of setting up an organization to develop and implement the system.

Description/ Major Components:

The community-based/single window system is essential to achieving the clearance times needed to handle the level of traffic anticipated for Mombasa and Dar es Salaam. This Project would establish a response mechanism for short term technical assistance as needed in the development and implementation of the systems. An overall budget would be established for each country and the two ports would be able to draw down on it as problems are encountered that are not addressed in long term financing commitment to the project. A separate budget would be established for incorporation of off the shelf software and adaptation as necessary. Project would provide assistance in acquiring software on a PPP basis which includes involvement of software developer on an equity or loan basis.

Critical Factors for Success:

(1) The mechanism for obtaining short term support should be rapid, while at the same time preventing frivolous requests, (2) Assistance should not replicate work already being done or committed. TA requests

would require some public reporting on progress that would identify what is being done and gaps in the developing and financing, (3) Progress of the implementation should be monitored to be sure work progress reflects the urgent need for the system, (4) Information on off the shelf software should be available or readily sourced, (5) Users should be engaged in the development process both in terms of needs assessment and piloting of the system.

Expected Benefits/ Impacts:

These systems have the potential to reduce dwell time to three to four days overall, if done well. They enable the coordination of functions necessary to the most efficient processing of persons and goods. They facilitate optimum coordination among agencies at the port. As they track and monitor the process electronically, they have the capacity to reduce corruption as well since they remove much of the decision making from humans to computer systems.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Short term technical assistance	2011	3 years	1.0
Off the shelf software and adaptation	2011	2 years	1.5
TOTAL			1.5

No.	OPER-TF-01		2011-2013
Name:	Liberalize Transit Requirements	**Action Plan Period:**	
Mode or Subject Area:	Facilitation	**Intervention Type:**	Operations
Corridor:	Northern/Central Corridor	**Country(ies):**	Kenya and Tanzania
Agencies Involved:	Revenue and Transport Authorities		
Related Projects (Donors):	EAC Customs Management Act Regulations and Procedures, EAC and COMESA Common Carrier License development and implementation		

Background/Rationale:

In the Corridor states, road transport regulation included carrier licensing and safety regulation, periodic testing for vehicle road worthiness and driver ability. Kenyan and Tanzanian road transporters carry most transit goods in the EAC. In 1995, Kenya transferred the registration and licensing of vehicles to Kenya Revenue Authority. EAC customs regulation requires that vehicles carrying goods in transit and/or under customs control be licensed. In Kenya, vehicles licensed for transit cannot carry domestic cargo and must use prescribed transit routes. This has the effect of many return trips being empty. Similarly in Tanzania, the issuing of licenses for goods carrying vehicles was abolished. Registration with SUMATRA requires proof of vehicle inspection, third party insurance and registration with Tanzania Revenue Authority (TRA). Through these systems, Kenya and Tanzania restrict road transporters use of their vehicles causing transporters to incur the full cost of a round trip to make a one way delivery. Shippers are often billed for a round trip when they only need to have goods hauled one way. The current regulations need to be reviewed to find a means of avoiding diversion of goods into the local market without unduly raising the cost of providing transport services.

Current Status:

The Tanzania Revenue Authority has experimented with permitting truckers to load backhauls using transit vehicles provided the truck follows the prescribed transit route and reports to TRA check points along the route and to TRA at the conclusion of the trip. While adding to the delays for domestic haulage, it enables the vehicle to return loaded. This system could be tried in Kenya as well, or another system identified. The implementation of the EAC Common Market Protocol, which began on July 1, 2010, has the goal of liberalizing the transport market. In the Protocol, however, Kenya reserved the right to restrict transport operators from other countries to establish a commercial presence in Kenya. Broader issues of market access need to be resolved in EAC.

Description/ Major Components:

(1) TA support to EAC to facilitate discussion between public and private sector stakeholders on phasing out licensing of transit vehicles and vehicles carrying goods under customs control (possibly using TRA approach as starting point). From this dialogue, options should be identified that improve transport efficiency and cost while recognizing the revenue concerns of customs. (2) The proposed option should be piloted on the two corridors and refined based on the pilot. (3) Once a system has been agreed among the agencies involved, the regulations should be modified to accommodate the solution. (4) A system for monitoring impact should be part of the proposal.

