TRADE MARK EAST AFRICA

Study on Establishment of Roadside Stations (RSSs) along the Northern Corridor

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Final Report – 1st Volume

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LIST OF ACRONYMS

Fad:	African Development Bank
AIDs:	Acquired Immunodeficiency Syndrome
ASYCUDA:	Automated System for Customs Data
B:	Build
BCP:	Border Crossing Point
CBA:	Cost-Benefit Analysis.
CBE:	Cross Border and Trade Facilitation Expert
CDS:	Diagnostic Study
COMPETE:	Competitiveness and Trade Expansion
DB:	Design, Build
DBFO:	Design, Build, Finance, Operate
DBO:	Design, Build, Operate
DIC:	Discounted Investments Cost
DNR:	Discounted Net revenues
DPC:	Document Processing Centre
DRC:	Democratic Republic of Congo
EAC:	East African Community
ENPV:	Economic Net Present Value
EU:	European Union
FE:	Financial Expert
FNPV:	Financial Net Present Value
IRR:	Internal Rate of Return
JBC:	Joint Border Committee
JICA:	Japanese International Cooperation Agency
KEB:	Kenya Bureau of Standards
KEPHIS:	Kenya Plant Inspection Service
KII:	Key Informant Interviews
MCA:	Multi Criteria Analysis
MORDA:	Minister for Regional Development Authorities
MPND:	Ministry of Planning, National Development and Vision
NC:	Northern corridor
NEMA:	National Environment Management Authority
NGO:	Non Government Organization
NIB:	National Irrigation Board
NPV:	Net Present Value

OM:	Operation and maintenance
OPEX:	Operating Expenses
OSBP:	One Stop Border Post
PIT:	Project Implementation Team
PPP:	Public & Private Partnership
RADDEx:	Revenue Authority Digital Data Exchange
RCBG:	Regional Customs Bond Guarantee
RCTG:	Regional Customs Transit Guarantee
ROE:	Return on Equity
RSS:	Road side station
SDE:	Stations Design Expert
STR:	Simplified Trade Regime
TGL:	Transit Goods License
TMEA:	Trade Mark East Africa
TMU:	Transit Monitoring Unit
TOP:	Transport Observatory Project
TPE:	Transport Planning Expert
TTCA:	Transit Transport Coordination Authority
URA:	Uganda Revenue Authority
USAID:	United States Agency for International Development
VoC:	Vehicle Operating Costs
WB:	World Bank
WRMA:	Water Resources Management Authority

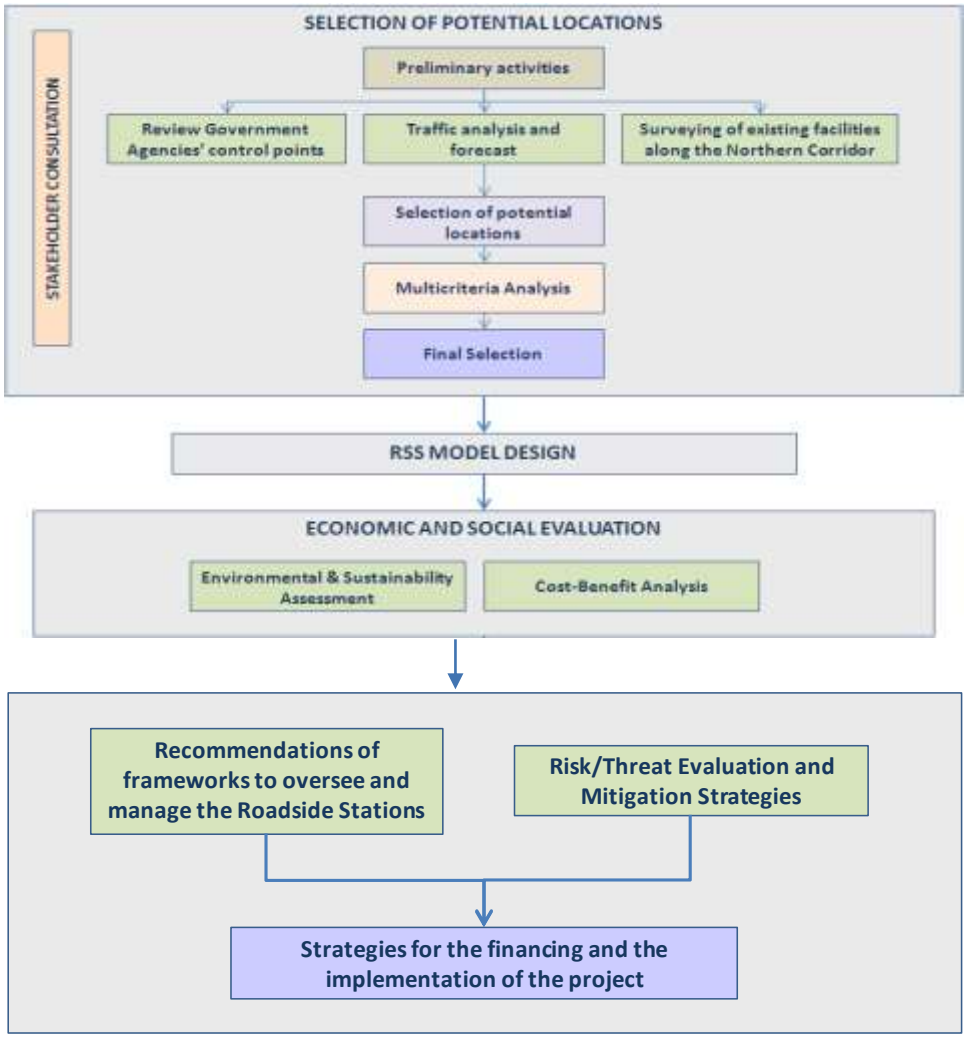
0. EXECUTIVE SUMMARY

This document constitutes the summary of the Final Report of the "Study on Establishment of Roadside Stations (RSSs) along the Northern Corridor".

This report includes

- The selection of potential locations for Roadside Stations along the Northern Corridor
- The model design for these stations
- The economic and social evaluation (environmental, social evaluation and Cost-Benefit analysis)
- The frameworks to oversee and manage the RSSs during development and operation.
- The suitable mitigation strategies to deal with the identified risks and threats of the Project development.
- Strategies for the financing and implementation of the project: The financial analysis and the PPP packaging for the RSSs

The flow chart of all the activities is described below.



The process starts with a number of preliminary activities including the analysis of the existing documentation, a benchmarking analysis of similar experiences and the analysis of the legal framework.

The analysis of the existing documentation has been focused on three main sections:

- Technical characteristics of the Northern Corridor infrastructures and facilities
- Public transport services along the Northern Corridor
- Michinoeki Pilot Study

The objective of the Benchmarking analysis has been to identify existing models of RSS development in other countries that could be useful in the determination of the appropriate locations and facilities for this study. An analysis of the European Directive on driving times has also been included.

The cases analysed are those corresponding to:

- Japan
- Vietnam
- Rwanda
- North Star Alliance
- Tanzania
- Kenya

The European Directive of driving times establishes a maximum time of driving of 4.5 hours without stopping. This is the value that has been taken a criterion (among others) for dimensioning the parking spaces of the Roadside Stations.

The analysis of the legal framework has been carried out in a double perspective:

- Strategic and environmental legal framework
- Cross Border legal aspects

After the preliminary activities of this phase, the tasks have been focused on the decision about the location and main characteristics of the RSSs to be proposed. The stakeholder consultation process has taken place to obtain advice and recommendations on the selection process.

The team has kept several meetings at different stakeholder level:

- Individual potential users of the roadside stations (truck drivers, bus drivers, etc.)
- Local communities with presence along the Northern Corridor
- Different associations: Freight transport, Passenger transport
- Health Clinics
- Immigration and custom officers
- Weighbridges officers
- Others

The main aspects identified during this process are:

- Suggestions on locations of new Roadside Stations
- Possibilities for using new Roadside Stations by mode of transport
- Most significant characteristics and services to be introduced in new RSSs with regard to the existing deficiencies
- Average length of time spent in the roadside stations
- Requirements and main deficiencies along the Northern Corridor

The main stakeholders consulted are:

- Kenya National Highways Authority (KeNHA)

- Uganda National Roads Authority (UNRA)
- Rwanda Transport Development Agency (RTDA)
- Association des transporteurs du Burundi (ATIB)
- Office des Routes du Burundi
- Office des Routes du RDC
- Kenya Long Distance Truck Drivers Association
- Kenya Transporters Association
- Kenya International Freighters and Warehouse Association
- Federation of the East African Freight Forwarders Association (FEAFFA)
- Kenya International Freighters and Warehouse Association
- Rwanda Federation of Transport Cooperatives
- Passenger Transport Companies in Burundi: Horizon, La Colombie
- Officers of the immigration and custom border posts of:
  - KENYA-UGANDA (Malaba post): Meeting in Kenya
  - UGANDA-RWANDA (Gatuna post): Meeting in Uganda
  - UGANDA-RWANDA (Gatuna post): Meeting in Rwanda
  - RWANDA-BURUNDI (Akanyaru post): Meeting in Burundi. The Rwandese authorities did not allow us to have the interview.
  - BURUNDI-DRC (Gatumba post): Meeting in Burundi.
- Interviews with several companies covering the freight transport to DRC
- Weighbridges officials at Gilgil, Webuye and Lukaya
- Health clinic at Emali
- Local communities and truckers at all the main stops identified along the Northern Corridor
- Other stakeholders contacted:
  - Uganda Long Distance and Heavy truck Drivers' Association (ULDAHTDA)
  - Rwanda Long Distance Truck Drivers Union
  - ABADT (Association Burundaise des Agences en Douane et Transitaires)
  - Uganda Freight Forwarders Association

A rigorous selection of RSSs' location has been undertaken by:

- reviewing the Government Agencies' Controls, procedures and formalities
- making a traffic analysis on the Corridor
- surveying the existing facilities along the Northern Corridor

The objective of the review of the Government Agencies' Controls, procedures and formalities has been to analyse the status of the existing transport and trade procedures and formalities (check points and customs) located along the Northern Corridor and to assess their suitability for their incorporation into the network of RSSs.

This involved a number of key steps including:

- The identification of the key border crossings on the Northern Corridor between Kenya/Uganda, Uganda/Rwanda, Rwanda/Burundi and with the Democratic Republic of the Congo and South Sudan.
- The estimation of traffic flows through these border crossings and the forecasts for the future.
- The analysis of transit times at each checkpoint and the principal causes of delays.
- The appraisal of the controls and procedures in place and planned for each of the border crossings.
- The assessment of the quality of facilities in place or planned at each border crossing including those for administration and inspection, parking, storage, analyses etc.
- Other facilities available adjacent to the border crossing including sanitary facilities, rest houses, shops, medical care etc.
- An assessment as to whether any of these border crossings could be included in the network of RSSs.
- An assessment as to whether any of these procedures and/or controls could be included in the facilities and procedures at the proposed RSSs network to relieve congestion at existing border crossings and accelerate transit.

The main conclusions of this analysis are:

- Given the long delays at some BCPs, the establishment of RSSs would have a positive impact
- This would enable the local authorities to develop a much more organised structure
- Malaba and Busia border still have congestion and queuing problems
- Malaba is a priority since it accounts 40% of transit traffic in the corridor. Higher volumes than Busia
- The other borders have lower traffic volumes, although there are no rest houses and there is lack of parking facilities.

The main functions to be transferred could be:

- Parking lots
- Testing and inspection stations
- Warehouses

The objective of the traffic study has been to collect and analyse traffic values of flows along the Northern Corridor. The traffic analysis provides an estimation of the transport demand that will be using the proposed RSSs and will be a major criterion in determining the selection of locations.

In order to conduct the study of traffic in the corridor an extensive field campaign was carried out consisting of traffic counts at various strategically located points. This field campaign has been carried out along the main axis of the Northern Corridor, from Mombasa to Bujumbura.

These counts have been conducted at different times of day and on different days of the week in order to take account of the distribution of the traffic according to the time of day and the day of the week.

The counts have been carried out for the main transport modes to be found in the Northern Corridor:

- Cars
- Minibuses

- Buses
- Trucks

The results of the traffic surveys according to this sectioning for the different transport modes are as follows:

	Passenger Cars	Trucks	Minibuses	Buses
Mombasa-Nairobi	1,995	1,187	54	78
Nairobi-Eldoret	1,897	943	75	95
Eldoret-Kampala	1,639	781	70	92
Kampala-Mbarara	1,883	596	150	60
Mbarara-Kigali	1,498	415	149	54
Kigali-Bujumbura	396	193	171	10

Unit: Average daily traffic volumes, two directions

One of the main criterions to select roadside stations has been the mapping of the current stop points along the Northern Corridor.

This analysis has been done through a survey of the existing facilities. The main aspects determined through this survey have been:

- Existing capacity
- Adequacy of amenities
- Weaknesses
- Needs of enhancement
- Possibility of modal interchanges
- Rest facilities
- Truck assistance

A relevant point has been the determination of the relationship between the current RSSs and the existing traffic volumes in order to determine the size and scale of the future roadside stations.

An identification of the main stop points along the Northern Corridor has been elaborated with the information collected on these trips. The description of these points is provided, together with the information obtained from the local communities.

The information obtained includes (in the majority of the cases):

- Description of the point
- Services and Facilities available
- Sketchmap of the stopping point
- Photographs

During this survey, the team identified 142 main stop points along the Northern Corridor. A first selection process took place taking into account the following criteria:

- Traffic volumes in the sections of the Northern Corridor
- Driving time and distance between stops
- Proximity to border crossings, weigh bridges
- Accessibility and availability of land

- Stakeholder involvement
- Range of facilities

As a consequence of this process, 117 possible roadside stations were selected.

Once we have carried out the first selection of RSSs, we have obtained the following parameters:

- Traffic volumes in the specific locations of RSSs
- Percentage of vehicles stopping at these points
- Percentage of vehicles stopping:
  - Passenger cars: Around 20% of traffic volume
  - Minibus: 25% (Stations of Kigali and Bujumbura, around 70%)
  - Buses: 20-25% (Masaka road 80%, Kigali 100%, Bujumbura 70%).
  - Trucks: Big variation (Gatuna 50%, Voi 2%)
- Number of daily vehicles using the RSSs
- Ratios of vehicle occupancy
  - Passenger cars: 2
  - Minibuses: 10
  - Buses: 30
  - Trucks: 1
- Number of daily users
- Length of stay (hours):
  - Passenger cars: 0,5
  - Minibuses: 1
  - Buses: 1
  - Trucks: 1
- Peak hour factor: 15%
- Economic activities and potential for the same
- Availability of space

Following this process, a Multi-Criteria Analysis (MCA has been elaborated to choose the best alternative option, based mainly on those criteria previously identified.

The criteria used have included the following:

- Existence of a minimum plot of land where the roadside station can be located: YES or NO
- Minimum distance between roadside stations serving the same transport mode: a minimum distance is considered to be of 25 kms
- Location at a point currently having at least a certain minimum use by travellers on the Northern Corridor: A minimum of 5 trucks parked during the peak hour is considered as the minimum threshold of use.
- Social/Legal considerations: Consideration is given to the existence of a local community in the vicinity of the proposed location as a pre-requisite for the sitting of a RSS. Legal constrains have also been considered.
- Urban development considerations: In cases where a roadside station is proposed inside a city, an analysis will be made of the impact that the urban development will

have on the surroundings, checking whether the proposal is admissible or not in urban development terms.

Following this process, the Team reduced the number of RSSs in the main corridor from 117 to 67. This is the final number of RSSs selected in this study.

The proposed RSS sites are an initial batch targeted for region wide investment promotion. Additional RSSs may similarly be identified for investment promotion at a later stage.

Once the final alternative of RSSs has been chosen, the model design has been prepared for each selected RSSs, including their economic appraisal.

The design criteria used include:

- Services/facilities to be implemented:
  - Toilets: All roadside stations
  - Restaurants: Almost all roadside stations
  - Shops: All roadside stations
  - Health clinic: Existing and every 3 roadside stations
  - Bank/Bureau office: Almost all
  - Bar (selling point of soft drinks, water and juices): Complementing the restaurants
  - Car workshops: In roadside stations dedicated to cars
  - Cleaning of trucks: Every 2-3 roadside stations
  - Hotel: every 3 roadside stations
  - Petrol station: All roadside stations
  - Police checkpoint: Where existing
  - Public information area/Administrative office: Development of local communities, transfer of cross border functions
  - Security services: Roadside stations for spending the night
  - Service to trucks (repairs): great concentration of trucks
  - Supermarket: Distributed along the Northern Corridor
  - Weighbridges: Transfer of weighbridges to roadside stations (Webuye, Lukaya)
- Area of the parking spaces (m^2 including access routes of parking space per vehicle)
  - Cars: 15
  - Minibuses: 50
  - Buses: 70
  - Trucks: 70
- Area for other facilities:
  - Toilets: 0.14 toilet units per parking space has been used. 2 m2 per toilet unit
  - Restaurants: 20% of users, a 30% concentration in the peak hour and an average time of 1 hour. 3.5 m2 per place
  - Shops: 200 m^2
  - Health clinic: 100 m^2
  - Bank: 40 m^2
  - Bar: 20 m^2
  - Bureau office: 20 m^2
  - Car workshop: 70 m^2

- Cleaning of trucks and cars: 200 m^2
- Hotel: 300 m^2
- Petrol station: 300 m^2
- Police check point: 25 m^2
- Public information area: 100 m^2
- Security services: 25 m^2
- Service to trucks (repair): 100 m^2
- Supermarket: 200 m^2
- Weighbridge: 700 m^2

The ratios used regarding Investment costs have been:

Parking($/m2)	43.032
Pedestrian and Gardening ($/$m^2$)	9.78
Building ($/$m^2$)	391.2
Gate, Hedge, etc ($)	7,824
Deep Well Work ($)	55,420
Septic tank ($)	26,080
Water tank & Water tower ($)	20,864
Generator (100 KVA) ($)	56,072
Telephone ($)	17,474

And the annual operation and maintenance costs have been:

Personnel (Secretariat for market and restaurant) ($)	6,520
Security guard/parking attendant (three persons) ($)	7,042
Repairs ($/m2 building)	1.165
Public utilities ($/m2 building)	9.896
Others	10% of the four previous concepts

For 26 RSSs we have been able to obtain all the data needed for the dimensioning. For the other 41 RSSs we have used standard model designs, defining three types of RSS: Large (similar to Kabale), medium (similar to Biharwe) and small (similar to Buwama).

Then we proceed to develop the economic and social evaluation of the preferred alternative, comprising an Environmental Impact Assessment and a Cost-Benefit Analysis (CBA).

The project is environmentally and socially acceptable, although some mitigation measures must be introduced in some RSSs due to negative environmental and social impacts.

The Cost-Benefit Analysis has shown very positive results for the project. **The whole project reaches an EIRR of 20.78%** which shows -- compared with a rather high social discount rate of 12% -- **a significant socio economic feasibility**. In practical terms that absolute economic *value creation* can be approximated by means of **the project ENPV, which reaches a net outcome of 99.9 mill.US$ in real terms,** after paying back all the program costs.

Then, the Consultant Team have proceeded to elaborate a series of recommendations of frameworks to oversee and manage the RSSs during development and operation.

The recommended frameworks have been:

- A Private Company finances, builds and operates the RSS (or a group of them)
- A Private Company partially finances (with certain financial contribution from the Government), builds and operates the RSS (or a group of them)
- Government builds (through a Contractor) the RSS (or a group of them) and contract the Operation
- A Local Community finances, builds and operate the RSS (or a group of them)

We proposed the use of specialised companies by subcontracting certain specialised services.

It is also very important the role of the third sector: Community-based groups, Self-help groups, Cooperatives, Local Authorities, Chambers of Commerce, Private Companies of the environmental sector,, etc. having presence in the Steering Group and participating in several business linked to the RSSs.

The main conclusions of the recommended frameworks are:

- Facility operated by the Public Sector management: could be indifferent to the determination of users´ needs; problems of bureaucracy; and rapid decision-making would be impossible.
- Facility operated by the Private Sector: a small number of stakeholders would be involved; the benefits would not reach the local community; and a burden might be placed on users in relation to the provision of services.
- Selecting an operating entity is extremely important and local community should participate in the decision-making process for choosing the operating entity.
- Involving the Third Sector as promoter could be difficult due to lack of capacity. Nevertheless the Third Sector could be in charge of operating permanent facilities such as the market and restaurant.
- Services that investors cannot provide, such as medical services, policy, etc could be leased on annual basis.
- The operating costs need to be covered by revenues from utility charges on the services provided by the different facilities implemented in the RSS.

We recommended a PPP model, which type will be defined after works underway (Guidelines and Hand Book).

It is very important that the Administration have a strong project management team (in each country) within the public sector agency to oversee the implementation of the project.