Critical Factors for Success:

Success will depend on the willingness of all parties to engage in a dialogue and commitment to finding a workable solution. The pilot will need to be conducted in such a way that it produces quantifiable results and the parameters for new transit regulations. The resulting regulation should be linked to, but not dependent on, the implementation of a regional transport licensing agreement.

Expected Benefits/ Impacts:

A solution that enables optimal vehicle utilization will enable road transporters to reduce their transport costs by thirty to forty percent.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Technical Assistance	2011	9 months	0.4
TOTAL			0.4

No.	OPER-TF-02		2011-2013
Name:	Maximize Customs Union Implementation Benefits	**Action Plan Period:**	
Mode or Subject Area:	Facilitation	**Intervention Type:**	Operations
Corridor:	Northern/ Central Corridor	**Country(ies):**	All EAC countries
Agencies Involved:	Revenue Authorities, Road Agencies		
Related Projects (Donors):	Secretariat Activities in implementing the Customs Union		

Background/Rationale:

The Customs Management Act (CMA) establishes the common external tariffs and reduction formula for reduction of internal tariffs that is currently being implemented. The regulations for implementing the CMA have been approved, and procedures are now being developed. Adoption of a regional external tariff collection system is one of the issues still being determined. Since this system will have a considerable impact on the national transit regulation administered by customs authorities, it will also have a direct impact on the cost and efficiency of transport on the Northern and Central Corridors. Customs controls include such restrictive measures as permitting vehicles for either domestic or transit haulage, escorting, frequent customs stops on major corridors. Therefore it is important that the system takes transport cost and efficiency into consideration.

Current Status:

The EAC Customs unit in the Secretariat is currently working on the tariff collection system and seeking agreement of all member states. In meetings with national customs authorities, it was evident that the national revenue authorities are not consulting with transport agencies in developing transit regulations. It is the right time to provide insight on the impact on transport charges, operational efficiency and vehicle utilization.

Description/ Major Components:

TA is proposed to review the transport cost, time and reliability impact of various proposals for full implementation of the Customs Union. The purpose is to propose a series of recommendations to the EAC Secretariat and the national governments on the impact of each collection method on transport efficiency and trade development within the Community as well as external trade. The goal is for these impacts to be taken into account when the decision is taken by the partner states on the collection system.

Critical Factors for Success:

The success will depend on the ability to make a cogent argument for the impact of collection on transport cost and time and on trade development and the generation of other means of tax collection.

Expected Benefits/ Impacts:

If customs are collected at the point of entry and distributed according to current assessment regimes or according to a revenue sharing formula, many of the current transit controls would be unnecessary. This would have a significant impact on transport cost and efficiency, because transport decisions could be made solely on a commercial basis. This in turn would encourage greater trade and overall value added production in the countries that would generate additional revenue through other tax sources.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Technical Assistance	2011	4 months	0.2
TOTAL			.2

No.	OPER-TF-03		2011-2013
Name:	Streamline Customs Border Clearances	**Action Plan Period:**	
Mode or Subject Area:	Facilitation	**Intervention Type:**	Operations
Corridor:	Northern/Central Corridor	**Country(ies):**	All EAC countries
Agencies Involved:	Revenue Authorities		
Related Projects (Donors):	JICA, DfID. USAID		

Background/Rationale:

Insufficient use is made of customs tools to expedite processing. Clearance modernization is being implemented at the national level and the extent of implementation is varied. Tools include risk management, accredited economic operators, customs bonds and control points, preclearance and so forth. There is need to review current and new procedures on a corridor basis to insure that common procedures are developed and that information collected at one point is available to all transit borders. This both expedites transit and reduces the opportunity for filing different information at different borders. It increases the transparency of trade.

A variety of initiatives have been taken to modernize and harmonize customs clearance procedures. Further implementation and coordination of efforts is needed to arrive at a harmonized system for these two corridors. Since Uganda, Rwanda and Burundi use both the Northern and the Central Corridors, it is important to harmonize the systems used on both corridors. Burundi converted a government customs department to a Revenue Authority in April 2010 and is making a series of changes in its clearance procedures. This is a good time to insure that the transition in Burundi is coordinated with development in the other countries along the two Corridors. Further training and harmonization throughout EAC is needed to achieve the full benefits.