The responsibilities of each PPP project team are:

- Evaluating whether it is feasible to structure a PPP model for the project
- Structuring the PPP tender that delivers best value for the Government while providing sufficient business opportunities for the private sector
- Evaluating the tender proposals to select the best provider for the PPP contract
- Preparing the final PPP contract document after the preferred bidder has been selected
- Monitoring the progress and performance of the private provider´s work

The structure of the public sector management team could be:

- A Steering Group or Board, which will consist of key decision makers

- A Project Sponsor, who is also member of the Steering Group/Board
- A Project Manager and the project team, which will include in-house staff and specialist external advisors on financial, legal and technical aspects

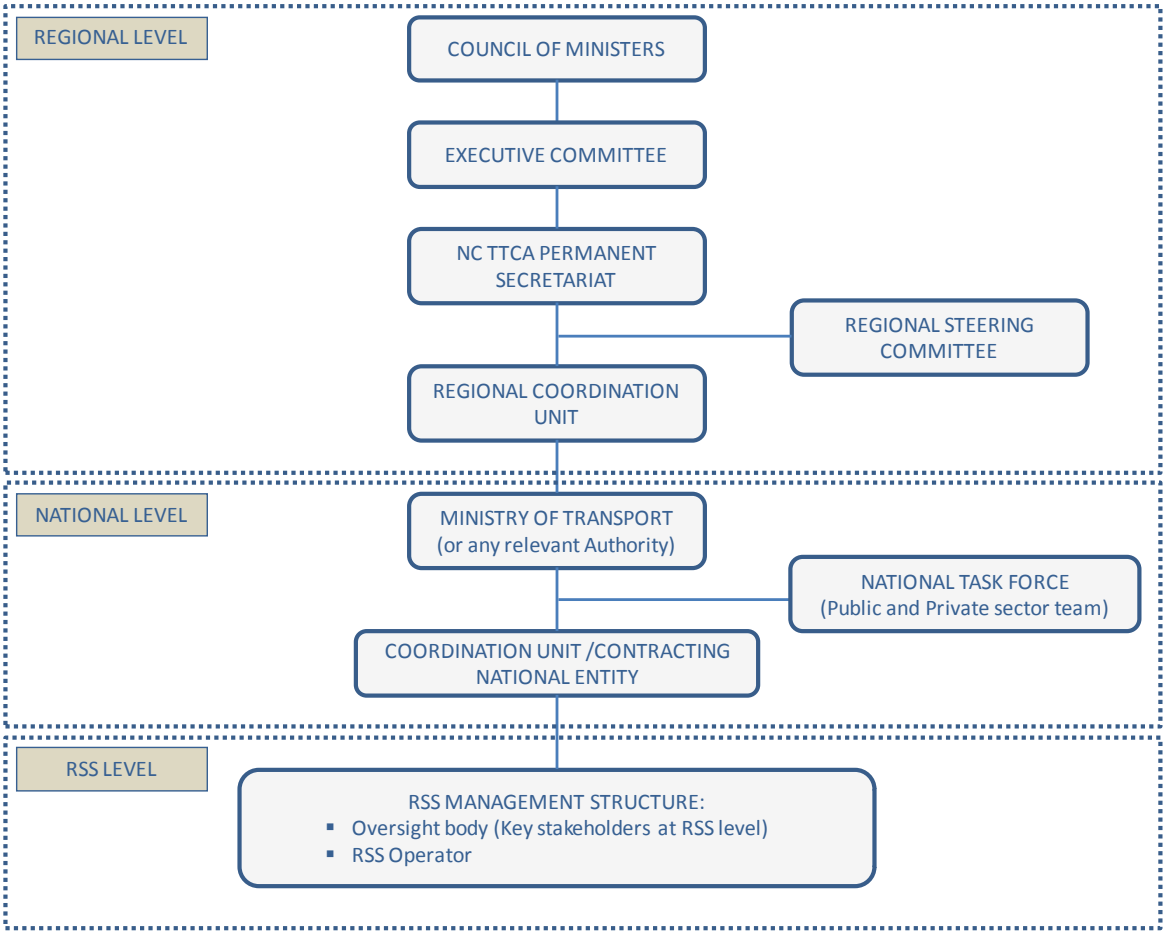
And the competences needed are:

- Financial Expertise: To identify the best sources of financing for the project
- Legal Expertise: To prepare a fair PPP contract
- Technical Expertise: To clearly specify the output/outcome specifications for the services to be provided under the PPP contract

There are some difficulties due to the lack of legislation and law dispersion in the different countries:

- Legal, Regulatory and Institutional structures need to be in place so that they can attract experienced private sector partners
- There is an awareness of the problem and its solution is underway:
  - The PPP Project Advisory Unit Network (PPP PAUN).
  - Consultancy for Preparation of Guidelines and Hand Book (design a guidelines and produce an user hand book)
  - The Manual should include:
    - PPP Preparation and Contracting Options,
    - Planning for PPP Projects and Deals Risk Identification, Mitigation, and Allocation Programming Procurement and Contract Monitoring Institutional Requirements to Structure Bankable PPP Projects,
    - PPP Transaction Advisory Services,
    - Institutional requirements
    - Technical Capacity requirements for PPP.

The recommended organization is included in the following chart:



The oversight, steering and management of RSSs should take advantage of the existing institutional frameworks both at regional and national levels. Implementation frameworks have been proposed as follows:

- At regional level: A steering committee and a coordination unit within the NCTTCA
- At national level: A Task Force including representatives from public and private sector and a coordination unit in the Ministry or other public agency in charge of transport and road safety
- At local/RSS level: A Management Structure, which may comprise an oversight body bringing together key stakeholders at RSS level and RSS operator's management/operation structure

Regarding the Action Plan for implementation, there are some phases for development:

- To establish the necessity of the project: The low-quality or the nonexistence of roadside stations has been detected as crucial in explaining the declining freight transport performance along the Northern Corridor.
- To determine the feasibility of the project:
  - Technical and functional
  - Socioeconomic
  - Financial

The process coordination and monitoring should be undertaken by TTCA-NC, because it is authorized to develop investment projects like this.

TTCA-NC could develop a small PPP unit under the General Secretariat, with the role of unifying criteria and coordinating the different lots of PPPs.

The take-off phase could be this way:

- TMEA is acting as prime mover
- The public role should pass to TTCA-NC when it comes time of contracting
- TTCA-NC must hold the monitoring and control functions of the Construction and Operation phases
- Strong determination to promote private sector participation in the development of NC
- Steps to facilitate its entry and encourage such participation have been adopted
- Some type of PPP will be implemented for developing the RSS Project. This implies a necessary economic return from the resources provided by the Private Sector.

The next step has consisted of proposing the suitable mitigation strategies to deal with the identified risks and threats of the Project development.

The main project risks of this project are:

- In Take-off Phase:
  - Possible need of Public Support. Approvals
  - Project approvals
  - Unattractive conditions for Developers
  - Lack of Legislation
  - Lack of PPP Units
  - Lack of Project Implementation Team
  - Lack of External Funding
- In Construction Phase:
  - Financial Conditions (Foreign Exchange, Interest rate, Inflation, Convertibility)
- In Operation Phase:
  - Project Performance

The contracts must be managed through performance requirements:

- Contract management by Performance Requirements is essential in the management of public services and PPPs
- Aims of Performance Requirements implementation:
  - Assess the quality of service delivered
  - Assess the evolution of the condition of the infrastructure, both functionally (meeting user needs) and structural.
- Determine the functional suitability and the structural capacity:
  - Performance Condition Requirements (indicate the ability of the infrastructure)
  - Performance Operational Requirements (indicate the fulfillment and quality of the services delivered)

It is very important to point out the following remarks:

- The RSS management should not create other Non-Tariff Barriers (NTBs)

- There is a need for advocacy and sensitization both at member States and Regional level.

Finally, the Consultant Team carried out one of the most relevant activities of the Project: "Strategies for the financing and the implementation of the Project". The PPP packaging process has been done and the Project Information Papers have been prepared.

We have developed in this phase a financial model (for each RSS) that will permit to obtain the financial profitability indicators for every RSS, along with the level of potential solvency / bankability (under a project financing scheme) and the eventual needs for public support.

The main technical, operational and financial assumptions adopted are:

- The time horizon considered for the evaluation of the project is 22 years: 2015 – 2036
- Initial investments between 2015 and 2016 (18 months)
- Full operation between 2017 and 2036.
- Timing of disbursements: 65% on first year, and 35% on second year.
- Investments: investment for each RSS is derived from the demand estimated case by case and ratio application from *Michinoeki World Bank guidelines.* CAPEX categories are: Parking area, Pedestrian and gardening; Buildings; Land, etc. All assets are fully depreciated during the operational period.
- Commercial activities in each RSS: as said, we have studied the possible types of services which can be included in a typical RSS and customized these data since not all types of services have been proposed to all RSS[1]. Core activities proposed:
    - Restaurants
    - Shops
    - Banks
    - Workshops (cars / minibuses)
    - Cleaning vehicles
    - Hotels
    - Petrol stations
    - Services to trucks / buses
    - Supermarkets
    - Health clinics
    - Public spaces
- RSS revenue is based on a set of tariffs or rentals from every considered activity in terms of US$ / m^2. Tariffs have been estimated according to TYPSA knowledge on rental price ranges in East Africa (Kenya, Uganda..).

[1] It should be noted that weighbridges activities inside RSS premises have not been considered in the analysis, according to several comments during September 2013 PIT meeting.

Table. Proposed tariffs by activities (nominal prices 2014)

	TARIFFS SCHEDULE (US$ / m2) BY DEMAND ON SERVICE		
	LOW	MEDIUM	HIGH SERVICE
RESTAURANTS	0,462	2,154	5,538
SHOPS	0,224	1,077	2,746
BANKS	0,462	2,154	5,538
WORKSHOP CARS / MINIBUSES	0,897	4,308	10,985
CLEANING VEHICLES	0,075	0,359	0,915
HOTEL	0,045	0,215	0,549
PETROL STATIONS	4,487	21,538	54,923
SERVICES TO TRUCKS & BUSES	1,346	6,462	16,477
SUPERMARKET	0,056	0,269	0,687
HEALTH CLINICS	0,224	1,077	2,746
PUBLIC SPACES	0,200	0,200	0,200

The financial model inputs are:

- Estimated hurdle rate or WACC2: 8.19%,
- Assumptions on operational funding needs (working capital)

==> Increase in WC	
(change in W.C as % of op income)	*3%*
(Working Capital)	
CC	
Cash needed	*2%*
Clients as %	*2%*
stocks as %	*2%*
Providers as %	*3%*

Financial structure:

- Cost of *Senior* debt: 8%. (this can be viewed as a pure market debt or even a weighted average cost (market / institutional debt)
- Grace period: 2 years (construction period)
- Repayment period of Senior Debt: 12 years
- DSCR target for reaching acceptable bankability levels: 1.30 (average first 5 years)[3]

The financial returns considered are:

- Estimation of the **financial profitability of the project**: The global economic financial profitability of the project has been derived from the following financial indicators: a) Project IRR; b) Project Net Present Value (NPV): c) Discounted investment recovery period (discounted Pay Back)
- Estimation of **shareholder financial profitability**: we have studied also the cases in which apart from being globally financially feasible, the project is also *bankable*, that is, if it can creates extra cash in order to: a) repay easily the Senior Debt within a pre- agreed schedule, and b) remunerate accordingly all Equity investors

[2] WACC (*Weighted Average Cost of Capital*)

[3] This is a rather subjective issue. DSCR level should be large enough so as to be very confident (on a project finance basis) on the capacity of cash flows to repay easily the debt (principal plus financial expenses) under the agreed contractual conditions (rates, fees, repayment period..). Therefore, based on our experience in project financing and PPP cases in Africa we think that a DSCR of 1.3 could be fairly realistic.

Within the complete set of 67 priority RSS to be proposed for implementation, three groups could be clearly identified during the study, depending on their financing sustainability possibilities:

- **20 RSS are totally feasible and bankable** and could be implemented entirely through private sector
- **22 RSS can be financially viable with adequate partial public funding** (grant, soft loan.)
- **25 RSS would require financial support from the public sector** at both initial funding and operational level.

Figure: RSS globally financially feasible

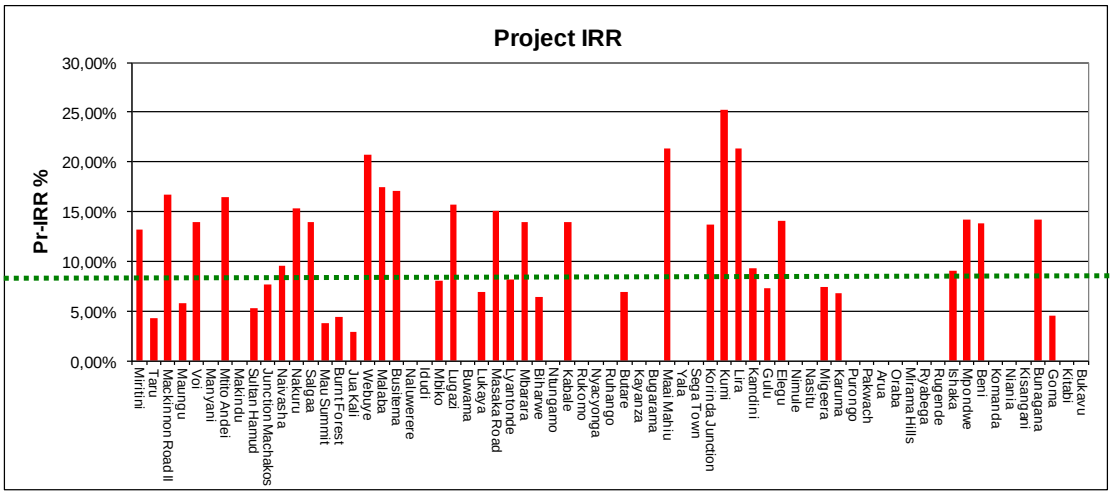


Figure: RSS financially sustainable and profitable for equity providers

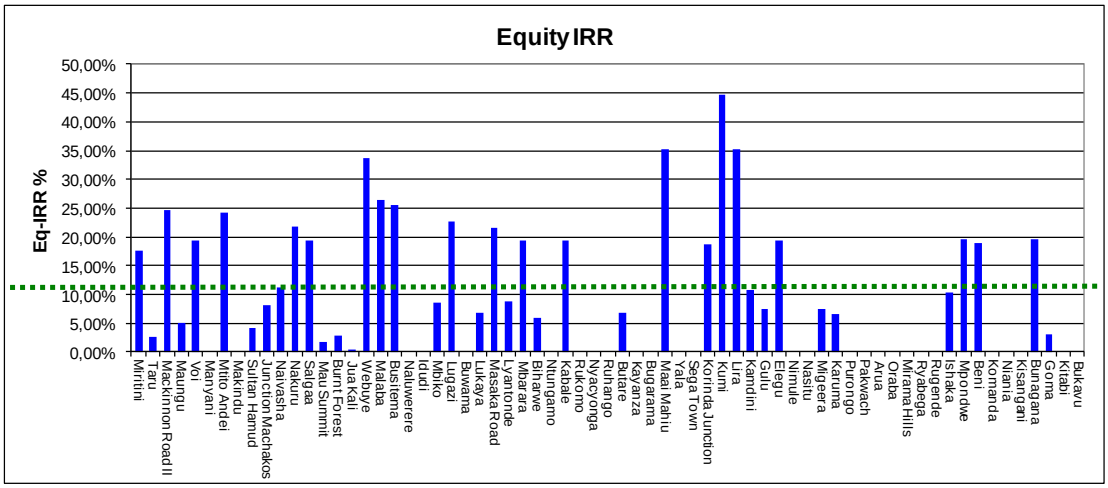
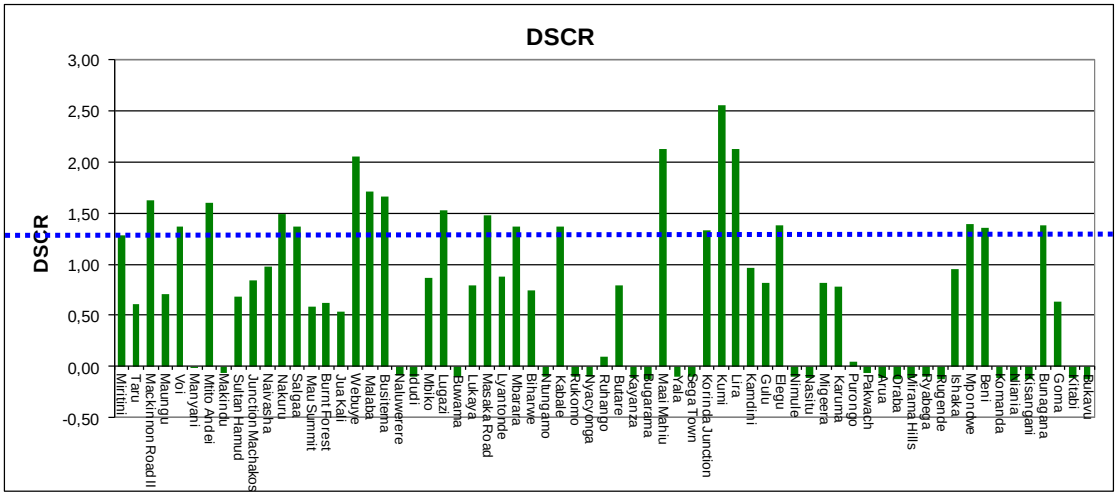


Figure: RSS financially bankable (DSCR>1.3)

DSCR min



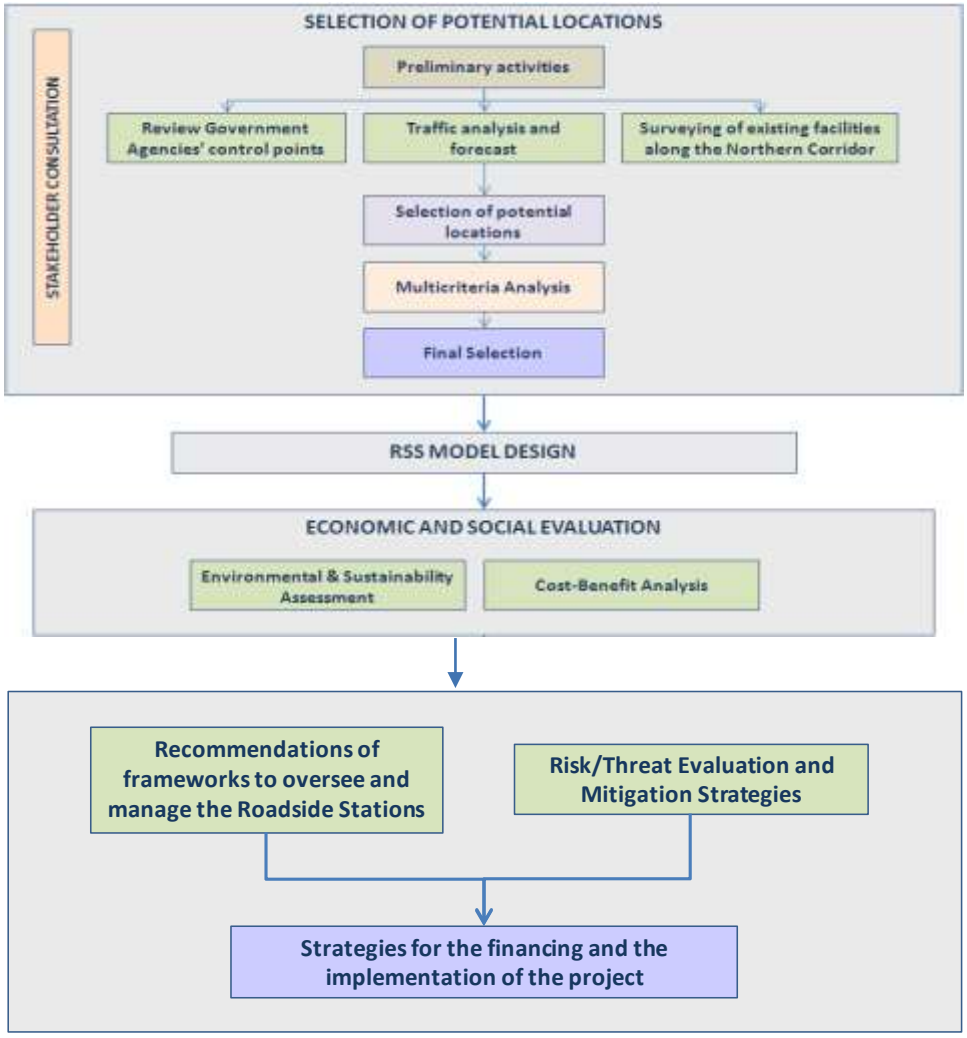
1. INTRODUCTION

This document constitutes the Final Report of the "Study on Establishment of Roadside Stations (RSSs) along the Northern Corridor".

This report includes

- The selection of potential locations for Roadside Stations along the Northern Corridor
- The model design for these stations
- The economic and social evaluation (environmental, social evaluation and Cost-Benefit analysis)
- The frameworks to oversee and manage the RSSs during development and operation.
- The suitable mitigation strategies to deal with the identified risks and threats of the Project development.
- Strategies for the financing and implementation of the project: The financial analysis and the PPP packaging for the RSSs

The flow chart of all the activities is described below.



2. SELECTION OF POTENTIAL LOCATIONS

2.1. PRELIMINARY ACTIVITIES

The process of selecting potential locations for roadside stations starts with a set of preliminary activities.

The preliminary activities are:

- Analysis of the existing documentation
- Benchmarking of similar experiences
- Analysis of legal framework

2.1.1. ANALYSIS OF EXISTING DOCUMENTATION

Numerous studies and publications were reviewed to develop this programme. A brief summary of the main outputs and conclusion of these studies is presented below:

Technical characteristics of the Northern Corridor infrastructures and facilities

The Northern Corridor connects the Port of Mombasa to key markets in Kenya, Uganda, Rwanda and Burundi with links to southern Sudan and Eastern DR Congo and parts of northern Tanzania. It connects the entire East African Community (EAC) to a major regional port and serves a market of some 200 million people. It consists of the following:

- A Road Corridor, which runs from the Port of Mombasa through Kenya to Kampala in Uganda, Kigali in Rwanda, Bujumbura in Burundi and Kisangani in the Democratic Republic of the Congo. It also includes the road from Uganda to the border of South Sudan and from there to Juba. Road transport accounts for over 90% of cargo transported on the Northern Corridor, the bulk of which is imports. The key transit route runs from Mombasa to Bujumbura and is a distance of some 2,000 kms, while the extension from this route to Kisangani is 3,000 kms and the extension to Juba is around 500 kms. There are many other routes within the Northern Corridor, being the total road network of around 8,800 kms.
- Rail Corridor. This is narrow gauge (1000 mm) and runs from Mombasa to Nairobi (530 kms) and Nairobi to Malaba (550 kms) in Kenya. It also links Malaba with Kampala (250 kms) and Kampala with Kasese (332 kms) in Western Uganda near the Democratic Republic of the Congo. A branch line runs from Nakuru to Kisumu on Lake Victoria, and links to Port Bell near Kampala in Uganda. Another branch line runs from Tororo in Eastern Uganda to Pakwach in Northern Uganda. From there, river steamers sail to Nimule in South Sudan. Less than 10% of the cargo transported on the Northern Corridor is by rail.
- An oil pipeline from Mombasa to Nairobi and Nakuru to Kisumu and Eldoret in Western Kenya. Most products are refined in Mombasa and transported onwards from Eldoret by tankers.

Public transport services along the Northern Corridor

The Northern Corridor is one of the most important but congested transport arteries in the whole of Africa connecting the port of Mombasa in Kenya with the land-locked countries of Uganda, Rwanda and Burundi and with South Sudan and the Eastern part of the Democratic Republic of the Congo (DRC). A study (Nathan and Associates, 2010) showed that 21.5 million tons of cargo are transported along the Corridor, most of which is by road (20.3 million tons), the vast majority of which is imports (16.5 million tons). By 2015, it is estimated that this will increase to 35 million tons in total and by 2030 this will have grown exponentially to 89.6 million tons, of which 64.5 million will be

imports. This huge increase in traffic will necessitate enormous investments in infrastructure especially on the road corridor and the port of Mombasa but will also require major initiatives to remove non-tariff barriers, which are a major cause of delays on the Corridor and account for a major part of the transit costs.

Whilst a large number of investments have been made in improving infrastructure both at the port and on the major road links, major problems persist with non-physical barriers to trade including inefficient customs procedures and transit facilities, low competitiveness, lack of infrastructural facilities and frequent internet breakdowns together with poor logistic facilities. In addition there are problems with the following:

- Poor design of border posts with inadequate facilities for parking, inspection, testing, storage, sanitation etc.
- Poor customs procedures with excessive duplication and multiple inspections
- Lack of pre-clearance, post audit, integrated risk management etc.
- Multiple agencies operating at the borders with lack of coordination and synchronisation of controls
- Lack of symmetry in terms of operating hours
- Poor border traffic management

This substantially increases costs to producers, exporters and importers and causes significant delays which seriously affect the competiveness of key sectors especially industry and agriculture. It also raises costs to domestic consumers. It is estimated that while more than 2% of the total logistic costs are attributable to directly to delays on the Corridor, the real hidden costs amount to some 40% of the logistical costs[4].

In conjunction with these problems, the lack of adequate facilities for rest and recovery, for maintenance, for parking and sanitation have had a very serious effect on drivers using the Corridor and has resulted in a very high incidence of HIV and AIDs, the prevalence of prostitution and exposure to robbery and corruption. Road accidents have also been a problem due the lack of rest stops and congestion and queuing at the major BCPs. There is therefore a concentrated effort to rectify this situation on the Corridor by providing multi-functional Road Side Stations (RSSs) to address these problems.

Michinoeki Pilot Study

Michinoeki have been included in the Northern Corridor Transport Improvement Programme funded by the World Bank with the aim of building 5 roadside stations in specific locations along the Northern Corridor in Kenya. A pilot study has been launched and a number of candidate sites (11) have been identified on the route from Mombasa to Kisumu. The selection of these sites was based on the assumption that the intervals between stops should be 100 kilometres, on the assumption that drivers would need to take a break every 2 hours and that the average travel speed would be 30 to 50 kms per hour. On the route, the sites included Mariakani, Voi, Mtito Kiboko, Salama, Mlolongo, Naivasha, Salgaa, Mau Summit, Kericho and Kisumu. Each one of these was evaluated against a number of criteria including its primary type (market type, rest facility, location features, local resources) and the range of functions that they could provide.

On the basis of this two were selected for individual planning: Kericho, which had a distinctive local product of black tea which would satisfy the criteria of market type; and Mau Summit, which had very heavy traffic volumes and significant social problems especially with respect to the incidence of HIV/AIDs infection. This was selected

[4] CPCS TRANSCOM (2010), The Analytical Comparative Transport Cost Study along the Northern Corridor

because it had all the features of a terminal type of Michinoeki. These two were chosen on the assumption that their development and construction would be part of the World Bank's programme for the improvement of the Northern Corridor facilities.

For Kericho, there was a substantial volume of traffic in excess of 2,200 vehicles per day and a high proportion of long distance buses. It was also located at a junction with roads leading to the borders with Uganda and Tanzania. Travellers from Nairobi would, therefore see it as a suitable place for a rest facility. It was decided that facilities should include the following:

- Parking
- Markets
- Tea processing centre
- Restaurants
- Medical clinic mainly for HIV/AIDs
- A meeting place for training use
- An Information Centre
- Toilet and sanitation Facilities
- Water supplies.

For Mau Summit, it also lies at an important junction with roads leading to Mombasa, Kisumu and Uganda and the focus of activities there was to address the social issues especially HIV/AIDS, to develop local markets and to substantially improve traffic safety.

For Mau Summit, it was agreed that facilities would include the following:

- Parking
- Vehicle Maintenance Services
- Market Facilities
- Treatment Centre for HIV/AIDs
- Meeting Place for education and training
- Information Facilities
- Toilet and sanitation Facilities
- Provision of Water supplies.

2.1.2. BENCHMARKING ANALYSIS

With relation to the benchmarking analysis, the objective is to identify examples of similar programmes in other countries which have the potential for replication in the Northern Corridor study. An analysis of the European Directive on driving times has also been included.

There are plenty of examples of roadside stations network around the world. We describe some cases below, in order to identify the best practice to be applied in the roadside stations network of the Northern Corridor.

a) Japan

In Japan, there are over 700 Michinoeki or Road Side Stations throughout the country, which have a much broader mandate and scope than is normally envisaged for traditional RSSs. They are very much linked into the local economies, are built with the involvement of the local communities and are designed not solely for the use of the

truckers who stay at the guest houses but also to stimulate the local economies and provide job opportunities as well as access to a range of facilities including health care, education and training, cultural activities as well as supporting the local restaurants. They, therefore, have a symbiotic relationship with the communities in proximity to them and are a key element in poverty reduction, the provision of health care and local and regional development. The choice of location is therefore critical. These will also be key elements in the design of the RSSs for the Northern Corridor.

In summary, they provide the following:

- Safe and secure Rest Houses and restaurants for drivers as well as local employment opportunities
- Markets for local products and guaranteed outlets for farmers and small scale producers
- Terminals for fuel, maintenance and repair etc
- Public services including good sanitation facilities, access to health professionals
- Financial services such as banking facilities and money exchange
- Traffic information etc.

These are the services and facilities that will be implemented in our RSSs.

b) Vietnam

This Japanese model has been used in Vietnam with JICA funding a number of pilot RSSs, which will form the core of some 80 across the country.

Two were opened in Ninh Binh and Hoa Binh in March 2009 both covering an area of some 6000 m^2.

The Bac Giang station in Song Khe Commune, Yen Dung District will open in January 2014 and will provide parking, rest houses as well as a promoting a range of local products. It will also establish a legal framework for the operation of the RSSs throughout Vietnam.

These all form part of the 'Study on National Roadside Stations Master Plan in Vietnam' funded by the Japan International Co-operation Agency (JICA).

c) Rwanda

MAGERWA Shyorongi Parking Yard is an interesting development and one that has some of the features that the project wishes to incorporate into the RSSs. It is used by tankers transporting fuel in transit or transporting fuel to the domestic market. What is important about this site is that it not only offers parking facilities but also provides the following:

- sanitation and water facilities,
- laundry services,
- kitchens
- medical clinic, which provides a range of services including tests for HIV/Aids.

The Rwanda Bio-medical visits the park each year and also offers counselling to drivers.

d) North Star Alliance Roadside Wellness Centres

The North Star Alliance is a group of non-governmental organisations that are establishing a network of roadside health clinics at major truck stops and border

crossings in Africa. These Wellness Centres offer a practical, low barrier and low cost response to the transmission of HIV and other sexually transmitted infections amongst the transport industry.

First launched in Malawi in 2005, it has expanded into Eastern and Western Africa and in Kenya it has 6 centres located at borders and truck stops at the following:

- Burnt Forest
- Mai Mahiu
- Mlolongo
- Mombasa
- Namanga
- Salgaa

The first was opened in Mombasa in 2009 and the centres provide sexual health education, counselling, testing and treatment for drivers and for the communities with which they have direct contact.

The Alliance works very much with local groups to source, supply and staff the centres and the core partners are the International Transport Workers federation, the Joint United Nations Programme on HIV/AIDs (UNAIDS), ORTEC N.V., the World Food Programme (WFP) and the Ministry of Foreign Affairs in the Netherlands.

e) Tanzania

In 2012, Tanzania launched a study to assess the potential for developing One Stop Inspection Stations (OSIS) on the Central Corridor in East Africa to address the problem of multi-agency involvement in truck inspections, the use of weighbridges and law enforcement. Lack of cooperation combined with the independence of their respective operations had led to endless delays, widespread bribery and corruption and multiple stops, which had been estimated to increase transport costs by approximately 15%. The aim of the OSIS was to combine functions in a number of strategically selected locations initially in Tanzania which could then be rolled out to other countries such as DC Congo and Uganda.

It is envisaged that the OSIS will have a number of facilities including:

- Administrative Office
- Parking and Accommodation for Staff
- Weighbridges
- Recreation Rooms
- Restaurants
- Rest House/hotels
- Cafes
- Banking facilities
- Garage and fuel
- Inspection centres
- Health clinic

It is envisaged that having a police presence at the OSIS would allow them to carry out standardised checks for the enforcement of traffic laws including checking for insurance, licenses, vehicle shipment documents, road worthiness etc. and this would

reduce the need for road blocks and spot checks. It would also allow the police to enforce rest periods if the drivers had exceeded 12 hours which would appear to be excessive and should have been reduced to international standards. Well-being clinics would also provide for routine health checks.

Locating weighbridges at these sites would provide for much stricter controls on overloading and allow for the rationalization of existing stations.

f) Kenya

Kenya has also recently embarked on a new project to provide for the technical upgrading and management of weighbridge operations on behalf of KeNHA. Problems identified with respect to the operation of the weighbridges include difficulties with manual and visual screening, the potential for abuse by the police, poor layouts causing protracted delays and inadequate holding yards. There was a also a distinct lack of cooperation with the police.

The objective is to upgrade facilities and processing of information by:

- Installing a multi-deck and single axle weighbridge system
- Installing High Speed Weighing in Motion System and traffic control equipment (loggers, loops, cameras, license number plate recognition)
- Upgrade the layout and introduce a closed system that is secure
- Install an Integrated IT system
- Provide for a number of mobile stations to capture trucks avoiding the traditional testing stations

The aim is to install this in the near future and to focus on 5 key clusters.

Criteria for stops

For the OSIS project, drivers are to be checked every 12 hours (one days driving). For the Michinoeki pilot project, stops were calculated on the basis of a driving time of 2 hours at 30 to 50kms i.e. 100 kms.

The former would appear to be somewhat excessive and the latter too frequent.

In terms of permissible driving hours, Kenya allows 8 hours within 24 hours under the Traffic Act of 2009. This is almost comparable to EU Directives, which permit 9 hours with an exemption to 10 hours on 2 days per week.

Driving time and rest periods in the European Directive

Regulation (EC) 561/2006 provides a common set of EU rules for maximum daily and fortnightly driving times, as well as daily and weekly minimum rest periods for all drivers of road haulage and passenger transport vehicles, subject to specified exceptions and national derogations. The scope of operations regulated is tremendously diverse and includes: passenger transport and road haulage operations, both international and national, long and short distance, drivers for own account and for hire and reward, employees and self-employed.

The aim of this set of rules is to avoid the distortion of competition, improve road safety and ensure drivers' good working conditions within the European Union.

These rules establish that:

- Daily driving period shall not exceed 9 hours, with an exemption of twice a week when it can be extended to 10 hours.

- Total weekly driving time may not exceed 56 hours and the total fortnightly driving time may not exceed 90 hours.
- Daily rest period shall be at least 11 hours, with an exception of going down to 9 hours maximum three times a week. Daily rest can be split into 3 hours rest followed by 9 hour rest to make a total of 12 hours daily rest
- Weekly rest is 45 continuous hours, which can be reduced every second week to 24 hours. Compensation arrangements apply for reduced weekly rest period. Weekly rest is to be taken after six days of working, except for coach drivers engaged in a single occasional service of international transport of passengers who may postpone their weekly rest period after 12 days in order to facilitate coach holidays.
- Breaks of at least 45 minutes (separable into 15 minutes followed by 30 minutes) should be taken after 4 ½ hours at the latest.

The compliance with these provisions is subject to continuous monitoring and controls, which are carried out on national and international level via checking tachograph records at the road side and at the premises of undertakings.

2.1.3. LEGAL FRAMEWORK

The legal framework that the new RSSs have to operate for the respective countries through which the Northern Corridor passes has been analyzed.

This has been included in the second volume of this report.

2.2. STAKEHOLDERS CONSULTATION

During all the process of elaboration of this first interim report, the Consultant has been in direct contact will different stakeholders of this project.

We have kept several meetings at different stakeholder level:

- Road Authorities
- Ministries of Transport and Public Works
- Individual potential users of the roadside stations (truck drivers, bus drivers, etc.)
- Local communities with presence along the Northern Corridor
- Different associations: Freight transport, Passenger transport
- Health Clinics
- Immigration and custom officials
- Weighbridges officials
- Others

The main aspects we have identified during this process are:

- Suggestions on locations of new Roadside Stations
- Possibilities for using new Roadside Stations by mode of transport
- Most significant characteristics and services to be introduced in new RSSs with regard to the existing deficiencies
- Average length of time spent in the roadside stations
- Requirements and main deficiencies along the Northern Corridor

The main stakeholders consulted are:

- Kenya National Highways Authority (KeNHA)
- Uganda National Roads Authority (UNRA)
- Rwanda Transport Development Agency (RTDA)
- Association des transporteurs du Burundi (ATIB)
- Office des Routes du Burundi
- Office des Routes du RDC
- Kenya Long Distance Truck Drivers Association
- Kenya Transporters Association
- Kenya International Freighters and Warehouse Association
- Federation of the East African Freight Forwarders Association (FEAFFA)
- Kenya International Freighters and Warehouse Association
- Rwanda Federation of Transport Cooperatives
- Passenger Transport Companies in Burundi: Horizon, La Colombie
- Officers of the immigration and custom border posts of:
  - KENYA-UGANDA (Malaba post): Meeting in Kenya
  - UGANDA-RWANDA (Gatuna post): Meeting in Uganda
  - UGANDA-RWANDA (Gatuna post): Meeting in Rwanda

  - RWANDA-BURUNDI (Akanyaru post): Meeting in Burundi. The Rwandese authorities did not allow us to have the interview.
  - BURUNDI-DRC (Gatumba post): Meeting in Burundi.
- Interviews with several companies covering the freight transport to DRC
- Weighbridges responsible at Gilgil, Webuye and Lukaya
- Health clinic at Emali
- Local communities and truckers in all the main stops identified along the Northern Corridor
- Other stakeholders contacted:
  - Uganda Long Distance and Heavy truck Drivers' Association (ULDAHTDA)
  - Rwanda Long Distance Truck Drivers Union
  - ABADT (Association Burundaise des Agences en Douane et Transitaires)
  - Uganda Freight Forwarders Association

The content of the interviews is included in the Annex 1. The main conclusions of these interviews are exposed hereinafter.

Kenya

Truckers

According to the survey conducted in mid July, 71% of the interviewed truck operators don't have timetables, and are pressurized by the truck owners to cover as much distance in the shortest time possible. They only choose a stopping point when it is rather too obvious that they cannot proceed (at the weighbridge or border points). Alternatively, they will park for the night at the nearest shopping center along the road, or at the end of a long climb or descend on the escarpments.

Furthermore, 67% of the truck operators would prefer stop-over in a local market center along the highway as opposed to the few weighbridge points and border posts in existence because of the vibrant night life, illicit trade in fuel and buying of personal effects. Favorite market centers include Sultan Hamud, Makindu, Emali and Mtito Andei. All these centers are famed for vibrant night life, affordable accommodation and food.

Passenger Coaches

Most of the long distance passenger vehicles ferrying passengers up-country from Mombasa are destined to Nairobi city and take about 5 hours to get to the capital city. However, there are other coaches that ferry passengers to the western towns of Eldoret, Kitale, Bungoma and Malaba using the Northern corridor, while others are destined for such places as Busia, Kisumu, Kisii and Migori. The near absence of railway passenger services means that most passengers between these cities travel by road.

The choice of RSS for the commuters is determined exclusively by the crew operating the coaches, except for few cases where certain bus companies have identified designated stop-overs in selected restaurants and petrol stations. The choice of these stop-overs is based on business ties between the companies, or favours that are extended to the crew when they drop passengers to these points for refreshment. It was also noted that some coach companies have rented booking offices in certain towns where they pick and drop-off passengers. While doing so, the passengers in-transit are given time to use bathroom facilities and buy refreshments.

The worst case scenario is where certain operators stop vehicles along the road on secluded spots and ask passengers to dash into the bushes for relief. This is not only unhealthy, but dangerous to the commuters especially considering that stretches of the Northern corridor traverse secluded savannah that teem with wild game.

Uganda

In Uganda, Legislation prohibits parking of trucks and other passenger vehicles in places that are not designated stopping points, and this legislation is enforced by the police and local authorities. Therefore, it is very rare to find trucks strewn anywhere on the road shoulders and reserves. For that reason, there is a number of private and public parks that take care of this need all along the northern corridor. However, it is notable that most private parking are properly paved with perimeter walls or fences and security is provided. The following centers (among others) have designated parking in Uganda:

- Idudi
- Lugazi
- Mbiko in Njeru town council
- Lukaya checkpoint in Masaka district
- Ryantonde in Lakayi District
- Luti in Mbarara Municipality
- Ntungamo in Ntungamo Town Council
- Kabale

At Namari in Industrial area the parking was constrained by space and has not been constructed.

Several bus companies connect Kampala to major cities of neighbouring countries connected by the Northern Corridor. These are Burundi, DRC, Southern Sudan, Kenya, Rwanda and Tanzania. The Baganda bus park situated next to the Kampala New taxi park and the Arua bus park at Ben Kiwanuka Street were the traditional bus stations in Uganda and for many years these stations served as a base for many bus companies. However, due to the increase in number of bus companies and travelers, some new and old bus companies resorted to owning private parking stations all over Kampala City.

All of the buses that operate national and international routes only stop at the major towns where they drop and pick passengers at designated bus parks. The choice of parking for the commuters is determined exclusively by the bus companies operating the coaches.

The community in Uganda appreciate that the truckers and bus operators are an important cog in the local economy and there is mutual interaction between these operators at several levels. There is investment in private parking all along the Northern Corridor, there are many retail outlets that sell wares to the truckers, there are food vendors and hotels that sell produce to the truckers and lodges that provide accommodation, among others.

The concept of RSS is practiced in a basic way by private investors with lorry parks. Most of them offer the very basic facilities, and the users have to seek for extended services like medical, telecommunication, etc from elsewhere. Model RSS should be introduced to revolutionise the concept in Uganda. These RSS will not only serve as important commercial sites where local communities sell their produce and offer goods and services at a fee, but also provide social services to the communities and travelers alike through medical care, HIV/AIDS counseling, education and training, cultural activities and sanitation.

Rwanda

The RSS project is perceived to have many positive impacts to the communities living in the vicinity of Nyacyonga because it will generate a lot of job opportunities during its implementation.

There are no environmentally sensitive or culturally/historically sensitive areas around the proposed site for the RSS. The area has been used for agriculture and livestock activities for a long time. Meanwhile, public infrastructures including roads have been developed in the area.

The proposed RSS will also be in tandem with the District Development Plan which is spread out over five years (2013-2017) to provide an instrument of planning and coordination of interventions that improve the living conditions of the population in Gasabo District and to harmonize development.

DRC

There are three major problems facing truckers who endeavor to cross into Congo.

The visa to enter Congo is US$50 for strictly one week, and should a truck driver delay to exit for whatever reason including truck breakdown, the fine can be anything from US$100 per week after mishandling by the local officials. Elsewhere in East Africa the truckers get one month for the same amount.

It is only in Congo that truckers require an immunization card before entry, failure to which one pays US$50 as fine.

The general security problem in Congo makes truckers want to leave the country as soon as one is finished with the business that took him there.

Congo being a geographically vast country, the nodal distance between towns is large, and therefore a trucker will cover considerable distance before getting to his destination. This long distance should be complimented with a long stay visa to enable truckers to venture deeper into the country.

For these reasons, and other reasons beyond the scope of this program, truckers to Congo prefer to stay in Rwanda or Burundi and cross over to Congo when it is convenient to go and comeback in the shortest time possible. This makes establishment of RSS in Congo not viable from a socio-economic standpoint.

General comments

Driving time

From the interviews conducted, the drivers reported that they rest after 10 – 12 hours of driving. However, they also take short breaks of about 20 minutes – 30 minutes after 2 - 3 hours to relieve themselves, check tire pressure or buy a snack/water by the roadside.

Asked why they work for long hours beyond the recommended working hours, the drivers gave the following reasons:-

- Recovering lost time at weighbridges, police checkpoints or truck break downs;
- They are given little per diem per trip. (Most truck companies pay between Kshs 15,000 to 20,000 for a trip from Nairobi to Goma, for example). Therefore if one spends a long time on the road, then he exhausts his allowance before completing the trip;
- The average salary is Kshs 20,000 per month for a lorry driver which is considered little. So the truckers strive to make more trips in a month so that they get more per diem to compensate for this low pay.

Most dangerous sections in the Northern Corridor

The areas reported to be more dangerous along the Northern Corridor are the following:

- The escarpment climb as you approach Mlolongo truck station along the A109
- Manyani – Mtito Andei stretch is low human population and has high numbers of wildlife. It becomes dangerous to truckers when they get a breakdown, and has been a favourite stretch for highway robbers who target slow moving trucks
- At Athi River just as the driver approaches the City of Nairobi
- In Makueni county the following small centres are dangerous: Kibwezi, Kambu, Mbui Nzau and Sultan Hamud
- Salgaa. The steep escarpment climb from Salgaa is evident since as you travel on the road, you will not fail to notice a group of young men sited by the road side late in the evening
- Sachang'wan has a steep climb in the middle of a forested making it a haven for robbers
- Mukinyai area along the Nakuru/Eldoret Highway
- Timboroa – Burnt forest stretch.
- The bushy stretch between Amagoro and Malaba border post

2.3. REVIEW GOVERNMENT AGENCIES' CONTROL POINTS

The purpose of this activity is to analyze the status of the existing transport and trade procedures and formalities (check points and customs) located along the Northern Corridor and to assess their suitability for their incorporation into the network of RSSs.

This involved a number of key steps including:

- The identification of the key border crossings on the Northern Corridor between Kenya/Uganda, Uganda/Rwanda, Rwanda/Burundi and with the Democratic Republic of the Congo and South Sudan.
- The estimation of traffic flows through these border crossings and the forecasts for the future.
- The analysis of transit times at each checkpoint and the principal causes of delays.
- The appraisal of the controls and procedures in place and planned for each of the border crossings.
- The assessment of the quality of facilities in place or planned at each border crossing including those for administration and inspection, parking, storage, analyses etc.
- Other facilities available adjacent to the border crossing including sanitary facilities, rest houses, shops, medical care etc.
- An assessment as to whether any of these border crossings could be included in the network of RSSs.
- An assessment as to whether any of these procedures and/or controls could be included in the facilities and procedures at the proposed RSSs network to relieve congestion at existing border crossings and accelerate transit. This had to fulfil the following criteria:
  - Control agencies would benefit from the transfer of some of the functions to the RSSs in terms of efficiency
  - The selected RSSs had the necessary secure facilities available and their locations were optimized
  - Transport operators would benefit from their relocation of functions to the RSSs.

2.3.1. LOCATION OF BORDERS ON THE NORTHERN CORRIDOR

The following are the key border crossings on the Northern Corridor. There are 13 in total.

1) Malaba (Kenya/Uganda)
2) Busia (Kenya/Uganda)
3) Gatuna/Katuna (Uganda/Rwanda)
4) Kagitumba/Mirama hills (Rwanda/Uganda)
5) Nemba/Gasenyi (Rwanda/Burundi)
6) Akanyaru/Kanyaru (Burundi/Rwanda)
7) Ruhengeri/Bunagana (DRC/Uganda)
8) Gatumba (Burundi/DRC)
9) Mpondwe/Kasindi (Uganda/DRC)
10) Rubavu/Goma (Rwanda/DRC)

11) Ruzizi (Rwanda/DRC)

12) Oraba (Uganda/South Sudan)

13) Bibia/Elegu-Nimule (South Sudan/Uganda)

2.3.2. ASSESSMENT OF BORDER CROSSINGS

To provide an assessment of the controls and facilities in place at each of the border crossings on the Northern Corridor, a detailed data search was carried out to identify relevant reports on the status of the Border Cross Points (BCPs) together with survey work along the Corridor. Additional research focused on the Transport Observatory's database. This was used as a basis for determining the suitability of some of the BCPs as potential RSSs. For a number, there was a considerable amount of data available, whereas for others, information was very lacking indeed and infrastructure provision was very rudimentary to say the least.

- **a) Malaba (Kenya/Uganda)**

  This border is one of the busiest BCPs on the Northern Corridor with over 800 trucks per day on average crossing to Uganda and 600 to Kenya. Malaba handles approximately 40 per cent of all transit cargo en route to and from Mombasa, Uganda, Rwanda, Burundi, the Democratic Republic of the Congo and South Sudan.