Current Status:

JICA has been providing training in risk management systems and some partner states such as Uganda have fully implemented it so that clearances are expedited for compliant traders and operators. A monthly review of risk profiles insures that the Uganda system reflects current performance of corridor users. Uganda has been working on a system of accredited operators, but not yet implemented. Rwanda has begun implementing an accredited operator system with its blue channel system which has reduced clearance time in Kigali from two to three days to a few hours for compliant customers. As some countries move clearance procedures to the borders, such measures will become even more important to insuring that revenue is collected without unduly delaying trade. Uganda allows clearing and forwarding agents to submit documents in advance and prepay duties based on their calculation, but document review and duty assessment is done at the border or in Kampala at the determination of the importer. Preclearance linked to prepayment is another tool to be implemented in the partner countries. The World Customs Organization is supporting this kind of initiatives and should be a resource to draw on for information and potential support.

Description/ Major Components:

(1) A coordinated program of regional training/capacity building on customs modernization tools followed by regional TA on implementation at national level and harmonization at regional level will result in more streamlined border operations. The training and capacity building must involve the border control agencies and the private sector. The objective is to more effectively implement Risk Management, Accredited Economic Operator Programs, Preclearance and Prepayment, etc. so as to have similar procedures at all borders and risk

management sharing among Revenue Authorities on the corridors to increase the confidence in the system. (2) TA to produce harmonized regional guidelines based on activity (1) above and programs implemented at national level. This would be followed by TA to facilitate incorporation in national procedures and operations to insure that the harmonization is realized. The expected output is harmonized customs procedures at borders that reduce paperwork and increase efficiency of customs revenue collection and transit movement on the corridors.

Critical Factors for Success:

Many of the customs tools involve the electronic transmission of data and payments. The success of this training and TA is dependent on the implementation of reliable interconnectivity between borders and headquarters and among the countries. It also requires reliable, inexpensive data connectivity for the private sector to customs and between clearance points and the borders. The experience of Rwanda demonstrates that where connectivity is available the private sector will incorporate it into its operations so that they also enhance the operational efficiency. Success also depends on the continued commitment of Revenue Authorities to modernize procedures and to see transit efficiency as an important goal. EAC has mechanisms in place for harmonizing procedures throughout the community and needs to use them for this effort. It is independent, but related to OSBP implementation in that a primary objective of the OSBP is to achieve simplified, harmonized procedures. If this initiative is completed, the main issue for the OSBP implementation concerning procedures is how they can be carried out in the neighboring country in the same facility and what further efficiencies can be obtained from operating in proximity and where possible, jointly.

Expected Benefits/ Impacts:

The expected benefit is increased revenue collection, reduced time spent in border clearances and increased trade among EAC countries as well as between EAC countries and countries outside the EAC. This would be achieved through (1) developing national and regional procedures that incorporate the latest techniques for identifying risk of revenue loss to avoid extensive scanning and physical inspections that are time-consuming, (2) rewarding compliant traders rather than delaying everyone for the practices of a few, and (3) encouraging advance preparation of documents, preliminary clearance and advance payment to reduce the time spent at borders.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Training, Capacity Building and TA	2011	24 months	0.9
TOTAL			.9

No.	OPER-TF-04			**Action Plan Period:**	2010-2013
Name:	OSBP Implementation				
Mode or Subject Area:	Port		**Intervention Type:**	Operations	
Corridor:	East African Community	**Country(ies):**	EAC Partner States		
Agencies Involved:	All border control agencies				
Related Projects (Donors):	JICA, Trademark East Africa/DfID, USAID/Compete.				

Background/Rationale:

The East African Community has made a commitment to reducing the time spent at borders and inland clearance by introducing One Stop Border Posts. The objective of a One Stop Border Post (OSBP) is to enhance trade facilitation by reducing the number of stops incurred in a cross border trade transaction by combining the activities of both countries' border organizations at a single location with simplified procedures and joint processing and inspections, where feasible. It is also designed to reduce on the time taken to clear passengers at the border. EAC has common regulations for the implementation of the Customs Union. Procedures are currently being developed and should be adapted for OSBP. Repetitive processing at borders and manual entry of data creates inefficiencies. OSBP should optimize use of electronic data entry and sharing.

Current Status:

(1) In 2010, an EAC legal framework for OSBP was developed with assistance from JICA and approved up to the Multi-sectoral Council of Ministers. The draft EAC OSBP Act, which establishes the legal authority and procedures for OSBP, will be introduced to the EAC Legislative Assembly in early 2011. (2) JICA is funding a project to develop a resource document for OSBP implementation based on current experience and lessons learned at other OSBP, particularly within Africa. (3) A number of projects are carrying out feasibility studies and engineering design for OSBP facilities on the Northern and Central Corridors. At Malaba, the busiest border on the Northern Corridor, several donors have been involved in designing OSBP including USAID, World Bank and DfID.

At Gatuna/Katuna on the Uganda/Rwanda border and Mutukula on the Uganda/Tanzania border OSBP design and construction is being supported by the World Bank as part of the East Africa Trade and Transport Facilitation Project. While procurement is done nationally, Bilateral Committees have been working to coordinate engineering design and procedures to insure harmonization between the juxtaposed facilities. At Akinyaru/Kinyaru Haut between Rwanda and Burundi, the African Development Bank is funding a feasibility study under the East Africa Trade and Transport Facilitation Project. At Rusumo on the Tanzania/Rwanda border, JICA is in final approval for financing a new bridge and OSBP border posts. At Kobero/Kabanga on the Burundi/Tanzania border, DfID through Trade Mark East Africa is financing a feasibility study and engineering design for an OSBP. These projects mean that the facilities will have been designed for all the key borders on the Northern and Central Corridors and the construction for facilities is funded for the first three.

Description/ Major Components:

OSBP are complicated, because of the number of agencies at the border, the lack of a single agency manager and the need for simplified and harmonized procedures. As EAC continues the implementation of OSBP, it is essential that there is coordination so that common procedures and joint inspections are developed as much as possible.

(1) TA for the Customs unit in EAC Secretariat in finalizing and obtaining consensus on OSBP procedures and an oversight mechanism to insure common development of OSBPs. Three consultative workshops are planned for technical agreement on proposed procedures. The EAC OSBP Act establishes most aspects of operations of an OSBP. It allows for divergence of procedures as required by geography or other factors. It is also necessary for each border agency to determine how they will carry out responsibilities in the new arrangement. It is also necessary to determine how joint scanning, joint inspections and other special procedure will be implemented at OSBPs.

(2) Border management information systems are needed for single electronic entry of data and information-sharing. The initial entry into a single data base, sharing of information and handling of preclearance of cargo for compliant customers should be built into the system. It should also take into account the future changes that will need to occur with further implementation of the Customs Union and Common Market. This component entails support for software development and implementation, including training and updating of software. It includes preparation of information sharing legislation, if necessary, among national border agencies.

Critical Factors for Success:

For implementation of OSBP to be successful, all the components should be coordinated and synchronized: legal framework, appropriate engineering design and traffic flow, simplified procedures and ICT applications to enable electronic transfer of information, payments etc. Failure to carry out any of them effectively will diminish the benefits achieved. ICT connectivity needs to be established early in the development process, so that applications can be developed, tested and training completed in advance of the border opening. Commitment from all border agencies is also critical to success.