  This is both a road and rail crossing. Joint border posts for railways were established in 2006 with USAID funding and a 24-hour custom facility was introduced in 2008. The post uses SIMBA for processing data and this is fully compatible with ASYCUDA World used by many of the other countries along the Northern Corridor.

  A bridge separates the two customs areas and customs and immigration operate at both ends.

  On the Kenya side of the bridge, other agencies operate including the Ministry of Health, KEPHIS (Kenya Plant Health Inspection Services of the Ministry of Agriculture, KEB (Kenya Bureau of Standards) and Kenya Police. The customs and immigration operate on a 24/7 basis but other agencies only work from 8.00 am to 5.00 pm. Some 20 agencies operate at the border crossing.

  There a number of restrictions with respect to infrastructure with the bridge very narrow and only one truck able to cross at one time. Access roads are also narrow and trucks need to queue for a considerable amount of time irrespective of priorities. The only vehicles which get preferential treatment are the oil tankers, which have priority access.

  Average transit time was 26 hours[5] but this was reduced to 7 hours in 2011 and the target for 2014 is 4 hours when the new road bridge is constructed. Whilst these are the official figures for transit times, the survey of border crossing points suggested a figure closer to 24 hours for transit. The new bridge being funded by the EU should be finished in one year and will substantially improve transit.

  Queuing is still a major problem and there is a severe lack of parking facilities. No rest houses are available to drivers and most sleep in their trucks. Sanitary conditions are very poor and there are no testing laboratories.

[5] Corridor Diagnostic Study Northern and Central Corridors of East Africa.

For goods, which are in transit through Kenya and destined for Uganda, clearance takes place at the border by clearing and forwarding agents. For goods, which are transiting to another country, these must be declared in transit.

The RADDEx (Revenue Authority Digital Data Exchange) is in place allowing agents in one country to take the transit declaration and populate the transit of import declaration. This was upgraded in 2011 allowing a part of the entry process to be carried out at the same time as the exit process (pre-lodgment of simultaneous submission of documents). The number of inspections has also been reduced. This has significantly reduced waiting times and queuing. In 2009, the queue was normally 21 kilometres but this has now been reduced to 7 kilometres.

To speed up transit, trucks cannot enter the queues until their documents are processed and they also have to leave the border area once the process completed. Severe fines are levied if these are not adhered to. Other measures include the verification of cargo by all agencies at the same time, restrictions on the number of clearing agents able to operate within the border station and special provisions for fuel trucks to bypass the queues.

Malaba was used by the USAID-funded Competitiveness and Trade Expansion (COMPETE) as a pilot project in their programme to develop Joint Border Committees (JBCs) to harmonize procedures at borders, reduce protracted delays and accelerate transit. Poor coordination amongst agencies at the border was one of the principal causes of delay resulting in high transaction costs. With no lead agency responsible for oversight, accountability was low and corruption prevalent. This also impacted on smuggling with local traders using other routes to avoid the border crossings.

A Memorandum of Understanding was signed amongst all stakeholders and agreement made on the joint verification of cargoes, operating hours increasing to 24/7 and a package of measures designed to establish coordination and collaboration. The JBC meets every 2 weeks to discuss key issues affecting the management of the border crossing.

- **b) Busia (Kenya/Uganda)**

Situated to the south of Malaba, the post also uses SIMBA as at Malaba but there is compatibility with ASYCUDA World used in Uganda.

This border crossing was included in the survey carried out by TTCA-NC in October 2012. In terms of procedures at the border crossing, trucks transiting through Kenya from Mombasa are checked by the Customs authorities to ensure that the seals are intact before clearing them for exit to Uganda. A certificate of export is issued and this enables the agent to cancel the custom bond through the Customs Bond Section in Nairobi. For goods transiting through Kenya from Uganda, a customs bond is lodged by the agent and customs seal the container. They must then call at the Gilgil and Mariakani customs stations. There had been a programme to install electronic tagging system on all transit vehicles, which could be monitored centrally but there has been some resistance to this and this is done on a voluntary basis.

The customs area is in the town of Busia and trucks pass through the town on their way to the border. There is considerable congestion and very little in the way of parking facilities in the town. Busia has similar procedures as at Malaba but its location does not permit the enforcement of regulations introduced at Malaba. There is a distinct shortage of verification bays and storage facilities. Most transit

trucks use the Municipal car park, which is in poor condition with little fencing and security, which leads them open to pilfering.

The operating times here are the same as those at Malaba and agencies present include the Ministry of Heath, Ministry of Agriculture and Bureau of Standards. Unfortunately, clearing agents do not use the same working hours causing a significant backlog on waiting times.

Licensed traders have access to Kenya's automated system SIMBA that permits the declaration of goods. Normally processing takes 2 hours if the documents are in order and 30 minutes for transit.

Problems identified in the survey included non-licensed agents operating at the border, delays in processing declarations and heavy fines for minor errors and problems with the network especially on the Uganda side.

On the Uganda side, ASYCUDA World is used for the declaration and clearance of goods and all processes are automated using a STR (Simplified Trade Regime), where the threshold is $2000. It issues a Certificate of Origin for goods produced in Uganda. The Uganda Revenue Authority (URA) also uses RADDEx for pre-entries and those with the details entered are directed onwards to transit in the country. Those that have not the appropriate data are directed to the Inland Container Depots (ICDs) until the declaration is made and the process finalized. These are privately owned and are reasonably secure. For goods in transit through Uganda, the trucks are sealed by customs and the insurance bond is lodged.

On the Uganda side, the customs yard and verification bays are inadequate and there is inadequate lighting. There are also frequent power cuts, which affect security and the use of the automated systems for clearance.

It was also noted that JBCs had been established but did not work effectively.

In terms of the transit of vehicles through Uganda, Uganda has a TMU (Transit Monitoring Unit) operating under the Customs Division of Enforcement and this targets specific for monitoring using the RADDEx system. Transit cargo has 3 days to reach Kampala and through traffic has 5 days to leave Uganda, which is verified through clearance at the border station. If the specific vehicle fails to comply then heavy penalties are imposed. There are also fixed and mobile checks along the corridor. Risk profiling is used to target specific cargoes.

The Busia Border Crossing was the subject of a study financed by TMEA in January 2012, *'Report on Time and Traffic Survey Assignment undertaken at the Busia (Kenya/Uganda) Border Crossing'*. This had a much more specific focus to that mentioned earlier in this sub-section and analyses traffic flows and processing times during December 2011.

This study revealed that there were some 6541 vehicles crossing the border in the period under investigation, which amounts to an average of 894 per vehicles a day or 70 per hour. Most of the traffic was in the day although buses tended to cross by night.

Whilst the average queue time was around 1 hour, processing time took anything from one hour to 14 hours depending on the quality of the documentation.

There were on average 398 vehicles per day crossing from Uganda to Kenya of which 27% were containerized trucks (134 per day).

For the crossing in the opposite direction, Kenya to Uganda, there were on average 536 vehicles per day compared with the 398 in the opposite direction. Container trucks (trailers and tankers) accounted for some 27% of these vehicles.

In terms of timing, traffic started at 6.00 am and finished mostly around 21.00 with peaks at 9.0 am and 15.00. Most of the trucks coming from Uganda originated in Kampala and were destined for Nairobi, Mombasa and Kisumu; whilst those arriving from Kenya were also from Nairobi and Mombasa and heading towards Kampala. Most container trucks had 40-foot containers with only 25% carrying 20-foot containers.

With regard to queuing times at the BCP, on the Uganda to Kenya section, the average was 38 minutes although this could take up to 3 days depending on the volume of traffic. Processing time averaged 48 minutes although this ranged from 21 minutes to 2.5 hours. The processing was very much related to the traffic peaks mentioned earlier.

On the Kenya-Uganda side, queuing time was around 1 hour 18 minutes but the range was usually 26 minutes to 3.5 hours. Problems were encountered due to the failure of the Internet system.

With regard to processing times, this averaged 13 minutes with a maximum of 2.5 hours.

- **c) Gatuna/Katuna (Uganda/Rwanda)**

The volume of trucks is approximately 80-100 per day from Uganda to Rwanda and 70 to 80 trucks per day from Rwanda to Uganda of which 60 are cleared under the STR. There is a 500-metre distance between the border posts, which are open 24/7.

This border crossing has OSBPs operating and is specifically designed to accelerate transit with Customs officers from both countries based in respective border posts. Both countries also use ASYCUDA World for processing of documents.

STR (Simplified Trade Regime) is used for clearance with a threshold of $2000. RADDEx is in operation here.

Only the Bureau of Standards and the Health Inspectorate (Department of Agriculture) are present at the border. They are only open from 8:00 am to 5:00 pm. Clearance normally takes 3 hours in the outward direction. Coordination amongst the various agencies is good and for customs issues it is excellent.

The major problems here are the lack of parking yards, which causes congestion along the roads. There are also difficulties in exchanging information due to lack of facilities, power shortages, the inexperience of agents, lack of facilities for handling animals and difficulties in accessing RADDEx. The areas are also very constricted.

Goods bound for Rwanda are not cleared here but in Kigali 80 kms away. Trucks are escorted by convoy.

There are no rest houses and the drivers sleep in their trucks.

- **d) Kagituma/Mirama Hills (Rwanda/Uganda)**

Mirama Hills is located in Ntungamo District, Ankole sub-region, in Southwestern Uganda. The town lies at Uganda's border with Rwanda, and lies very close to the point where the borders of Uganda, Rwanda and Tanzania intersect.

It is located approximately 349 kilometres by road, southwest of Kampala, Uganda's capital. This location lies approximately 29 kilometres by road, southeast of Ntungamo, the administrative centre and the largest town in the district.

ASYCUDA World is currently being used in both countries.

- **e) Nemba/Gasenyi (Rwanda/Burundi)**

Rwanda plans to create OSBPs at all its borders. The OSBP at Gasenyi- Nemba, funded by the African Development Bank which injected US$47 million was opened in February 2012 and is the second one that the country shares with its neighbours, following one established at Gatuna-Katuna that serves both Rwanda and Uganda.

With effect from 27th May 2013, the Nemba-Gasenyi OSBP that is shared with Rwanda and Burundi now operates 18 hours. The border now opens at 4:00 am and closes at 10:00 pm. Previously the border post opened at 6:00 am and closed 6:00 pm. The extension of working hours is to facilitate movement of people and goods at the border.

ASYCUDA World is currently being used in both countries.

- **f) Akanyaru Haut/Kanyaru (Burundi/Rwanda)**

This border crossing is being turned into a One Stop Border Post (OSBP) with a $3 million grant from the African Development Bank (AfDB) with work scheduled to start in 2015 with completion in November 2016. Average daily traffic is 20 per day from Rwanda to Burundi and 15 in the other direction.

This has similar facilities to those at Rubavu with the main difference being that STR threshold is $500 CIF. For those exceeding this, goods need to be cleared at Butare, some 25kms from the border with Burundi. About 10 consignments per day are cleared using the STR at Akanyaru Haut.

Akanyaru Haut has problems with lack of parking and warehousing, and a weighbridge, which is not operational. In general, facilities are very poor and inadequate.

ASYCUDA World is currently being used in both countries.

There are no technical border committees in place and there are very poor relationships amongst them at the borders. There are occasional meetings (every 3 months).

The transit period for Burundi is 3 days and trucks must purchase a Transit Goods License (TGL) for $US200. For foreign trucks, road user charges US$ 72 for a single truck and $US 152 for a trailer.

Problems identified included lack of parking space, lack of computers, etc.

- **g) Ruhengeri/Bunagana (DRC/Uganda)**

The town of Bunagana is a border town between Uganda and the Democratic Republic of the Congo. At an altitude of 1,920 metres (6,300 ft), above sea level, Bunagana is a major crossing point.

On the Congolese side, a road leads to Goma, with a population of some 400,000 and the capital of North Kivu Province in DRC. On the Ugandan side, Kabale, with a population estimated at about 50,000 and the capital of Kigezi sub-region, lies to the east of Bunagana and is connected to it by an all-weather bitumen-surfaced road.

- **h) Gatumba (Burundi/DRC)**

  This BCP handles the clearance of goods in transit received through the Port of Bujumbura and exports originating from Burundi, Kenya, Rwanda and Uganda. Manual processes are used for clearance and once the goods in transit exit Burundi at Gatumba, the documents for the cancellation of bonds are sent to the Customs Office at Bujumbura to facilitate bond cancellation.

  On average, 5 to 10 trucks per day are cleared to exit to DRC.

  Apparently ASYCUDA World is about to be installed in the next few months but at present everything is done manually. There is no technical coordination amongst agencies at the border.

  Infrastructure facilities are very poor and sanitary conditions and water provision totally inadequate.

- **i) Mpondwe/Kasindi (Uganda/DRC)**

  Mpondwe is located in the Rwenzori Mountains, in Kasese District, Western Uganda. The town lies at the border with the Democratic Republic of the Congo. Bwera is another settlement to the immediate east of Mpondwe border crossing. Mpondwe is located approximately 37 kilometres, by road, southwest of Kasese, the district headquarters. This location lies approximately 390 kilometres by road, west of Kampala.

  Mpondwe is served with a tarmac road (the Kikorongo-Bwera road) and good telecommunication facilities. The Uganda shillings, US Dollars and Congolese Francs are used as medium of exchange at the border and money conversion is done by the informal money changers.

  Procedures at Mpondwe are similar to those at Busia and the border crossing handles the clearance of goods in transit through Mombasa as well as Dar es Salam in Tanzania. The border crossing deals with approximately 400 consignments in transit and exports from the DRC and some 200 declarations for goods in transit from the DRC. For the latter, goods in transit at Mpondwe have a specific transit period before they are penalized and all documents are forwarded to Kasindi Customs by courier. Transit Goods Licenses, which are valid for a year cost $200 per vehicle and the applicant must produce a log book, a valid 3rd Party Insurance certificate and show that the vehicle is in good mechanical order.

  The financial services at Mpondwe market are accessed in Bwera and Kasese towns that are 10 and 59 kms away respectively. Government institutions like customs, immigration and police are available while the customs post on the DRC side is located at Kasindi, about 5 kms away. During market days, goods are off loaded directly from Ugandan trucks onto Congolese trucks, without necessarily being stored at the market. However, the market is served with four stores, each with a capacity of about 20 MT.

  Problems identified at Mpondwe include the lack of a verification shed, lack of storage facilities, network failures and location problems with the public Markey lying between the border crossing point and the URA Customs office.

  Kasindi uses ASYCUDA World but lacks information on goods transshipped along the Northern Corridor.

- **j) Rubavu/Goma (Rwanda/DRC)**

  On average some 40 to 70 trucks are cleared for exit to DRC from Rubavu.

The Goma-Rubavu on the Democratic Republic of Congo-Rwanda (DRC) border is being refurbished to support the trading for peace programme in the Great Lakes region. This programme targets three border areas, namely Gatumba-Kavimvira (Burundi-DRC border); Bunagana (DRC-Uganda border) and one border between Kenya and South Sudan. Funding of the project is provided by the German Development Bank (KfW) which donated a grant of €10 million. For each border post, the project will fund infrastructure such as markets, storage facilities/warehouses, feeder roads, and basic sanitation and accommodation facilities as well as administrative infrastructure for the Trade Information Desks and Custom and Immigration offices. The project funds will also be used to support capacity building of various stakeholders involved in cross border cooperation including border Officials, Cross Border Traders' Associations and Trade Information Desk Managers.

In terms of procedures, ASYCUDA World is used at Rubavu for customs declarations but for some agricultural loads, no declaration is needed. Goods in transit through Rwanda are inspected to check if the seal has been broken and if not then the bond is cancelled and the transit vehicle is free to cross to the DRC with a full set of documents. For goods entering from the DRC, traders need to submit invoices, packing lists, certificate of origin and license to permit. The goods are then put in the warehouse at the border before proceeding to Magerwa warehouse in Kigali.

Goods entered for transit at Rubavu are given 2 to 4 days to exit Rwanda and then the bond is cancelled.

Customs at DRC Goma use ASYCUDA World and agents are allowed to access the system to make their declarations.

Trucks entering DRC need to purchase a single entry permit, which costs US$ 30 for a trailer and US$ 15 for a truck with 3 axles and is valid for 15 days.

Problems encountered in include delays by DRC Customs submitting their declarations, issues related to differing working hours, delays due the large number of weighbridges.

- **k) Oraba/Kaya (Uganda/South Sudan)**

Oraba is a small border town in Koboko District, West Nile sub-region, in Northern Uganda. It sits directly across the border from Kaya, South Sudan,

The Government of Uganda (GOU) has received a credit from the International Development Association (IDA) towards the cost of the Transport Sector Development Project (TSDP) to finance the upgrading of Vurra-Arua-Koboko-Oraba Road (92km) to paved (Bituminous) standard.

- **l) Bibia/Elegu-Nimule (South Sudan/Uganda)**

Nimule is the main border crossing point between Uganda and South Sudan with 90% of traffic, averaging 140 – 160 trucks per day. These are mainly imports with limited exports. There are no examination facilities and basic infrastructure is needed. The second border crossing is at KAYA.

Gulu-Nimule Road is a road in Northern Uganda, connecting the city of Gulu in Gulu District and the town of Nimule in Eastern Equatorial State, in South Sudan, just north of the international border between the two countries. The road, known as Highway A104 in Uganda, continues into Southern Sudan as Highway A43.

2.3.3. TRANSIT TIMES

The Transport Observatory' Project's latest report of April 2013 has provided some critical data on transit times across some of the countries on the Northern Corridor which will be useful when determining optimum locations for the establishment of RSSs.

Firstly, in terms of the volume of imports passing through the port of Mombasa, the following shows the share according to main countries of destination:

- Kenya 68.15%
- Uganda 23.01%
- DRC 2.43%
- Rwanda 1.19%
- Burundi 0.26%
- Others 4.96%

About 70% of imports through Mombasa are destined for Kenya and 23% for Uganda with relatively small shares to the other countries.

Transit cargo to South Sudan peaked at around 10,000 DWT in November 2012 compared with a figure of some 1,000 DWT in April 2012 and 5,000 DWT in August 2012[6]

Using the data from the GPS tracking system operated through the TOP, the average transit time to Busia was 3 to 4 days whilst that to Malaba was 4 days. This was the time from clearance from the port of Mombasa where the average dwell time was 5- 7 days for June 2012 to February 2013. Whilst this was the average dwell time, some months demonstrated figures much higher than this, sometimes reaching 10 days pushing the overall transit time to 17 days if the time at the port is included. This did not include the crossing time at Malaba.

In terms of the frequency of trucks to Malaba and Busia, the table below shows the number of trucks at each of the respective BCPs. Malaba has shown an increasingly larger volume of trucks crossing the BCP whilst Busia has shown a significant decline.

Year	Frequency to Busia	Frequency to Malaba
2010	37,619	407,254
2012	40,200	441,187
2013	23,271	458,807

Source: Kenya Revenue Authority. 2010 to 2013

For transit times in Rwanda, Gatuna to Gisenyi averaged 2 to 5 days whilst Gatuna to Akanyaru-Haut was 1 to 3 days.

The frequency of trucks from Gatuna is shown below:

Year	Frequency to Gisenyi	Frequency to Akanyaru-Haut
2011	23,677	4,765
2012	22,058	6,209

Source: Rwanda Revenue Authority (2009-June 2013)

[6] Source: *Electronic Data, Kenya Ports Authority (KPA) April to December 2012.*

2.3.4. ASSESSMENT OF CAPACITY OF BCPs TO BE INCLUDED IN RSSs NETWORK

In the Inception Report, this component was designed to explore the following:

a) Whether any of these border crossings could be included in the network of RSSs.

b) Whether any of these procedures and/or controls could be included in the facilities and procedures at the proposed RSSs network to relieve congestion at existing border crossings and accelerate transit.

This had to fulfill the following criteria:

- Control agencies would benefit from the transfer of some of the functions to the RSSs in terms of efficiency
- The selected RSSs had the necessary secure facilities available and their locations were optimised
- Transport operators would benefit from their relocation of functions to the RSSs.

The issue of whether the existing BCPs could be incorporated into the proposed network of RSSs raises a number of issues.

Clearly the BCPs are ultimately designed to affect the transit of goods and people across the borders as rapidly as possible whilst ensuring security and compliance with the customs laws and procedures in place in the respective countries on the Northern Corridor. Transit times at border crossings are a crucial measurement of the efficiency of the border controls and the quality of the facilities. Major efforts have been made to set up the JCBs at certain crossings, to harmonise computer systems and to start the process of establishing OSBPs. It would appear foolhardy to attempt to disrupt this process and to interrupt its extension to all BCPs on the Corridor.

Nevertheless, given the long delays at some of the BCPs, the establishment of RSSs within a reasonable driving distance of the BCP would have a positive impact and ensure that drivers had adequate rest but also provide them with access to health care that could significantly reduce the incidence of HIV/AIDs. It would also help to relieve congestion at the key borders and in towns like Busia where the border post is in the centre of the town; and in Malaba where there are long tailbacks due to high volume of traffic and lack of parking facilities.

It would also enable the local authorities to develop a much more organized structure than the ones in place at present where there appears to be little in the way of organisation with few rest houses, small, localized markets and a high incidence of prostitution and disease, especially HIV/AIDS.

In terms of focus, both Malaba and Busia on the Kenya/Uganda border still have congestion and queuing problems despite the fact that an OSBP is in place at Malaba. Whilst the situation has improved markedly in recent years and the construction of the new bridge will significantly improve the situation, facilities within say a reasonable driving time would help to alleviate the congestion and assist in developing local community initiatives.

Clearly, Malaba is a priority since it accounts for over 40% of transit traffic and has much higher volumes than Busia. Given that they are both a 4 day driving time from Mombasa facilities nearby would capture a large share of the transit traffic on the Northern Corridor. It would also provide a critical health care function and assist truckers in combating endemic diseases and sexually-transmitted diseases. Since the major proportion of the transit traffic is destined for Kenya and Uganda, then the focus on the routes to these crossings should be seen as a priority especially given the huge increase in traffic forecasted for the medium and long –term.

On the Uganda/Rwanda border, the volume of traffic is not of the same magnitude as at Malaba and Gatuna/Katuna has an OSBP in place with traffic in the order of 80-100 trucks per day from Uganda to Rwanda and 70 to 80 in the opposite direction. Lack of parking facilities nevertheless causes considerable congestion and there are no rest houses with drivers sleeping in trucks. A RSS nearby could provide a very useful facility near the key border to Rwanda.

OSBPs are in place at Nemba-Gasenyi and Akanyaru Haut/Kanyaru on the border between Rwanda and Burundi. Whilst the former is operational, Akanyaru still has poor facilities pending the future funding for reconstruction. Whilst traffic volumes are low, these BCPs are the main access points to Burundi and could serve as a location for RSSs.

2.3.5. TRANSFER OF FUNCTIONS

In terms of transferring functions to the RSSs, the scope and function of each facility needs to be determined. The key criterion for selection, however, should be that they are not seen in isolation merely providing rest houses but should be clearly seen in a development context where they serve not just transit traffic but also the local communities, which can benefit from a range of facilities including health centres, educational and cultural provisions as well as generating income through the development of local markets.

In terms of transferring functions from the BCPs, care needs to be taken not to implement measures that might have a potentially negative impact on the BCPs. As was mentioned earlier, transit delays at BCPs have been a major factor in the high transportation costs on the Northern Corridor.

There are a number of areas where there is the possibility for the transfer of functions. These include the following:

a) Weighbridges

Weighbridges have proliferated particularly in Kenya and Uganda ostensibly to enforce the laws and regulations but they have had an adverse effect in many cases. Endless stopping to check loads has seriously affected transit times across the countries and the widespread use of informal payments to facilitate passage has led to widespread abuse of the system with overloaded trucks bypassing the regulation in exchange for informal payments.Truck owners often prefer to pay these fees to allow overloaded trucks free passage along the Northern Corridor.

Locating some of these facilities within the area of the RSSs could be one way of rationalising the number of weighbridges and bringing in a greater measure of control on axle loads.

This also would relieve congestion at other locations on the Corridor and could also be combined with repair and maintenance facilities that ensure that trucks meet the required standards for transit. This would obviously require the construction of these facilities together with offices for the staff. Private operators would also require services for repair (workshops) as well as disposal sites for potentially contaminating materials.

Consideration needs to be given to locating weighbridges next to the RSS facility. This would serve to rationalise their current location, achieve economies of scale and concentrate resources in one location. As was explained in the Benchmarking Analysis, Kenya is already embarking on a project to provide for the technical upgrade and management of weighbridge operations using new technology.

In this sense, KeNHA has formulated a policy that prohibits all other activities within 2 km radius of the weighbridges. This explains why all other activities including hawking, recreation and wellness centers have been expelled from within the weighbridge premises.

For that reason, no RSS will be allowed near the weighbridges. This implies that no RSSs will be developed near Mariakani, Gilgil etc…

The Immigration department is relocating trucks parkings from the border posts, and are working on an expedited system where trucks clear and leave the post within the shortest time possible.

b) Warehousing

Secure warehousing could also be attached to some of the RSSs and these could provide for the possibility of pre-clearance and post-audit to remove congestion at the border crossings. If this option is chosen, then the appropriate control and regulatory procedures will need to be put in place. What needs to be recognized is that there is going to be a huge increase in traffic volumes in the medium and long term and even with new control procedures in place at the established BCPs, congestion will increase and measures will need to be taken to filter the levels of traffic transiting the BCPs at any given time.

c) Secure Parking Lots

Currently, queuing and parking still cause congestion at major crossing such as Malaba and Busia, This has a major impact on the functioning of the towns and on road safety. Providing secure parking lots near the BCPs on the periphery of the RSSs could help to alleviate this problem and provide a filtering and control mechanism for traffic approaching the BCPs. It would also allow the truck drivers the full range of medical and educational facilities being offered at the RSSs. In addition, it would provide a market for local produce and provide for much needed employment opportunities. Security would be an essential element in the design of these as would their control.

d) Testing Stations

The other area that could be explored would be the possibility of establishing Road Worthiness Testing Facilities at the RSSs, would be linked to the establishment of repair and maintenance facilities. Legislation would need to be provided to allow for certification.

Transferring these facilities to the RSSs would require changes in the legislative framework but would nevertheless provide a potential. source of income for the RSSs.

e) Inspection Stations

Again as was explained in the Benchmarking analysis, there is also the possibility of establishing One Stop Inspection Stations (OSIS) at selected RSSs and these would combine many of the functions included in the profile of the RSSs. The advantage of locating these at the RSSs would be that the number of police road blocks would be reduced, standardized checks could be carried out by the police at the RSS including checking insurance, licenses, vehicle equipment documents, road worthiness etc. and this would have a very positive impact on road safety. It would also enable the police to check driving hours for truckers. The provision of garages/maintenance stations nearby would also provide an important support structure and allow local entrepreneurs to develop.

In terms of the changes that need to be made to develop the RSSs and to integrate Government controls at the BCPs and on the highway, a number of initiatives need to be undertaken.

- As was explained earlier, there are many projects moving forward to develop One Stop Border Points (OSBP) and these will play a very important role in reducing transit times at borders as they are rolled out to the major crossings on the Northern Corridor. Attempts to transfer customs procedures to the RSSs would have a negative impact and should be avoided. However, introducing RSSs with some of the functions of the OSISs would have a very positive effect on reducing congestion at the major borders and in improving road safety through longer driver rest hours, road worthiness certification and assistance with health matters.
- Rationalisation of the current weighbridge system would need to be coordinated with current programmes such as that being implemented in Kenya with KenHA and the OSIS scheme if it is to be developed in Uganda and the DRC.
- If there is to be a transfer of functions to the RSS, then the necessary legal framework needs to be put in place to provide for regulation, certification and testing as well as for revenue collection.
- There will need to be strong cooperation between the police, the authorities responsible for the operation of the weighbridges and the revenue authorities.
- This will need to be combined with a cultural change in terms of policing to significantly reduce the propensity to seek payments at road blocks and to retrain the traffic police.
- There will need to be a reduction in the number of road blocks and the concentration on the RSSs as the focal point for testing and certification.
- Police should also have the power to enforce driving hour limits and to stop drivers from proceeding if they have exceeded the statutory hours. In the OSIS study, the aim was to have drivers obliged to stop at secure sites at a maximum of one day's drive from each other (12 hours). For the Michinoeki pilot project, stops were calculated on the basis of a driving time of 2 hours at 50 kms i.e. 100 kms.
- It would be extremely useful if standard guidelines were established for the operation of truckers along the whole length of the Corridor. For the OSIS project, drivers are to be checked every 12 hours (one days driving).

The levels of Government controls will be determined by the extent of services at each RSS. If the aim is to develop weighbridges and Inspection Stations, then the degree of Government controls will be more intense. The aim of the initiatives is, however, to complement what is in place or being planned so that a cohesive approach takes place.

2.4. TRAFFIC ANALYSIS AND FORECAST

The objective of this activity has been to collect and analyze traffic values of flows along the Northern Corridor. The traffic analysis provides with an estimation of the transport demand that will be using the proposed RSSs and will be a criterion to determine the selection of locations.

In order to conduct the study of traffic in the corridor an extensive field campaign has been carried out consisting of traffic counts at various strategically located points. There exist various publications and sources where the traffic in the Northern Corridor is shown on an aggregate basis, but the Consultant has preferred to carry out traffic counts along the Corridor and specifically in the vicinity of the points where roadside stations can be implemented, in such a way that a direct estimate can be made of the traffic likely to use those facilities.

This field campaign has been carried out along the main axis of the Northern Corridor, from Mombasa to Bujumbura. Traffic data corresponding to the other sections of the Northern Corridor have been obtained from the Roads Authorities of the countries.

The countings where made during the week from 17 to 23 June 2013 by the Consultancy Team.

These counts have been conducted at different times of day and on different days of the week, in order to take account of the distribution of the traffic according to the time of day and the day of the week.

Consultancy Team performing the traffic counts

The counts have been carried out for the main transport modes to be found in the Northern Corridor:

- Cars
- Minibuses
- Buses
- Trucks

An aggregation of the traffic volumes has been made according to a proposed sectioning for the main axis of the Northern Corridor. The sectioning is as follows:

- Mombasa-Nairobi
- Nairobi-Eldoret
- Eldoret-Kampala

- Kampala-Mbarara
- Mbarara-Kigali
- Kigali-Bujumbura

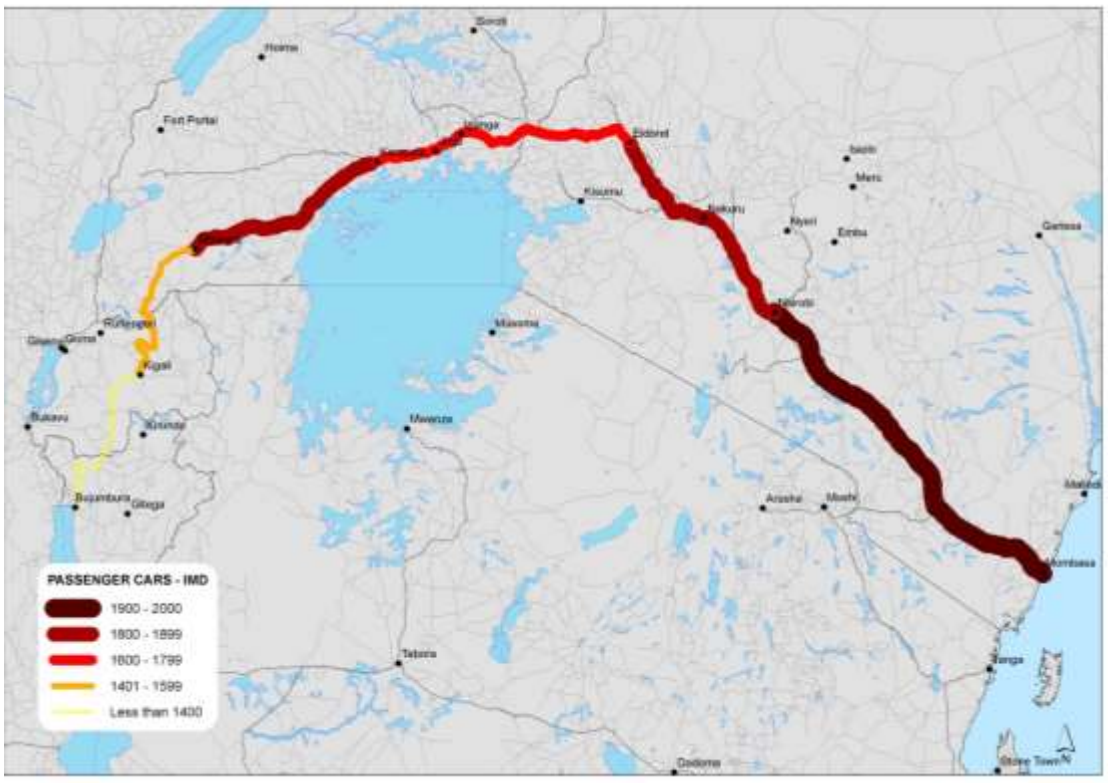
The results of the traffic study according to this sectioning for the different transport modes are as follows:

	Passenger Cars	Trucks	Minibuses	Buses
Mombasa-Nairobi	1,995	1,187	54	78
Nairobi-Eldoret	1,897	943	75	95
Eldoret-Kampala	1,639	781	70	92
Kampala-Mbarara	1,883	596	150	60
Mbarara-Kigali	1,498	415	149	54
Kigali-Bujumbura	396	193	171	10

Unit: Average daily traffic volumes, two directions

The following plans show the results of the demand analysis for each of the transport modes being considered.

PASSENGER CARS



As can be seen, the greatest concentration of passenger cars occurs in the section Mombasa-Nairobi, followed by the sections Nairobi-Eldoret and Kampala-Mbarara.

The section Eldoret-Kampala has less traffic than these two sections, though the sections Mbarara-Kigali and very especially and with a great difference, Kigali-Bujumbura, are the ones which have the least traffic on the entire main route of the Northern Corridor.

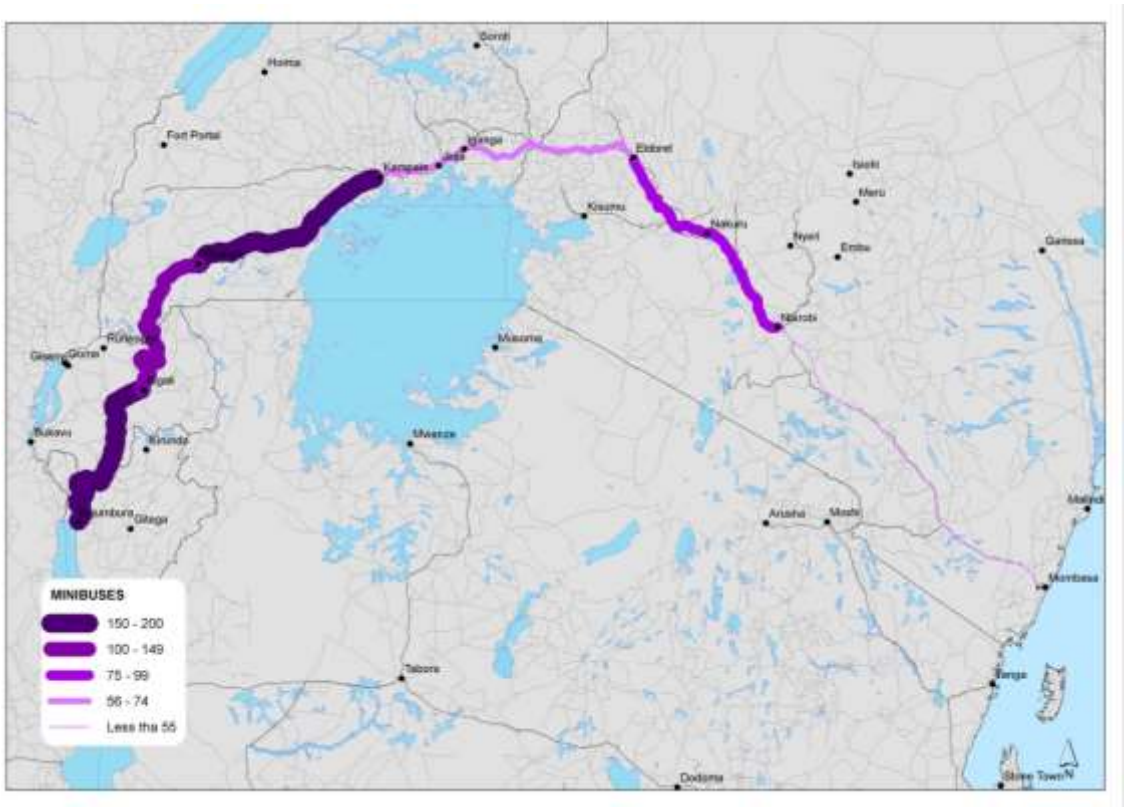
It can be pointed out that the traffic recorded in the section Kigali-Bujumbura amounts to 20% of that recorded in the section Mombasa-Nairobi.

TRUCKS

In the case of truck traffic, a continual decrease can be seen in all sections from Mombasa to Bujumbura.

So, while the average daily traffic for trucks from Mombasa to Nairobi is 1,187 trucks, between Kigali and Bujumbura the number is 193. This figure represents 16% of the average traffic on the section Mombasa-Nairobi.

MINIBUSES



In the case of transport by minibus, the results are different from other modes of transport that have been analysed. So, the busiest sections are first Kigali-Bujumbura, and second the sections Kigali-Mbarara-Kampala.

This is logical since it is in these sections where there is least transport by long distance buses and especially in the case of Kigali-Bujumbura, where the number of vehicles on the road is much less.

LONG DISTANCE BUSES

In the case of long distance buses, the greatest concentrations are, of course, to be found in the sections linking up the main cities: Nairobi-Kampala, first of all, and Nairobi-Mombasa, secondly.

The ratios between Kampala and Kigali are far less, with the very low figure in terms of transport on long distance buses between Bujumbura and Kigali standing out. As we have seen, in these sections transport by bus is mostly done by minibus.

Transport on long distance buses in the section Bujumbura-Kigali is just 10% of that recorded in the section Nairobi-Kampala.

As far as the ratio between heavy vehicles (trucks and long distance buses) and light vehicles (passenger cars and minibuses) is concerned, the ratio for the different sections considered in the study is shown in the following table:

	Heavy vehicles	Light vehicles	% Heavy vehicles/Light vehicles
Mombasa-Nairobi	1,265	2,049	61.77%
Nairobi-Eldoret	1,038	1,972	52.65%
Eldoret-Kampala	873	1,709	51.08%
Kampala-Mbarara	656	2,033	32.28%
Mbarara-Kigali	469	1,646	28.49%
Kigali-Bujumbura	203	567	35.86%

As can be seen, there exists 61.77% of heavy vehicles compared to the total of light vehicles on the section Mombasa-Nairobi. This percentage of heavy vehicles is one of the highest that the Consultant has obtained in traffic studies conducted in different countries in the world.

Certain future growth figures for traffic per year and per mode of transport have been estimated.

The report "Corridor Diagnostic Study of the Northern and Central Corridors of East Africa" (Nathan Associates Inc.) forecasts an increase from 21.49 million tons of cargo in 2009 to 35.26 million tons in 2015 and 89.58 million tons by 2030. This represents an annual traffic growth of 8.6% for the period 2009-2015 and 6.4% for the period 2016-2030. For the period 2031-2040 we have estimated an annual growth of 4.2%, according to this trend.

On the other hand, the report "Central Corridor – One Stop Inspection Stations" (Nicholas O' Dwyer & Co. Ltd.) foresees an increase in the passenger traffic of 1.9% compared with the goods traffic for the period 2010-2015 and an increase of 0.6% for the period 2016-2040.

Therefore, the annual growth figures in the Northern Corridor for future horizons are as follows:

Year	Passenger Cars	Trucks	Minibuses	Buses
1-5	10.51%	8.61%	10.51%	10.51%
6-20	7.01%	6.41%	7.01%	7.01%
21-30	4.82%	4.22%	4.82%	4.82%

A greater dynamism in growth is seen in truck and minibus traffic, and somewhat less in traffic involving passenger cars and long distance buses.

Finally, it can be emphasised that a fairly homogenous peak hour factor has been obtained for the entire corridor and that, aggregated, a value of 15% can be considered on a unitary basis.

2.5. SURVEYING OF EXISTING FACILITIES ALONG THE NORTHERN CORRIDOR

The main criterion to select roadside stations has been the mapping of the current stop points along the Northern Corridor and its main extensions.

This analysis has been done through a survey of the existing facilities. The main aspects determined through this survey have been:

- Existing capacity
- Adequacy of amenities
- Weaknesses
- Needs of enhancement
- Possibility of modal interchanges
- Rest facilities
- Truck assistance

A relevant point has been the determination of the relationship between the current RSSs and the existing traffic volumes in order to determine the size and scale of the future roadside stations.

The Team carried out different trips along the Northern Corridor:

- Four consultancy members carried out the trip from Mombasa to Nairobi, Eldoret, Kampala, Mbarara, Kigali, Bujumbura and border to DRC (2013)
- A social and environmental expert did this same trip (2013)
- An engineering expert did the trip from Kampala to Juba (South Sudan) (2013)
- Other experts did the surveys “Section Mau-Summit-Kericho-Kisumu-Busia” and “Ntungamo-Mirama Hills/Kagitumba-Kigali” (2013)
- Representatives of TTCA-NC and TYPSA carried out a new surveying of facilities in 2014, in order to review and improve the preliminary selection of RSSs. The trip of this team covered the sections Mombasa-Bujumbura, Tororo-Kumi, Kampala-Gulu, Mbarara-Mirama Hills-Kigali, Kigali-Goma, Goma-Kigali-Huye-Kitabi-Kayanza, Bujumbura-Bukavu

An identification of the main stop points along the Northern Corridor has been elaborated with the information collected in these trips. The description of these points is exposed hereinafter, together with the information obtained from the local communities.

The information obtained includes (in the majority of the cases):

- Description of the point
- Services and Facilities
- Sketch of the point
- Photos

The result of this process is shown in the second volume of this study.

2.6. SELECTION OF POTENTIAL LOCATIONS

With all the criteria explained before, we have selected the preliminary locations for a series of needed Roadside Stations along the Northern Corridor.

The used criteria are explained hereinafter:

Management and Legal Requirements for RSSs

If the purpose of the RSSs is to develop a facility that is not just a rest house with parking facilities and sanitation but is a project with a much broader focus that is integrated and symbiotic with the local community then there must be broad stakeholder involvement in the decision and planning process as well as in the management of the facility. A top-down approach would simply not work and would not yield the range of benefits that are envisaged for the RSSs. Obviously, one size does not fit all and the RSSs must be adapted to suit local conditions and moreover community expectations. If we assume that they will have a broad mandate including the range of facilities outlined in the pilot projects above, then a number of coherent steps need to be taken including:

a) Site Selection:

Whilst the Michinoeki approach was used for the selection of the two pilot sites in Kenya, the present study anticipates using multi-criteria analysis for the choice of optimum locations. This will be more sophisticated but nevertheless the goals are the same and the basic criteria used will be similar.

A range of factors need to be taken into account when identifying sites including:

- Traffic volumes
- Average driving speeds over sections of the Corridor
- Location aspects including proximity to key junctions on the Corridor and network
- Economic activities in neighbouring communities
- Availability of labour force
- Distances between RSSs
- Development projects underway or planned
- Accessibility and availability of land
- Environmental impact
- Proximity to border crossings, weigh bridges, police control points
- Proximity to garages and fuel stations
- Willingness of the local community to participate in the project
- Availability of finance
- Sustainability

b) Stakeholder Involvement

This point is critical and there will initially be some reticence on the part of nearby communities not to participate since they will perceive as a threat to their current activities and sources of income. It is important, therefore, that community leaders and interest groups are consulted before the sites are selected. Other stakeholders who will need to be involved from the start will be the local authorities, the road administrations, the local health department, environmental agencies etc. and local landowners and businesses.

This will also be fundamental to the financing of the projects including both the initial construction costs and the long term operating costs. Some estimate of the potential

benefits in monetary terms will need to be made to assess whether the RSSs are viable and can ultimately be self-supporting.

c) Range of Facilities

In the discussion above, alternative functions were foreseen for the RSSs some being multi-functional, others being primarily focused on rest houses and restaurant facilities and others being broader and market oriented and linked to the local communities. It may be that there will be a hierarchy of facilities, some fairly basic and generating revenues primarily as guesthouses whilst others will be multi-dimensional with an overarching development objective.

In defining each of the RSSs activities, there needs to be community involvement and a clear plan of what is required and its potential impact established. Once this has been agreed then the planning stage can start. When the designs are made, then the planning permission will be needed and the appropriate legal framework set in place for construction, management and operation.

d) Driving time and distance between stops

Another criterion for defining RSSs is the requirement of drivers considering the driving times and the consequent needs for parking spaces to rest.

As said, according to the European Directive on driving time the maximum hours of driving are 9 with 4.5 hours of driving time. The traffic act in Keya stipulated 8 hours within 24 hours for commercial vehicles.

For the location of RSSs, the 4.5 hours of driving time seem appropriate.

Considering the distance between sections and an average speed of 30 km/h, we can calculate the time required for completing the sections.

If we use a driving time of 4.5 hours among stops, we can obtain the number of stops in all the sections. The number of trucks in the sections, together with the number of stops, gives the number of trucks x stops per day. Applying a peak hour factor of 15% we can determine the number of parking spaces required in all the sections.

Section	Distance (Kms)	Time (hours)	Trucks	Driving time (hours)	Number of stops in the section	Number of trucks x stops	Parking spaces required
Mombasa-Nairobi	445.7	14.86	1,187	4.5	3.30	3,919.33	588
Nairobi-Eldoret	283.2	9.44	943	4.5	2.10	1,978.90	297
Eldoret-Kampala	307.9	10.26	781	4.5	2.28	1,782.24	267
Kampala-Mbarara	252.7	8.42	596	4.5	1.87	1,115.62	167
Mbarara-Kigali	255.8	8.53	415	4.5	1.89	786.35	118
Kigali-Bujumbura	261.5	8.72	193	4.5	1.94	374.49	56

Section	Distance (Kms)	Time (hours)	Trucks	Driving time (hours)	Number of stops in the section	Number of trucks x stops	Parking spaces required
Total							1,493

Therefore, the number of parking spaces considering a driving time of 4.5 hours is 1,493.