Expected Benefits/ Impacts:

Where they have been implemented they have cut the time of processing pedestrians and passengers in cars, minivans and buses by half. Substantial time savings for cargo has been achieved depending on the treatment of compliant clients. Time savings result in considerable vehicle operating cost savings.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
TA for Customs Procedures Development	2011	6 months	0.5
ICP Applications Development and Training	2011	15 months	0.5
Software Development			0.5
TOTAL			1.5

No.	OPER-TF-05		2011-2013
Name:	Reduce Informal Payments on Corridors	**Action Plan Period:**	
Mode or Subject Area:	Facilitation	**Intervention Type:**	Operations
Corridor:	Northern/Central Corridor	**Country(ies):**	All countries
Agencies Involved:	National Police, Roads Authorities, Local Government, NCTTCA, CCTTFA		
Related Projects (Donors):			

Background/Rationale:

Both countries suffer from serious delays caused by informal stops and check points on the route. Some are officially sanctioned and some are created to collect payments to police, transit authorities and local communities. Without sufficient law enforcement vehicles, stationary control points to check for driving licenses, vehicle registration, vehicle road worthiness certificates and to inspect vehicles for contraband and trafficking are essential. Nevertheless, unofficial stops delay transit transport and add cost to transport which is passed on to the shipper. In other cases, they are payments to avoid regulatory control, such as payments especially on the Northern Corridor to avoid overloading controls. It will require a concerted effort by governments, individual agencies and the road users to end this problem. Studies on the Northern Corridor suggest a cost as high as US$900 is added by informal stops. Road transporters on the Central Corridor report that the cost is from US$50-100.

Current Status:

Efforts have been made by organizations, such as the Private Sector Foundation and the East African Business Council to monitor the situation and to lobby for better control over informal stops and payment demands. These efforts need to be actively supported and expanded to reduce this practice.

Description/ Major Components:

(1) The project will include TA to work with police departments to set up an internal monitoring unit and to design their own programs to control the number and frequency of official stops and to eliminate other stops. A component of the program should be training on integrity and the impact of the current situation on police credibility and trade. All police should be required to wear uniforms and carry badges, except for detectives or others who for official reasons do not wear uniforms. The project should have a specific budget for TA and resource allocation as recommended by the police units themselves. (2) A public information program will be incorporated to discourage payment of bribes and encourage reporting of officers requesting money. This program should involve both presentations at appropriate meetings and a series of TV and radio spots broadcast at high volume times and concentrated within a specific period. A special week might to organized to focus attention on the issue including presentations, TV and radio spots and stakeholders forum to inform the public on the impact of paying bribes and perpetuating the system as well as to seek other solutions to the problem. (3) The NCTTCA and CCTTFA should be involved in the effort to promote integrity on an on-going basis and have some funds to begin a process of monitoring the roads for compliance. One of their roles would be to work with agencies involved to maintain the vigilance and incentives for mostly unimpeded transit on the highways. The TA would fund setting up a program for long-term monitoring and stakeholder awareness by the corridor groups that is sustainable.

Critical Factors for Success:

It would be critical that the relevant agencies, particularly the police, weighbridge authority and local governments, are committed to maximum free movement on the corridors. Without their commitment, change is unlikely. The program must be sustainable and not a short term correction.

Expected Benefits/ Impacts:

The benefit would be reduced driving, or rather "non-driving," time on the corridors. It will also reduce the informal payments made by drivers and thereby reduce the transport costs and uncertainty. It is designed to achieve a sustainable program to maintain the attention and benefits.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)*	Cost (US$ million)
Technical assistance and facilitation	2011	12 months	0.2
Physical resources for monitoring	2011	18 months	0.2
Public information spots, production and broadcast	2011	12 months	0.5
TOTAL			0.9

*These components would be integrated during the same time period.

No.	OPER-TF-06		2011-2014
Name:	Leadership by NCTTCA and CCTTFA	**Action Plan Period:**	
Mode or Subject Area:	All Modes and Facilitation	**Intervention Type:**	Operations
Corridor:	Northern/Central Corridor	**Country(ies):**	Burundi, Kenya, Rwanda, Tanzania, Uganda, DRC
Agencies Involved:	Corridor Stakeholders, public and private		
Related Projects (Donors):	East Africa Transport Facilitation Project, SSATP Observatories		

Background/Rationale:

Many of the infrastructure and facilitation improvements should be done on a corridor basis. Improvement is a dynamic process driven by dialogue between public and private sectors. CCTTFA and NCTTCA are best positioned to lead and monitor the process at the corridor level. The Northern Corridor Transit Transport Coordination Authority (NCTTCA) was formed to facilitate implementation of the Northern Corridor Transit Agreement signed in 1986/1987 among the participating countries of Kenya, Uganda, Rwanda, Burundi and DRC to guarantee the land locked countries access to the sea for trade. These countries have signed a Revised Agreement in 2009, with the same objectives. Decisions are made by organs comprised of member state plus a stakeholder forum to represent private sector views to the Authority. The Central Corridor Transit Transport Facilitation Agency (CCTTFA) was signed and ratified by the member states of Tanzania, Uganda, Rwanda, Burundi and DRC between 2005 and 2008. Its Board is composed of the Permanent Secretaries of Transport and a private sector representative from each of the five countries for a total of ten members.

The role of both entities is to insure effective operation of transport, logistics and trade on the corridor in the interest of all member countries. With this mandate and structures, they are ideally suited to promote the infrastructure, facilitation and legal and regulatory framework identified by the Corridor Diagnostic Study (CDS) to strengthen corridor infrastructure and operations. These two organizations have specialists on staff for infrastructure, facilitation and trade and some resources provided by members. Nevertheless, they need assistance to develop a sustainable plan for advocacy and fostering stakeholder actions for improvements. This TA should be integrated with the other facilitation TAs to build a sustainable way forward in terms of on-going corridor improvements.

Current Status:

The NCTTCA has been active since 1987 and has an agreed action plan. A series of studies have been carried out for them including the recent transport observatory, master plan for infrastructure development and transport costs on the corridor. A spatial development study has also been carried out to review the opportunities for value-added resource businesses and manufacturing on the Northern Corridor. CDS quantifies the overall transport and logistics operations and recommends investments in each corridor to make it perform better. Therefore the NCTTCA has an active agenda and the data to support its advocacy work. NCTTCA is well established, but needs a way to more fully engage their public sector members in the improvement process and to more fully incorporate the private sector in identifying problems and solutions. As it implements, it needs access to some additional TA and field work on a demand basis. CCTTFA is currently finalizing staff appointments and developing its work plan. CDS identifies issues that need to be addressed in the work plan and recommends actions. An observatory is just being completed which will form a base line for measuring performance results and for monitoring on an on-going basis.

Description/ Major Components:

This assistance would consist of two parts, TA and workshop support. TA to assist in establishing a consultative public private process, based on observatory findings, to set the work agenda and commit government agencies and private sector to responsibility for specific tasks and results. The CCTTFA Board, which has equal public – private membership, would lead the process for CCTTFA and create the link between Corridor group and national government action. NCTTCA would need to create a stronger mechanism for delivering this commitment of both public and private sectors. Once initiated, progress toward agreed outputs would be assessed and redirected every six months. TA would fund meetings for the first two years, and fund 50 percent for the third year as the mechanism is made sustainable

Critical Factors for Success:

This initiative will be successful if all the participating members agree to devote time to specific tasks because they buy-in to the goals. The Northern Corridor has tended to rely on donor support and outside consultants. This TA is intended to encourage active involvement from their members to make the activities sustainable and to reduce the dependence on outside consultants. TTFA needs to set up their operational structure and mode of operation. This TA is designed to allow TTFA to pilot the methodology on several priority issues identified by CDS and the Board and to do so in a way that the model is sustainable. It will also depend on member buy-in to be successful.

Expected Benefits/ Impacts:

For CCTTFA, this TA would assist in determining and implementing their initial work plan. It would address part of their sustainability issue by minimizing use of outside consultants. For NCTTCA, it would strengthen their private sector participation and a sustainable means of achieving results.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
TA	2011	12 months	0.3
Workshops	2011	36 months	0.3
TOTAL			0.6

No.	OPER-TF-07		2012-2013
Name:	Implement Effective Transit Regime	**Action Plan Period:**	
Mode or Subject Area:	Facilitation	**Intervention Type:**	Operations
Corridor:	Northern/Central Corridor	**Country(ies):**	Burundi, Kenya, Rwanda, Tanzania, Uganda
Agencies Involved:	Border Control and Road Transport Agencies		
Related Projects (Donors):	East Africa Transport Facilitation Project		

Background/Rationale:

To be competitive, a corridor should offer seamless movement to travelers, tourists, vehicles and cargo. Transit needs to be seen as an integrated system of shared information, effective guarantees, and a commitment to speed and service. It can best be achieved on corridors, building to an EAC level system. It also requires cooperation among government agencies such as customs, road authorities, police, etc. There are many efforts to streamline and harmonize transit regulations within the East African Community, but many of them have not been implemented. Some have not been agreed at regional level, some have been agreed at regional level and not domesticated in national law and some have been domesticated and still not implemented.

Failure to implement impedes transit movement in terms of cost, time and reliability. (1) Common vehicle dimensions need to be agreed and enforced. Otherwise drivers are restricted to the lowest dimension or weight. (2) Joint recognition for road worthiness testing and certificates so that insurance such as the yellow card can be effectively employed. (3) Application of a single administrative document by customs on both corridors (entered electronically once, downloaded and modified as needed by each country). (4) Full implementation of RADDEx for vehicle and cargo tracking on both corridors and immediate acquittal of customs bonds when goods cross the border. (5) Agreement on full sharing of information on the corridor. Implementing an effective transit regime is done issue by issue, but also requires an overall vision and monitoring to achieve a coordinated outcome.

Current Status:

Many aspects of a transit regime exist, but have not been fully implemented. Common vehicle regulations have been issued, but not fully implemented and there are current efforts to change again. Road worthiness standards have been promoted, but there is lack of trust in the systems of other EAC partner states. Customs declaration have been simplified and harmonized, but each country still requires its own form under national insignia. While they can be filed electronically, they cannot be modified and most countries still require the hard copy as the legal copy. RADDEx and the common customs bond have been partially implemented in EAC. There is need for a more coordinated, pro-active program of implementing a single system.

Description/ Major Components:

The transit regime can most easily be implemented on corridors where the impact of failure to act is immediately felt. Customs items will be affected by the fuller implementation of the Customs Union. It is assumed that the measures recommended here are important to the current transit regime and will be modified or eliminated according to decisions taken on the external tariff collection system and phase out of internal tariffs. TA to achieve the following:

1) Implementation of harmonized vehicle weight and dimension standards and enforcement with a goal of weighing only at port, border (s) and destination.

2) Recognition of road worthiness testing and certificates by all authorities and insurance agencies. Assistance to programs that are weak, either in testing capacity or enforcement.
3) Single customs document produced once with a copy for all customs agencies and copy retained by driver with stamps from all customs agencies. Conversion to and regional recognition of electronic entries, verification and release.
4) Full implementation of RADDEx in all Corridor countries to allow effective tracking. Application of tracking systems for customs, vehicle agencies, and forwarders/shippers using RADDEx.
5) Common customs bond administered on each corridor and later adopted in the region. Immediate acquittals of bond at conclusion of journey.
6) Agreement for full sharing of information on the corridor.

Activity would begin with an assessment of the overall system and where interventions are required and a work plan for activities on both corridors. This would be carried out in coordination with NCTTCA and CCTTFA so that it supplements their initiatives and is monitored by them for sustainability. It would also be coordinated with EAC so that all measures aim toward the development of a community-wide system. EAC would determine continuity with broader Tripartite goals and initiatives.

This is seen as an intermittent activity to provide technical assistance as needed to national and EAC specialists as they work toward implementation. It will provide an oversight mechanism to insure that initiatives continue to move forward and that the result is a coordinated system.

Critical Factors for Success:

These are initiatives that have been addressed at national and regional levels already, but not completed and fully implemented. Success will require sustained commitment and allocation of staff time in relevant agencies at the national level. Success will require fostering more effective coordination between customs, transport agencies and the private sector in reaching solutions that achieve the goal of fostering trade and economic growth.

Expected Benefits/ Impacts:

Time is saved by reduced document preparation. The road transporter is able to make faster, more reliable deliveries at lower costs. Money is tied up in trade transactions for a shorter period of time due to faster delivery and quicker acquittal of bonds.

Costs and Other Data:

Component	Investment Start Year	Duration (specify years or months)	Cost (US$ million)
Technical Assistance	2011	24 months	0.9
TOTAL			0.9