Considering the information gathered during the field trip and the criteria set out above, an initial selection has been made regarding the proposal for roadside stations.

This pre-selection is as follows:

- 1. Mombasa exit roundabout: The major volume of truck traffic in the vicinity of Mombasa, together with the difficulties in parking trucks, make it advisable on an initial basis to locate a roadside station at this point.
- 2. Concentration space for trucks 2.7 Km from the Mombasa exit roundabout: This point is very close to the Mombasa exit roundabout; therefore trucks parked in this point would be able to be located in the previous roadside station.
- 3. Kenol Station: This industrial zone has a high concentration of containers and trucks. It is sufficiently important for proposing the location of a roadside station at this point.
- 4. Miritini: Miritini is a suburb of Mombasa located 11 kilometers from the city of Mombasa. There is enough space to locate a RSS.
- 5. Mariakani Junction. The total absence of space at this point makes it wholly inadvisable to locate a roadside station here.
- 6. Mariakani, about 6 kms from the previous crossing. If there is space available, this point could be a suitable site for relieving the shortcomings of the previous point.
- 7. 1 km from the previous point there is a filling station with some parked trucks, which could easily be located in the previous station.
- 8. Samburu: At this point an analysis has been made of the possible location of a roadside station. Nevertheless, this point is not so much used by truck drivers as the Mariakani or Taru points (the following point), since at the moment of taking the measurements there were 6 trucks parked at this point compared to 35 parked in the other two points mentioned. So, owing to the closeness of the previous and following stations, it is proposed not to select Samburu as a roadside station.
- 9. Taru: For the reasons stated in the above point, and owing to the availability of space, Taru is proposed as a possible roadside station.
- 10, 11. Mackinnon Road I and Mackinnon Road II: There are two possible points for locating a roadside station in the vicinity of Mackinnon Road. Although there is space available in both points, the second point has a large number of available services and is already being used as a long distance bus stop. In this case, a possible roadside station in Mackinnon Road II is proposed.
- 12. Maungu: This point has a considerable concentration of services and parked trucks. There is a also a large enough plot of land, and it is therefore proposed as a possible roadside station.
- 13. Voi: The number of trucks parked at this point is not great, though as there is sufficient space it is proposed as a possible roadside station.

- 14. Manyani: There exists a greater concentration of trucks at this point than in the previous case, and there also exist a good number of services that have already been created, which means that Manyani can be considered as a possible roadside station.
- 15. Mtito Andei: There exists a large concentration of services at this point, as well as available space. This point is proposed as a possible roadside station.
- 16. Daru Salam: In Daru Salam there is a large plot of land available, which could be used as a possible roadside station.
- 17. The police checkpoint at 23 kilometres from Daru Salam could be located in this station.
- 18. In the same way, the space for sale of typical products and for the parking of trucks could be created in the following station (Makindu)
- 19. Makindu: In Makindu there exists a large available space and several services, so it could be pre-selected as a possible place for the creation of a roadside station.
- 20. Kiboko/Simba: In spite of being a major point of concentration of services, this point is not currently being used by local truck drivers. These services can be easily relocated in the previous and following stations along the corridor.
- 21. Emali: This point displays a major concentration of services, though the number of trucks is not very great. It could be considered as a possible roadside station.
- 22. Sultan Hamud: There exists a large yard at this point which is much used by truck drivers as a current stopping place. There are also a large number of services. KeNHA, together with MoTI, Safeway Right and North Star Alliance are already developing a RSS in this point. Therefore we must include it as a point for RSS.
- 23. Police checkpoint 6 kilometres from Sultan Hamud, which could be included in it.
- 24. Salama: There does not exist any available plot of land here and nor is it currently being used by trucks, so it is discarded as a possible site for a roadside station.
- 25. The police checkpoint 22 kilometres from the next station (Machakos Junction) could be moved to here.
- 26. Machakos Junction: This point is widely used by truck drivers going to Nairobi as a parking and resting place for spending the night. A large roadside station is proposed at this point.
- 27. The police checkpoint 17 kilometres after Machakos Junction could also be moved to this point.
- 28. Entry into Nairobi: At this point there are trucks parked illegally, which could also be moved to the Machakos Junction station.
- 29. Exit from Nairobi: There also exist trucks parked at the exit from Nairobi in the direction of Eldoret which could be relocated in Machakos Junction.
- 30. Mai Mahiu: This point does not belong to the Northern Corridor, though trucks are banned from using the Northern Corridor between Nairobi and Naivasha and they have to take the road that passes along this point, using Mai Mahiu as a stopping place.
- 31. Naivasha: At this point there is a large plot of land which could be used as a stopping point for trucks coming from Mai Mahiu.
- 32. The police checkpoint located 5 kilometres de Gilgil could be relocated to this point.

- 33. Gilgil weighbridge: This weighing point takes in a large volume of trucks each day which form a long queue along the road. As there is a large plot of land in the vicinity, a roadside station would be able to be located so that trucks can wait in proper conditions of comfort and quality.
- 34. Gilgil: The services existing along the road in the vicinity of Gilgil could be relocated in the previous roadside station.
- 35. Nakuru: The important city of Nakuru could be an excellent location for a roadside station. These exists a large number of services at this point, a considerable volume of parked trucks and a sufficient plot of land for housing all these facilities.
- 36. Salgaa: Another important point in terms of concentration of trucks. As in Sultan Hamud KeNHA, together with MoTI, Safeway Right and Northstar Alliance are already developing a RSS in this point. Therefore we must include it as a point for RSS.
- 37. Mau Summit: In Mau Summit there is a large concentration of parked trucks and an appreciable volume of services, and it is therefore proposed as a candidate for a roadside station.
- 38. Burnt Forest: A major concentration of parked trucks takes place at this point, primarily trucks on their way to Eldoret and which use Burnt Forest as a point for spending the night. It could be an excellent location for a roadside station.
- 39. Eldoret: At the entrances and exits to and from the city there are various concentration points of parked trucks that could be located in the Burnt Forest station. The number of trucks parked continuously amounts to 3 kilometres.
- 40. Jua kali: There exists a large concentration of services at this point, as well as a considerable number of parked trucks. It could be a good candidate for locating a roadside station.
- 41. Webuye: This point also records a large number of trucks passing through each day. There also exists a large plot of land available which could be used as a roadside station.
- 42. The trucks parked 12 kilometres from Webuye could be relocated to this station.
- 43. There is a police checkpoint 4.2 kilometres from Malaba (the following station), which could be located in that station.
- 44. Malaba: At this border point long lines of trucks form up waiting to cross the border. There is also a large concentration of parked trucks. This site needs to have a roadside station so that the trucks can wait to carry out the customs checks under proper conditions.
- 45. Busia junction (Busitema): There exists a plot of land available at this point, which could provide support for the Malaba facilities. A roadside station could be proposed for this point.
- 46. Naluwerere: In Naluwerere there also exists a plot of land which is currently used for parking trucks.
- 47. Idudi: The same thing occurs in Idudi, a point located 17 kilometres from Naluwerere. A study for the location of roadside stations could be made at both points.
- 48. Mbiko: There exists a small concentration of trucks parked in this point.
- 49. Lugazi: This important node for the concentration of traffic and services close to Kampala could become converted to a roadside station. There exists a large plot of land at this point that could be used for that purpose.

- 50. Kampala: The large number of trucks parked illegally in the entrance and exit to and from Kampala could be relocated to Lugazi or Buwama stations.
- 51. Buwama: At this station, 62 kilometres from Kampala, there exists an appreciable concentration of trucks. It could also be used as a stopping point for trucks illegally parked on the outskirts of Kampala.
- 52. Lukaya weighbridge: This weighing point records a major amount of traffic of almost 600 trucks a day. There exists an appreciable number of parked trucks, and a large plot of land available where a roadside station could be housed.
- 53. Masaka road: Major stopping place for buses and minibuses. There also exist a significant number of services of all kinds. A roadside station could be created here, not just for trucks but also for passenger traffic.
- 54. Kinoni: A large number of trucks congregate at this point, though there is no space available for creating a roadside station, and it is therefore discarded as a possible location.
- 55. Lyantonde: In Lyantonde there is indeed space available for locating a roadside station, and it is therefore proposed as a possible solution. It could house trucks parked in Kinoni and Kyazanga.
- 56. Biharwe: This point is located 7 kilometres from a weighbridge and just 10 kilometres from the city of Mbarara, so it would be desirable to locate a roadside station at this point which could accommodate the truck weighing and parking facilities for trucks on their way to Mbarara.
- 57. Weighbridge which could be relocated to Mbarara
- 58. Mbarara, with trucks parked illegally which could be reallocated in a legal RSS.
- 59. Nyeihanga: Point located 31 kilometres from Mbarara with an appreciable concentration of trucks. It could be proposed as a roadside station.
- 60. Ntungamo: At this point there exists a large plot of land available where a roadside station could be located.
- 61. Rubaare: Major town in terms of population and services, where a roadside station could be located.
- 62. Kabale: This town is one of the most important in terms of concentration of trucks on the route to Kigali. It is located a little over 21 kms from the border with Rwanda, so it could take in trucks parked on the border in the event that it is not possible to locate a roadside station at this latter point.
- 63. Gatuna (Uganda-Rwanda border): At the border there is a concentration of parked trucks waiting to undergo the migration and customs checks. It would be a good idea to have a roadside station so that trucks can wait to carry out these checks comfortably and safely.
- 64. Rukomo: A concentration of trucks is produced in this city in Rwanda. There is enough space for locating a roadside station.
- 65. Nyacyonga: Town close to Kigali which could be used as a parking place for trucks on their way to the capital. It is just 9 kilometres from Kigali.
- 66. Kigali: In Kigali there is a considerable concentration of buses and minibuses, as well as of parked trucks. It could be thought to create a roadside station at the entrance to the city, though there does not appear to be sufficient space for this.
- 67. Muhanga (Gitarama): Important city on the route to Burundi. Nevertheless, there is not any space close to the road for creating a roadside station.

- 68. Ruhango: At this point there indeed exists sufficient space for creating a roadside station, though the traffic in this section is much less than in the previous sections.
- 69. Butare: Butare is one of the most important towns on this route. There exists a slight concentration of trucks and sufficient space for locating a roadside station.
- 70. Akanyaru (Rwanda-Burundi border): There is not sufficient space on the border between the two countries for creating a roadside station, nor does there exist an appreciable volume of traffic justifying it.
- 71. Kayanza: Concentration of trucks on the road to Bujumbura, which justifies the location of this station.
- 72. Bugarama: Important point to take care of trucks coming into town which are not allowed to move between 6pm and 6 am.
- 73. Bujumbura: In Bujumbura there does indeed exist a concentration of trucks and buses in the station which would justify the location of a roadside station. There is limited space for it.
- 74, 75, 76. Proposed sites in the route Busitema-Kisumu: Korinda Junction, Sega Town and Yala (other sites identified in the route are Tegunot, Chepseon, Brooke bond, Awasi and Nyamasaria are already being promoted by KeNHA).
- 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88. Proposed sites in the route Tororo-Juba: Kumi, Lira, Kamdini, Gulu, Atiak and Elegu in Uganda and Nimule, Pageri-Loa Mission, Magwi, Nasitu 2, Nasitu and Juba in South Sudan.
- 89, 90, 91, 92, 93, 94. Proposed sites in the route Juba-Kaya: Gorom, Ganji, Kenyi, Longa-Mere, Bazie and Kaya
- 95, 96, 97, 98, 99, 100, 101. Proposed sites in the route Kampala-Oraba: Migeera, Karuma, Purongo, Pakwach, Arua and Oraba, Extension to Mahagi in DRC.
- 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114. Proposed sites in the route Mbarara-Kisangani: Ishaka and Mpondwe in Uganda and Kasindi, Beni, Oicha, Komanda, Lolwa, Mambasa, Epulu, Molokai, Niania, Bafwasende and Kisangani in DRC.
- 115, 116, 117. Proposed sites in the route to Bunia: Mahagi, Fataki, Bunia.
- 118, 119, 120. Proposed sites in the route to Ary: Isiro, Ariwara, Ary
- 121, 122, 123. Proposed sites in the route Kisangani-Bukavu: Lubutu, Walikale, Kamanyola
- 124, 125, 126, 127. Proposed sites in the route Beni to Goma: Butembo, Lubero, Kanyabayonga, Rutshuru
- 128, 129. Proposed sites in the route Goma-Bukavu: Moniva, Kavumu
- 130, 131, 132, 133, 134. Proposed sites in the route Ntungamo-Ruhango via Mirama Hills: Mirama Hills in Uganda and Kabarore, Kayonza, Ryabega and Rugende in Rwanda.
- 135, 136. Proposed sites in the route Kabale-Goma: Bunagana in Uganda and Goma in DRC.
- 137, 138. Proposed sites in the route Butare-Bukavu: Kitabi in Rwanda and Bukavu in DRC.
- 139, 140, 141, 142. Proposed sites in the route Bujumbura-Bukavu/Kasongo: Uvira, Namoya, Baraka, Kasongo

Therefore, 117 sites have been pre-identified as possible RSS.

Considering the study of the traffic in the corridor and the use made by current users of the corridor of the different stopping points, data obtained during the activity of surveying existing facilities and through interviews with the different stakeholders, the essential basic information has been obtained for the dimensioning of these roadside stations.

The information that has been obtained is:

- Traffic at these points, measured in average daily traffic of passenger cars, trucks, minibuses and buses.
- Percentage of vehicles stopping at those points with respect to the volume of traffic on the road.
- Combining the traffic with the percentage of vehicles which stop gives the number of daily vehicles which would use each of the proposed roadside stations.
- Using certain uniform ratios of vehicles occupancy, the number of daily users of each of the pre-selected roadside stations can be obtained. The ratios of use are:
  - Passenger cars: 2 passengers per vehicle
  - Minibuses: 10 passengers per vehicle
  - Large buses (long distance): 30 passengers per vehicle
  - Trucks: 1 passenger per vehicle
- The peak hour factor: as has already been explained, a peak hour factor of 0.15 has been obtained which is homogeneous for the entire main route.
- Average length of stay in each stopping point: This length of stay has been obtained primarily as a result of interviews held with the local communities and via a visual inspection conducted at different times of day at each stopping point.

The results obtained are the following:

a) Traffic

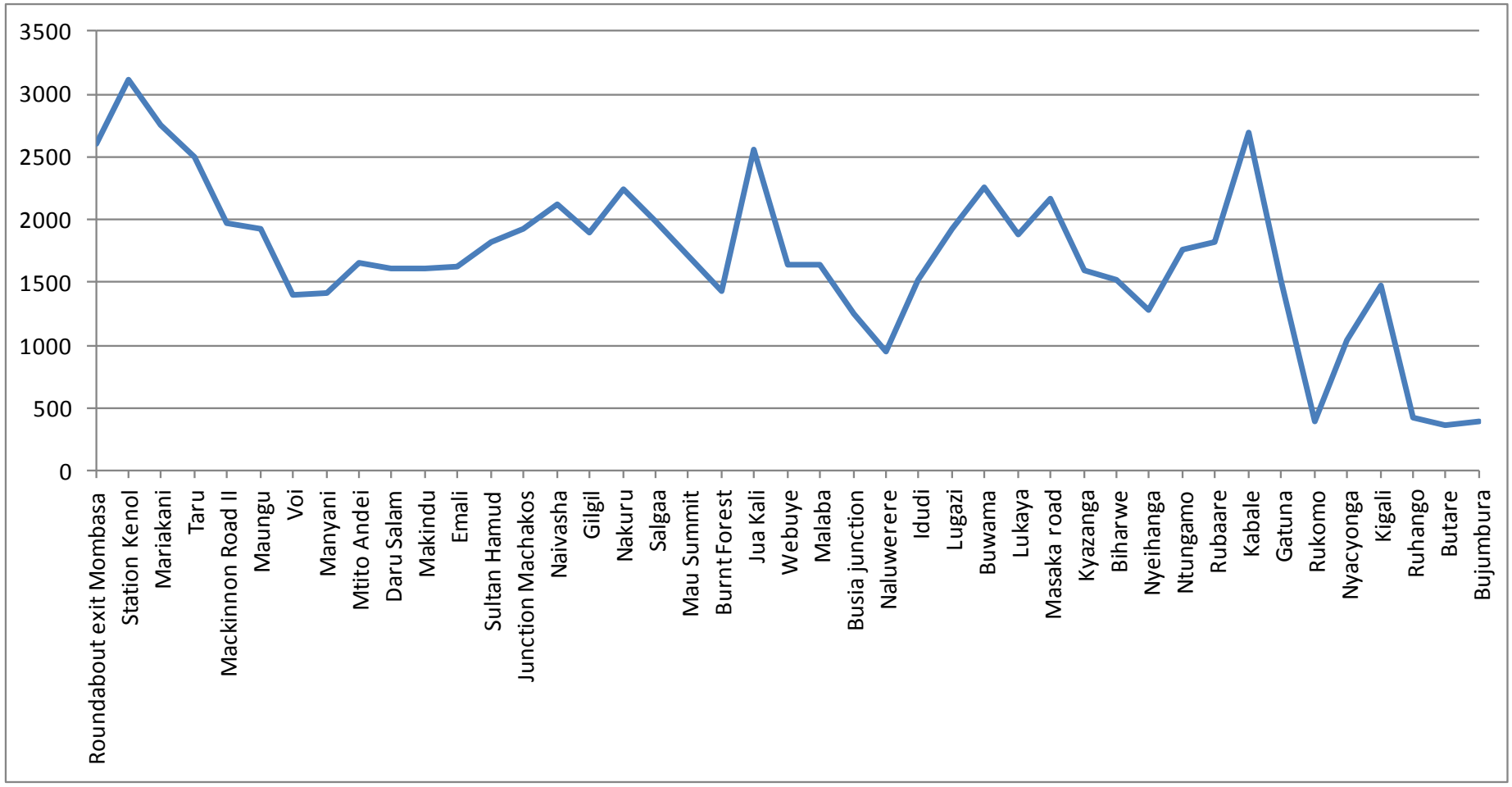
The following graphs show the variation in traffic volumes in the corridor Mombasa-Bujumbura and for the different transport modes being considered.

As has been seen previously in the study of the demand in the corridor, the greatest volumes of passenger cars and trucks are to be found in the initial sections of the corridor starting from Mombasa, and they gradually become reduced towards the end in Bujumbura, excluding the effect of passing through major cities such as Nairobi, Kampala and, to a lesser degree, Kigali.

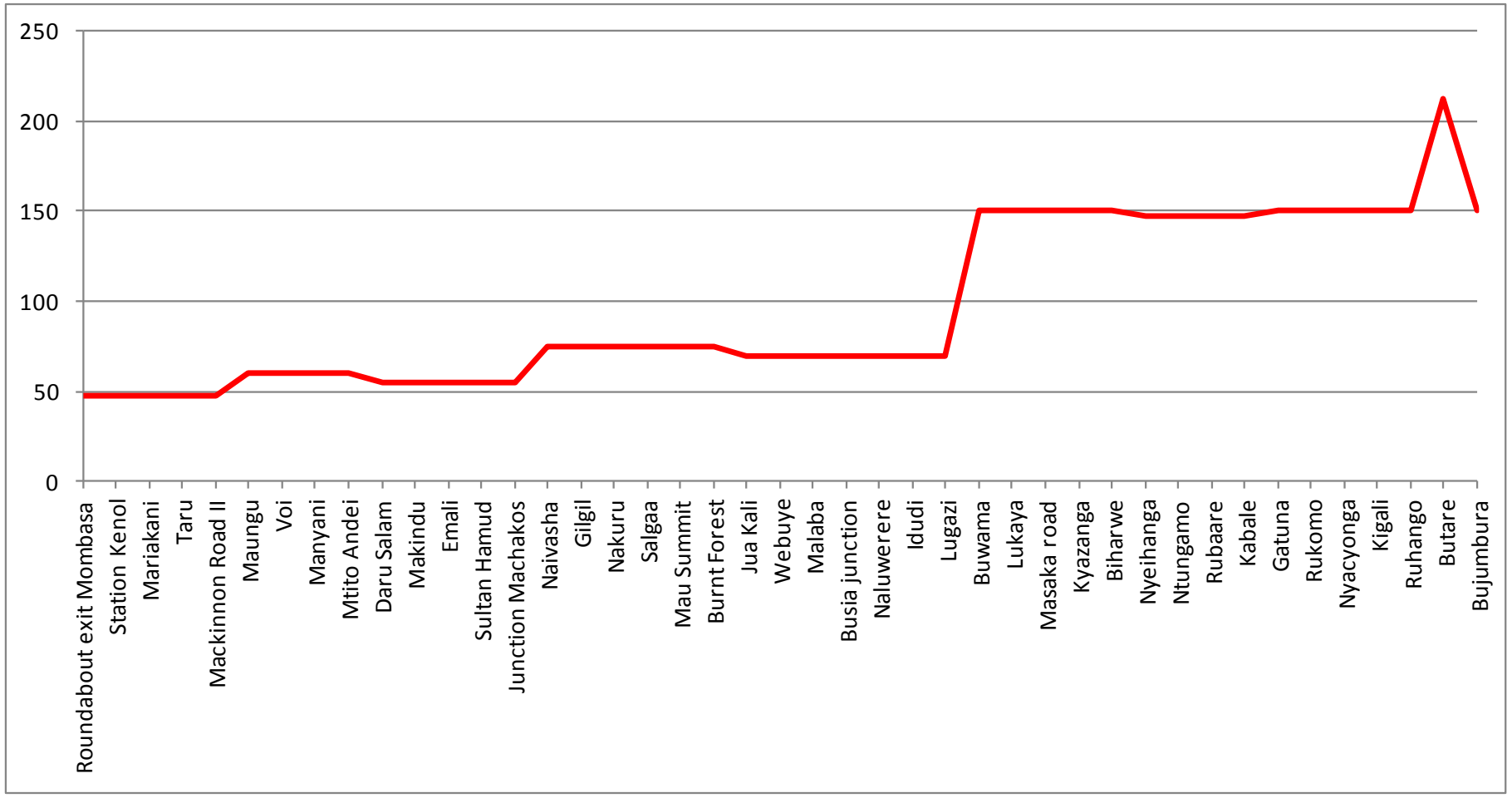
In long distance buses the effect of large cities is more pronounced, with a greater concentration of buses occurring in them. In minibuses, the effect is the other way round, since where there exists a smaller volume of passenger cars and long distance buses, the volume of minibuses is generally higher. This mode of transport to a large degree makes up for the deficiencies observed in other modes.

Nevertheless, as shown by the graphs per station, significant differences are to be found in terms of volume of traffic detailed for each of these stations, which will be taken into account during the multi-criteria analysis conducted in order to make the final selection of roadside station proposed in this study.

TRAFFIC OF PASSENGER CARS



MINIBUSES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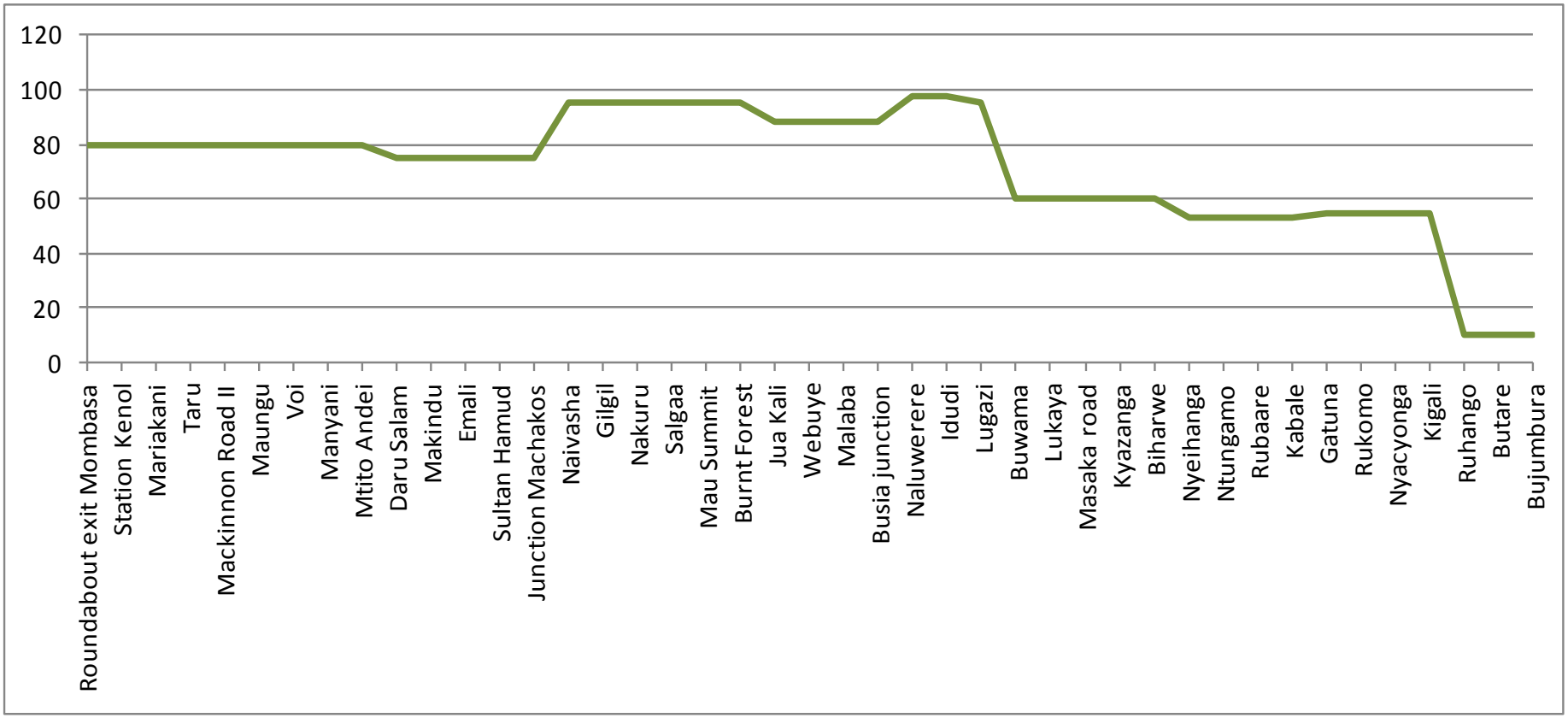
Mackinnon Road II
Maungu
Voi
Manyani
Mtito Andei
Daru Salam
Makindu
Emali
Sultan Hamud
Junction Machakos
Naivasha
Gilgil
Nakuru
Salgaa
Mau Summit
Burnt Forest
Jua Kali
Webuye
Malaba
Busia junction
Naluwerere
Idudi
Lugazi
Buwama
Lukaya
Masaka road
Kyazanga
Biharwe
Nyeihanga
Ntungamo
Rubaare
Kabale
Gatuna
Rukomo
Nyacyonga
Kigali
Ruhango
Butare
Bujumbura

BUSES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80
60
40
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Taru
Mackinnon Road II
Maungu
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Manyani
Mtito Andei
Daru Salam
Makindu
Emali
Sultan Hamud
Junction Machakos
Naivasha
Gilgil
Nakuru
Salgaa
Mau Summit
Burnt Forest
Jua Kali
Webuye
Malaba
Busia junction
Naluwerere
Idudi
Lugazi
Buwama
Lukaya
Masaka road
Kyazanga
Biharwe
Nyeihanga
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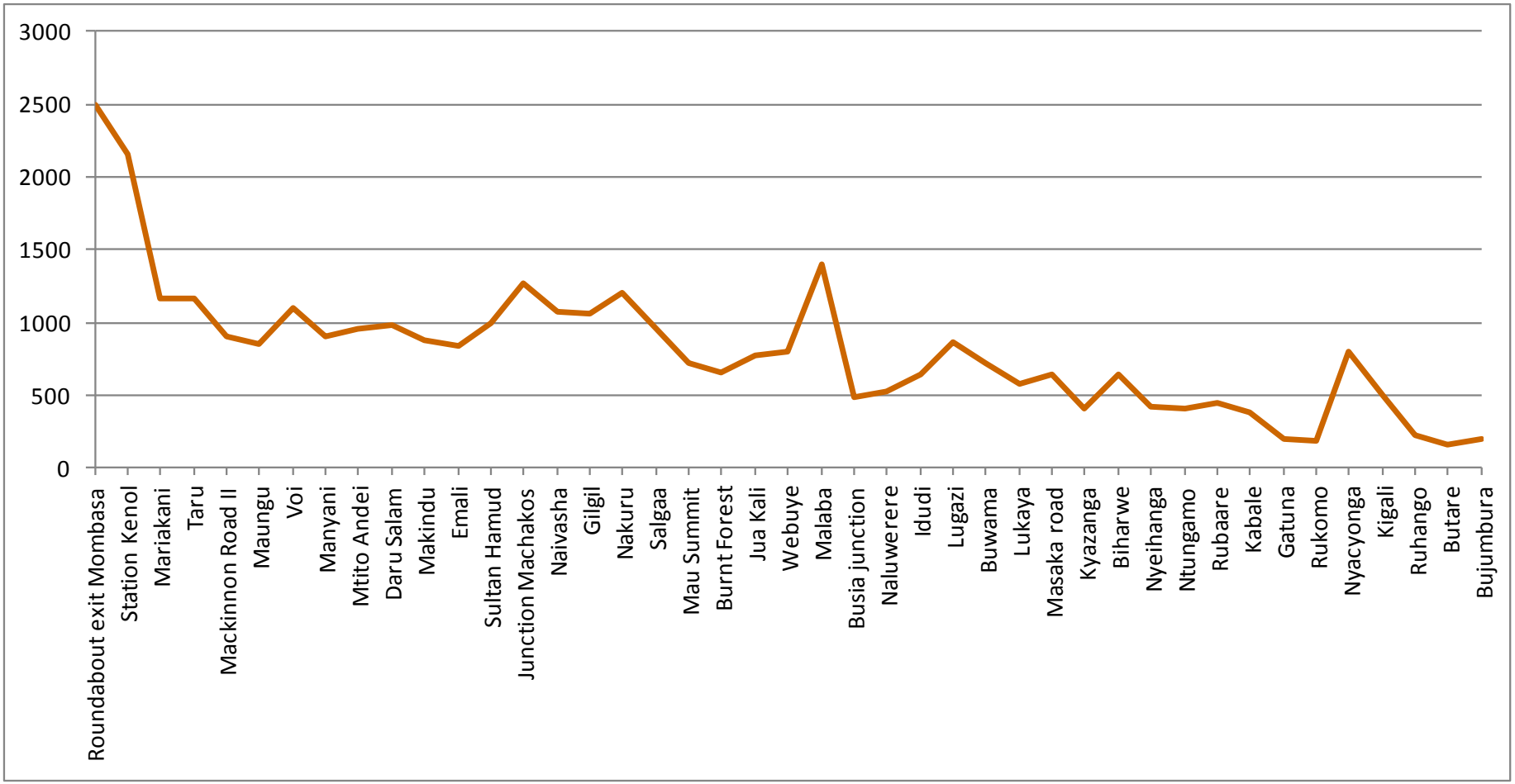
Rubaare
Kabale
Gatuna
Rukomo
Nyacyonga
Kigali
Ruhango
Butare
Bujumbura

TRUCKS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Station Kenol
Mariakani
Taru
Mackinnon Road II
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Voi
Manyani
Mtito Andei
Daru Salam
Makindu
Emali
Sultan Hamud
Junction Machakos
Naivasha
Gilgil
Nakuru
Salgaa
Mau Summit
Burnt Forest
Jua Kali
Webuye
Malaba
Busia junction
Naluwerere
Idudi
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Buwama
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Masaka road
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Biharwe
Nyeihanga
Ntungamo
Rubaare
Kabale
Gatuna
Rukomo
Nyacyonga
Kigali
Ruhango
Butare
Bujumbura

b) Specialisation of each station according to transport mode

By means of a visual inspection that was made and interviews held with stakeholders, it has been possible to determine which transport modes stop at each of these points and therefore which transport modes would be most likely to use each of the pre-selected stations.

The results are:

- Stations intended exclusively for truck traffic
- Stations intended for mixed traffic of passenger cars, trucks, minibuses and buses
- Stations intended for minibus, bus and truck traffic
- Stations with minibus and truck traffic
- Stations for passenger car, minibus and truck traffic

c) Percentage of vehicles which could stop in each station with respect to the volume of traffic on the road

As has already been mentioned, the percentage of vehicles which could stop in each station has been obtained from the ratio between the volume of traffic on the road and the vehicles stopped at each of the different points during the course of the day. Also, this information has been confirmed with interviews held with the local communities.

The results are:

- In stations intended for passenger car traffic, the volume of stops that could be recorded is estimated to be approximately 20% of the total volume of traffic on the road.
- In stations suitable for minibus stops, the percentage of vehicles stopping represents 25% of the total volume of minibus traffic, with the exception of Masaka Road station, which is an extremely important stopping focus for minibuses and buses on the corridor, and where around 80% of the volume of minibuses on the road stop, and Kigali and Bujumbura stations, where approximately 70% of the volume of minibus on the corridor stop.
- In relation to buses, the figures are more variable. In general they vary between 25% and 30%, with the exception of the above cases of Masaka Road (80%), Kigali (100%, all buses stop in the station) and Bujumbura (70%). The high percentage of Kabale (40%) also stands out.
- Finally, the stopping percentages of truck traffic vary a great deal from one station to another. In Gatuna 50% of the trucks passing through stop there, while in Voi just 2% of stops are recorded.

d) Average length of time parked

In general, the average stopping time is 30 minutes for passenger cars and 1 hour for minibuses, buses and trucks. Nevertheless, there exist exceptions:

Minibuses and buses stop for just 30 minutes in Manyani, but in Kigali and Bujumbura stations the stopping time is 6 hours.

Trucks stop for 30 minutes in Voi and Daru Salam but they have a longer stopping time in stations close to major cities, where they usually spend the night (2.5 hours in Sultan Hamud, 6 hours in Machakos Junction, 2.5 hours in Naivasha, 1.5 hours in

Gilgil on account of the weighbridge, 6 hours in Burnt Forest, 2.5 hours in Kabale, 3 hours in Kigali and 6 hours in Bujumbura).

The example of the calculation carried out for one the of pre-selected stations (Nakuru), together with its characteristic parameters, distance between the previous station and the existing services in the vicinity of the stopping point is shown in the following table. Also shown is information on the existence or not of an available plot of land for locating the roadside station and its dimensions. A preliminary calculation is also included for the number of parking spaces that would be needed in the roadside station according to the current number of users per day, the concentration factor in the peak hour and the average length of stay in the station.

The charts for other RSSs (in which detailed data have been obtained) are included in the volume 2.

12	Data	Percentage of vehicles stopping	Number of vehicles stopping daily	Average number of passengers	Number of users per day	Rate of concentration at peak times	Average length of time parked (hours)	Number of parking spaces	Services	Available space
NAME OF THE STATION	Nakuru								Sales area (vegetables), Truck services, Petrol stations, Restaurant, Bar, Hotel, Parking, Security, Toilets, Parking for buses	YES: 100 x 100 = 10000 m^2
PASSENGER CARS	2240	20%	448	2	896	15%	0,5	34		
MINIBUSES	75	25%	19	10	188	15%	1	3		
LARGE BUSES	95	25%	24	30	713	15%	1	4		
TRUCKS	1200	20%	240	1	240	15%	1	36		

2.7. MULTICRITERIA ANALYSIS (MCA)

Starting from the roadside stations pre-identified in the previous section, a multi-criteria analysis has been conducted for selecting the roadside stations which will finally be proposed in this study. The rest of locations for possible RSSs will be studied at a later stage (second phase).

It can be pointed out that a large part of the roadside stations described in the previous section are considered to be very necessary for the users of the Northern Corridor, so it is not thought to be appropriate to discard a large number of the proposals that have been set out above.

The number of parking spaces required as a consequence of the establishment of a maximum driving time (1.493) has also been considered.

The criteria that have been chosen for the multi-criteria analysis are the following:

- Existence of a minimum plot of land where the roadside station can be located: YES or NO
- Minimum distance between roadside stations serving the same transport mode: a minimum distance is considered of 25 kms
- Location at a point currently having at least a certain minimum use by travellers on the Northern Corridor: A minimum of 5 trucks parked during the peak hour is considered as the minimum threshold of use.
- Social/Legal considerations: Consideration is given to the existence of a local community in the vicinity of the proposed location as a requisite for the sitting of a roadside station. Also, there may be legal constrains, as the impossibility of locating RSSs near weighbridges.
- Urban development considerations: In cases where a roadside station is proposed inside a city, an analysis has been made of the impact that the proposed RSS will have on the surroundings, checking whether the proposal is admissible or not in urban development terms.

The result of the analysis is shown in the following table. The green colour shows that the station meets the established criteria and red shows that the station fails to meet those criteria.

	SITE	DISTANCE	USE	SOCIAL/LEGAL	URBAN
R. exit Mombasa					
Station Kenol					
Miritini					
Mariakani					
Taru					
Mackinnon Road II					
Maungu					
Voi					
Manyani					
Mtito Andei					
Daru Salam					
Makindu					
Emali					

	SITE	DISTANCE	USE	SOCIAL/LEGAL	URBAN
Sultan Hamud					
Junction Machakos					
Mai Mahiu					
Naivasha					
Gilgil					
Nakuru					
Salgaa					
Mau Summit					
Burnt Forest					
Jua Kali					
Webuye					
Malaba					
Busitema					
Naluwerere					
Idudi					
Mbiko					
Lugazi					
Buwama					
Lukaya					
Masaka road					
Lyantonde					
Biharwe					
Mbarara					
Nyeihanga					
Ntungamo					
Rubaare					
Kabale					
Gatuna					
Rukomo					
Nyacyonga					
Kigali					
Ruhango					
Butare					
Kayanza					
Bugarama					
Bujumbura					
Korinda Junction					
Sega Town					
Yala					
Kumi					
Lira					

	SITE	DISTANCE	USE	SOCIAL/LEGAL	URBAN
Kamdini					
Gulu					
Atiak					
Elegu					
Nimule					
Pageri-Loa Mission					
Magwi					
Nasitu 2					
Nasitu					
Juba					
Migeera					
Karuma					
Purongo					
Pakwach					
Arua					
Oraba					
Mahagi					
Ishaka					
Mpondwe					
Kasindi					
Beni					
Ochia					
Komanda					
Lolwa					
Mambasa					
Epulu					
Molokai					
Niania					
Bafwasende					
Kisangani					
Mirama Hills					
Kabarore					
Kayonza					
Ryabega					
Rugende					
Bunagana					
Goma					
Kitabi					
Bukavu					
Gorom					
Ganji					

	SITE	DISTANCE	USE	SOCIAL/LEGAL	URBAN
Kenyi					
Longa Mere					
Bazie					
Kaya					
Fataki					
Bunia					
Isiro					
Ariwara					
Ary					
Lubutu					
Walikale					
Kamanyola					
Butembo					
Lubero					
Kanyabayonga					
Rutshuru					
Moniva					
Kavumu					
Uvira					
Namoya					
Baraka					
Kasongo					

As can be seen in the above table, the only stations rejected due to not having the minimum space for being able to locate a roadside station are Station Kenol and Gatuna. Both RSSs are discarded.

In relation to a minimum distance between roadside stations for the same transport mode, the following results have been obtained:

- The stations of “Mombasa exit roundabout” and “Miritini” are very close together (9 kilometres apart). Owing to the existence of a larger plot of land in Miritini it is proposed as a station and the “Mombasa exit roundabout” station is discarded. The number of parking spaces in this station goes from 65 to 140.
- Mackinnon Road II station is just 13.86 kms from Taru station, but as it also houses passenger cars, minibuses and buses as well as trucks, it is considered necessary to keep it.
- Daru Salam is located just 6 kms from Mtito Andei. As it is currently more used than the latter, it is preferred to keep Mtito Andei and discard Daru Salam. The number of parking spaces in Mtito Andei goes from 13 to 15.
- Sultan Hamud is 13.2 kms from Emali. Nevertheless, truck drivers make much greater use of the Sultan Hamud area than of Emali, so it is preferred to keep Sultan Hamud and discard Email. The number of parking spaces in Sultan Hamud goes from 60 to 72.

- Mau Summit is located 23.37 kms from Salgaa. However, Salgaa also houses passenger cars, minibuses and buses as well as trucks. Therefore it is considered necessary to keep both RSSs.
- Idudi is located 14.38 kilometres from Naluwerere but both stations are needed due to the same reason than in the previous point.
- Ntungamo is located 23.8 kms from Nyeihanga. The plot of land at Ntungamo is much bigger, as is the number of services present in the vicinity, therefore Ntungamo station is selected. The number of parking spaces in this station comes to be 22.
- Rubaare is only 18.5 kms from Ntungamo. Therefore Rubaare us removed.
- Biharwe is located only 12.75 kms from Mbarara, but the categories of traffic served by them are different. Both RSSs are kept. The same applies to Kabale and Rukomo (21.25 kms of distance)

Of the remaining stations, only the Gilgil and Mariakani RSSs fail to meet the social/legal criterion of local community presence. They are weighing points without any local presence or activity of any kind, so it is proposed to discard these stations. Furthermore, according to the legal framework, it is not recommended to locate RSSs near the weighbridges.

Finally, the only stations with urban insertion problems would be Kigali and Bujumbura. In Kigali there exists a very important bus station with a great deal of activity, and a parking zone for trucks facing the station which complies with the functions of a roadside station. The plot of land that has been marked as available is the actual plot that is currently being used. Therefore, instead of constructing a roadside station en Kigali, it is proposed to carry out improvement and upgrading works on the existing station. The situation is similar in Bujumbura where there exists a bus station (with enormous shortcomings in terms of infrastructure) although there is no station for parking trucks. The parking spaces for minibuses and buses in Kigali and Bujumbura would be kept in the existing stations.

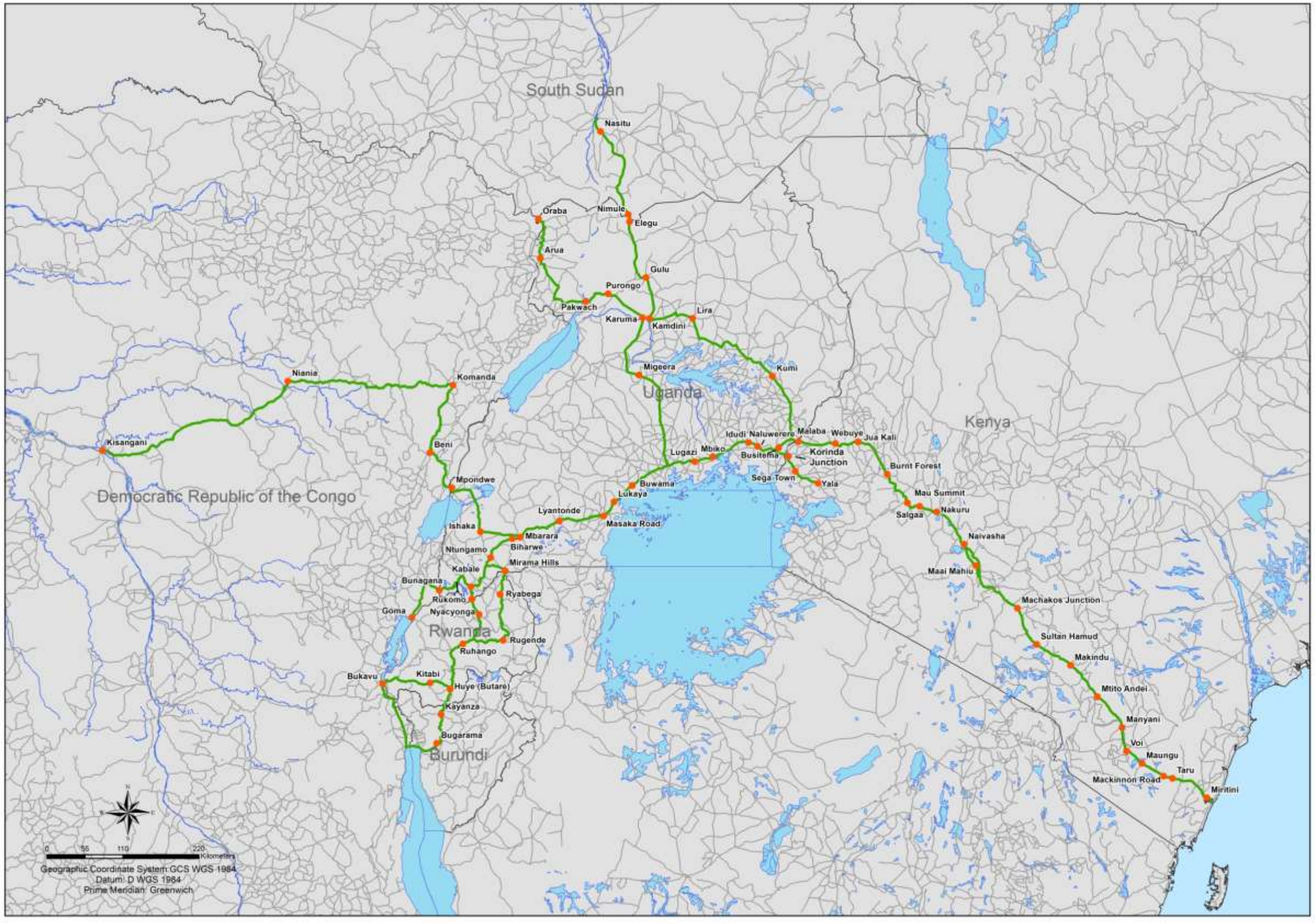
In relation to the current minimum use for the proposed stations, there are 39 stations proposed by the Authorities of the countries that do not reach the minimum use established as a prerequisite.

The stations are Atiak, Pageri-Loa Mission, Magwi, Nasitu 2, Juba, Mahagi, Kasindi, Ochia, Lolwa, Mambasa, Epulu, Molokai, Bafwasende, Kabarore, Kayonza, Gorom, Ganji, Kenyi, Longa Mere, Bazie, Kaya, Fataki, Bunia, Isiro, Ariwara, Ary, Lubutu, Walikale, Kamanyola, Butembo, Lubero, Kanyabayonga, Rutshuru, Moniva, Kavumu, Uvira, Namoya, Baraka and Kasongo.

As said, these stations will be considered at a later stage.

As a total, 50 RSSs out of 117 have not passed the Multi Criteria Analysis. Therefore, 67 RSSs are proposed to be implemented.

The maps of these 67 RSSs and the distances among them are shown as follows.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Oraba
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Elegu
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Gulu
Purongo
Pakwach
Karuma
Kamdini
Lira
Migeera
Kumi
Uganda
Kenya
Niania
Komanda
Kisangani
Beni
Democratic Republic of the Congo
Idudi
Naluwerere
Malaba
Webuye
Jua Kali
Lugazi
Mbiko
Busitema
Korinda Junction
Burnt Forest
Sega Town
Yala
Buwama
Lukaya
Mau Summit
Salgaa
Nakuru
Lyantonde
Masaka Road
Ishaka
Mbarara
Naivasha
Ntungamo
Biharwe
Mirama Hills
Maai Mahiu
Kabale
Bunagana
Ryabega
Machakos Junction
Rukomo
Goma
Nyacyonga
Rwanda
Sultan Hamud
Rugende
Ruhango
Makindu
Bukavu
Kitabi
Huye (Butare)
Mtito Andei
Kayanza
Manyani
Bugarama
Voi
Maungu
Burundi
Taru
Mackinnon Road
Miritini
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Kilometers
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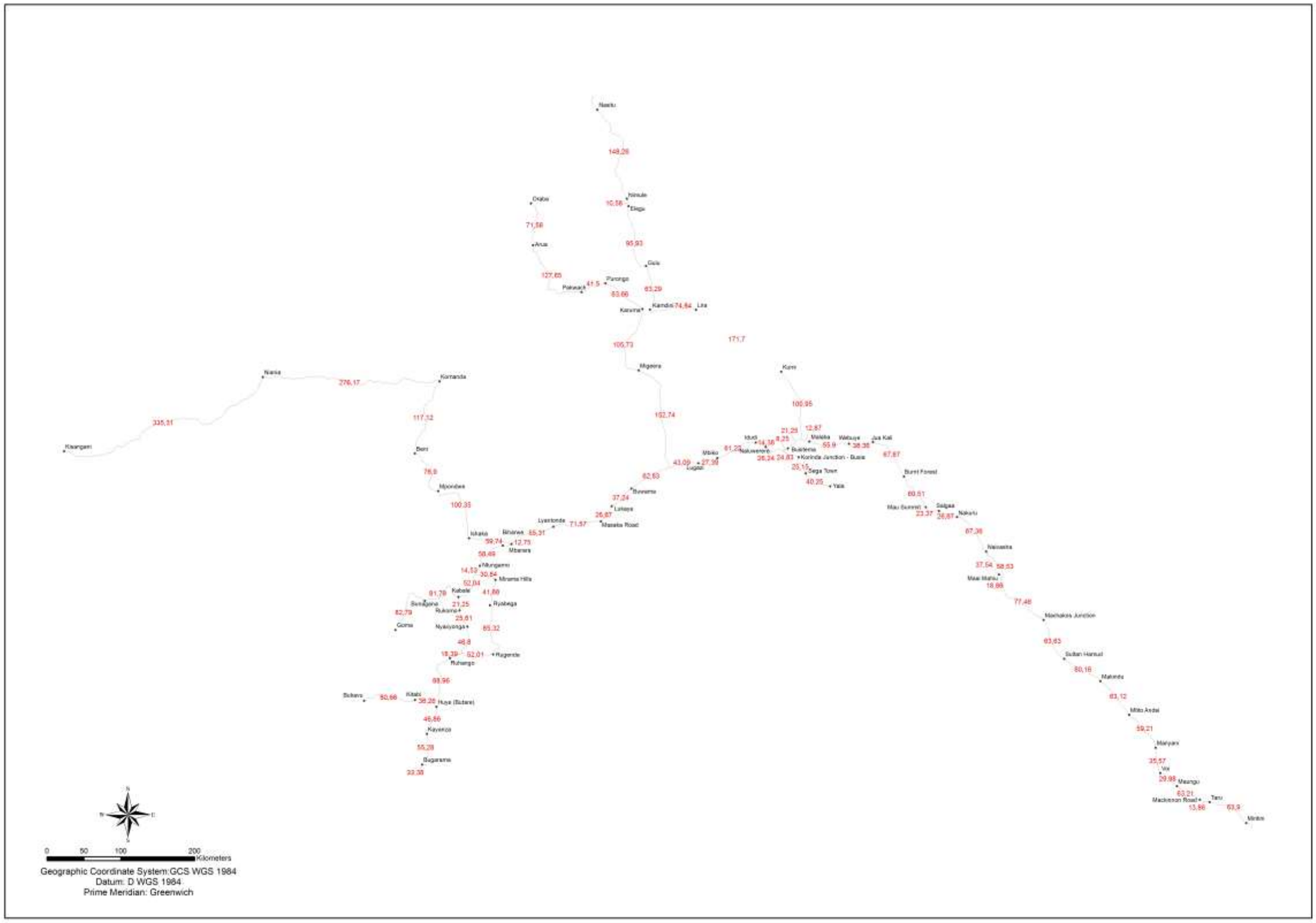
Prime Meridian: Greenwich


Nasitu
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Arua
95,93
Gulu
127,65
Pakwach
41,5
Paronga
63,66
63,29
Karuma
Kamdini
74,64
Lira
105,73
171,7
Migeera
Kumi
Nania
276,17
Komanda
335,31
Kisangani
117,12
Beni
76,9
Mpondwe
100,35
102,74
100,95
21,25
12,87
Iduda
14,36
8,25
Malaba
Webuye
Jua Kali
Mbiko
61,23
Nakawerere
55,9
38,36
Busitema
43,09
27,39
Lugazi
26,24
24,83
Korinda Junction - Busia
67,87
25,15
Sega Town
Burnt Forest
40,25
Yala
62,63
Buwama
60,51
37,24
Lukaya
Mau Summit
Salgaa
23,37
26,87
Nakuru
Lyantonde
71,57
26,87
Masaka Road
Ishaka
Biharwa
55,31
59,74
12,75
Mbarara
67,36
58,49
Naivasha
Ntungamo
14,53
30,84
Mirama Hills
37,54
58,53
Maai Mahiu
52,04
18,88
91,79
Kabale
41,88
Buhigana
21,25
Ryabega
77,46
82,79
Rukomo
25,61
Goma
Nyakyonga
85,32
Machakos Junction
46,8
18,39
52,01
Rugende
Ruhango
83,63
Sultan Hamud
80,16
68,96
Makindu
Bukavu
80,66
Kitabi
38,28
Huye (Butare)
83,12
Mtito Andei
46,86
Kayenza
59,21
Manyani
55,28
Bugarama
35,57
33,38
Voi
29,98
Maungu
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Mackinnon Road
Taru
13,86
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Miritini
N
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0
50
100
200
Kilometers
Geographic Coordinate System:GCS WGS 1984
Datum: D WGS 1984
Prime Meridian: Greenwich

The distance from each RSSs to Mombasa is shown in the following table:

	Distance from Mombasa (Kms)
Miritini	11.00
Taru	74.90
Mackinnon Road	88.76
Maungu	151.97
Voi	181.93
Manyani	217.50
Mtito Andei	276.71
Makindu	339.83
Sultan Hamud	399.95
Machakos Junction	463.58
Naivasha	599.57
Maai Mahiu	559.90
Nakuru	666.93
Salgaa	693.60
Mau Summit	716.97
Burnt Forest	777.48
Jua Kali	845.35
Webuye	883.71
Malaba	939.61
Busitema	973.73
Naluwerere	1,008.22
Idudi	1,022.60
Mbiko	1,083.82
Lugazi	1,111.21
Buwama	1,217.13
Lukaya	1,254.37
Masaka Road	1,281.04
Lyantonde	1,352.61
Biharwe	1,407.92
Mbarara	1,420.67
Ntungamo	1,479.16
Kabale	1,545.73
Rukomo	1,566.98
Nyacyonga	1,592.59
Ruhango	1,657.78
Butare	1,746.74
Kayanza	1,793.62
Bugarama	1,848.90
Korinda Junction	1,006.81
Sega Town	1,031.96

	Distance from Mombasa (Kms)
Yala	1,072.21
Kumi	1,053.43
Lira	1,225.13
Kamdini	1,299.97
Gulu	1,363.26
Elegu	1,459.19
Nimule	1,469.77
Nasitu	1,618.03
Migeera	1,307.04
Karuma	1,309.97
Purongo	1,373.63
Pakwach	1,415.13
Arua	1,542.78
Oraba	1,614.34
Ishaka	1,467.66
Mpondwe	1,568.01
Beni	1,644.91
Komanda	1,762.03
Niania	2,038.20
Kisangani	2,373.51
Mirama Hills	1,524.53
Ryabega	1,566.41
Rugende	1,651.73
Bunagana	1,627.52
Goma	1,710.31
Kitabi	1,783.00
Bukavu	1,863.66

3. RSS MODEL DESIGN

3.1. DIMENSIONING OF ROADSIDE STATIONS WITH FULL TRAFFIC DATA

Having selected the roadside stations that are going to form the general programme to develop, the next step is to carry out their design and estimate the costs of building them.

In 26 of the 67 RSSs, we have obtained full data of traffic and we have been able to prepare a detailed design of the RSS.

In the other 41 RSSs, the traffic data is more general. Therefore, we need to use standard designs.

Based on this full dimensioning we have determined three standard model designs for RSSs according to their size: Large, Medium and Small. These standards can be applied for the dimensioning of future RSSs.

As a standard for the big RSS we have chosen Kabale station, for the medium size RSS we have chosen Biharwe station and for the small RSS we have chosen Buwama station.

These RSSs are good in shape, have several activities and the internal maneuverability is excellent.

The RSSs have been place alternatively on both sides of the roads (right hand side and left hand side) in order to facilitate the access to all the users. The RSSs are always located at least 30 m from the highway, in order to avoid interferences with future widening of the roads.

The process for designing the 26 RSSs in which we have full and detail traffic data is exposed as follows. The process of using standard designs for the other 41 RSSs is explained in the next chapter.

The basic conditioning factors in design terms are:

- Parking spaces according to transport mode: The number of parking spaces in each roadside station according to the transport mode has been obtained with the parameters explained in the previous point, in other words with the percentage of vehicles that stop in the station referring to the total volume of traffic on the road, with the average number of users according to the transport mode (which gives us the number of users of the station), with the peak hour factor and with the average stopping time in the station.

  In some RSSs, parking spaces have been reserved for trucks in transit. These parking spaces have been separated from the parking spaces for domestic cargo by means of a fence.

  Some of these parking spaces could be used for trucks carrying dangerous goods. The following measures should be implemented in case that dangerous goods use these parking areas:

  - Parking area exceeding 2,000 m2.
  - Parking area watched 24 hours
  - Delimitation of parking spaces exclusively for dangerous goods vehicles.
  - Sufficient distance between the parking lot of dangerous goods and the roads and the villages
  - Sign posts of parking for dangerous goods.

- Parking places characteristics, such as enough width, separation between spaces by cones, etc..
- Information on parking utilization standards.
- Lighting.
- Fire extinguishers.
- Alarm.
- Self-protection plan

The total number of parking spaces foreseen is 1,427, similar to the number required with a driving time of 4.5 hours (1,493).

- Services and/or facilities to implement: In theory, the services or facilities available in the vicinity of the current stopping points have been considered as the starting point for the design of each roadside station. Nevertheless, some minimum services are planned to be to implemented independently of whether or not they currently exist:
  - Toilets: It is considered essential that all roadside stations have toilets.
  - Restaurants: Virtually all the roadside station will have a restaurant area, even if it is small in some cases. The only station not to have a restaurant is Miritini since it is too congested and serve traffic that is essentially urban.
  - Shops: All roadside stations will have an area for shops, since all the areas surrounding the stopping points that have been analysed have shopping areas to a greater or lesser extent.
  - Health clinics/Wellness and Emergency response centres: Improving the sanitary conditions along the corridor is a fundamental objective in the implementation of the present roadside stations programme. So, there will be a Health Clinic every 3 roadside stations at most, though in fact the Health Clinics are very often going to be more continual than this since the currently existing clinics are going to be retained. In Kenya, this health clinic will include a wellness centre and an emergency response centre.
  - Bank/Bureau office: Either a bank or a bureau office is proposed in virtually all roadside stations so that users can conduct their business and even transfer money, which is a service that all the local communities that were interviewed have demanded. In the few cases in which neither a bank nor a bureau office is proposed, it is because there exists a permanent office in the vicinity of the proposed location.
  - Bar: Small bars which in some cases complement the existing restaurants are proposed in some roadside stations. Their introduction is in response to the existence of small bars or kiosks in the current vicinity. These bars will not be allowed to sell alcoholic drinks.
  - Car workshop: In stations where cars are expected to stop, it is proposed to locate a small workshop for mechanical repairs.
  - Cleaning of trucks: It is proposed to introduce a truck cleaning service every 2-3 roadside stations. The conditions of the roads are bad, with a lot of dust and sand on them, causing vehicles to frequently become dirty which hinders driving conditions. This is another service much in demand from local communities.
  - Hotel: A fundamental objective of the roadside stations is that they should allow drivers to rest, preventing conditions of fatigue which can increase the danger of driving and the number of accidents. Hotels are therefore

provided every 3 roadside stations at the most. The number of hotels will very often be greater due to respecting the existence of hotels in the vicinity of the current stopping points.

- Petrol station: It is considered essential that all roadside stations should have a petrol station.
- Police checkpoint: The police checkpoints hinder driving conditions on the road and, especially, they considerably increase journey times. As far as possible, it is proposed to transfer these points to the nearest roadside station. Therefore, some roadside stations will have a space for being able to carry out these police controls.
- Recreational area or Community centres/Administrative offices: Another objective of the roadside stations is to serve the development of the local communities. Therefore, some roadside stations will have a recreational area so that local communities can hold meetings and so that they can also to act as a gathering point. In other cases, these areas can act as administrative offices in order to carry out migration and/or customs functions which were able to be transferred from the cross border points.
- Security services: Roadside stations used by truck drivers for spending the night will have a specific area housing the necessary security services in the stations. This area will also be provided in stations where these services already exist at present.
- Services to trucks (repairs): It is important to have truck repair services in places where a greater concentration of them is to be found. So, these services are proposed with a reasonable frequency in the selected roadside stations.
- Supermarket: It is proposed to have supermarkets spaced out along the roadside stations. The present existence of supermarkets at the stopping points is also taken into account.

In most of the cases these facilities have been put under a common roof and with special pavement, in order to separate them from the parking area. Nevertheless, due to specific regulations, it is not possible to locate all these facilities in the same buildings.

On the other hand, the design criteria are:

- Dimensions of the parking spaces. In theory, these dimensions have been considered per space:

RATIOS	m^2 (including access routes) of parking space per vehicle
Cars	15
Minibuses	50
Buses	70
Trucks	70

- Nevertheless, the real surface areas for parking for each roadside station have been obtained once the design for those stations has been done, since the areas around the access routes have very often been optimised.

- Toilets: A ratio of 0.14 toilet units per parking space has been used. This ratio is the one used in the Michinoeki guide for the design of roadside stations. Later on, a ratio of 2 m^2 per toilet unit has been used, which gives us the total surface area of toilets in each roadside station.
- Restaurants: The restaurant area has been calculated taking into consideration the number of uses of each station, a use percentage of the restaurant of 20% of users, a 30% concentration in the peak hour and an average time of remaining in the restaurant of 1 hour. In this way, the number of places needed in restaurant is obtained and, multiplying by a ratio of 3.5 m^2 per place, gives the total surface area destined for restaurants.
- The surface areas used for the remaining facilities are:
  - Shops: 200 m^2
  - Health clinic: 100 m^2
  - Bank: 40 m^2
  - Bar: 20 m^2
  - Bureau office: 20 m^2
  - Car workshop: 70 m^2
  - Cleaning of trucks and cars: 200 m^2
  - Hotel: 300 m^2
  - Petrol station: 300 m^2
  - Police check point: 25 m^2
  - Recreational area: 100 m^2
  - Security services: 25 m^2
  - Service to trucks (repair): 100 m^2
  - Supermarket: 200 m^2
- A ratio of 30% of the above surface area has also been estimated for pedestrian zones and landscaped areas, though the final surface area has arisen from the specific design for each roadside station, as is the case with internal roads.
- All these surface areas have allowed the total surface area of the roadside station to be obtained. Comparing it with the available surface area determines whether an additional surface area is needed or, on the contrary, whether there exists surplus surface area.

The dimensioning of the RSSs has been done according to the current traffic in the Northern Corridor. Nevertheless, the big traffic growth recommends developing the RSSs with some extension for future increases. In this sense, we have considered the traffic foreseen in 2020. Furthermore, we have increased the number of passengers in trucks, from 1 to 2 (driver and helper), according to the existing and future regulations. Therefore, we present the dimensioning of the RSSs for the current traffic adding the extension needed for 2020.

Presented below is the dimensioning table for one example roadside station (Nakuru), along with the plan showing the design of it.

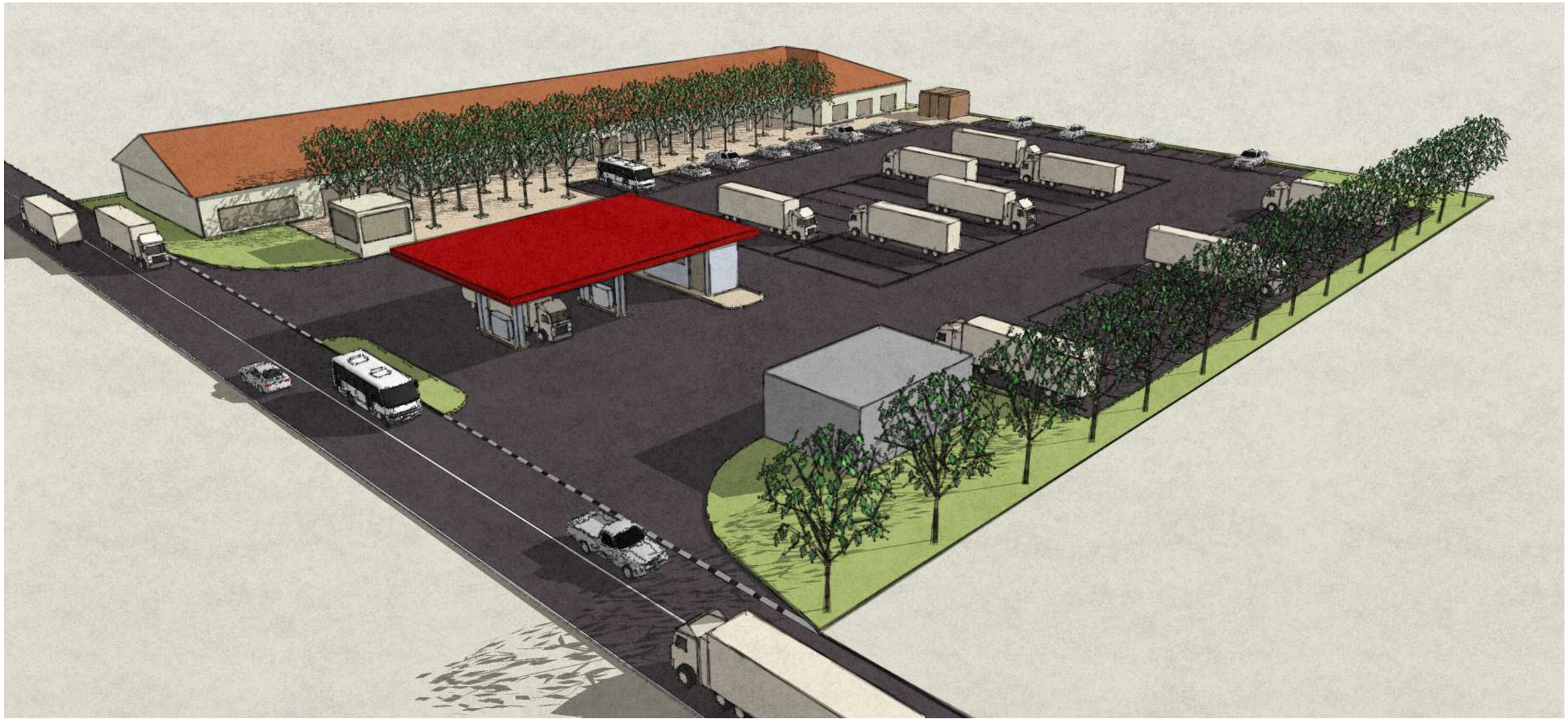
The architectural model of this roadside station is also included. This architectural model will be used to create the standardised and joint branding of the RSSs, because all the RSSs will have the same appearance in terms of designing, colors and visual image.

Other charts are included in the volume 2, together with the architectural model of another example (Mau Summit), that is similar to the one in Nakuru.

12	Traffic 2013	Traffic 2020
NAME OF THE STATION	Nakuru	
PASSENGER CARS	2240	3839
MINIBUSES	75	129
LARGE BUSES	95	163
TRUCKS	1200	1931

Parking (m^2) 2013	Parking (m^2) 2020	Toilets (units)	m^2 of toilet	Rest. (seats)	m^2 of rest.	Shops (m^2)	Health clinic (m^2)	Bank (m^2)	Bar (m^2)	Bureau office (m^2)	Car workshop (m^2)	Cleaning of trucks and cars (m^2)	Hotel (m^2)	Petrol station (m^2)	Police check point (m^2)	Recreational area / Adm. offices (m^2)	Security services (m^2)	Services to trucks (repair) (m^2)	Supermarket (m^2)	Internal Roads (m2)	TOTAL Without pedestrian and green areas	Pedestrian and green areas	TOTAL 2020	Land needed (m^2)
425	728	18	36	232	812	200	100	40	20		70		300	300			25		200	4913	10991	5455	16446	0
80	137																							
192	329																							
1728	2781																							

NAKURU STATION



Regarding the construction costs, the following ratios have been considered:

Construction costs	
Parking ($/m^2)	43.032
Pedestrian and Gardening ($/m^2)	9.78
Building ($/m^2)	391.2
Gate, Hedge, etc ($)	7,824
Deep Well Work ($)	55,420
Septic tank ($)	26,080
Water tank & Water tower ($)	20,864
Generator (100 KVA) ($)	56,072
Telephone ($)	17,474

These ratios have been extracted from similar projects in East Africa.

The same applies for the operation and maintenance cost, that are shown in the following table:

Maintenance and Operating costs (per year)	
Personnel (Secretariat for market and restaurant) ($)	6,520
Security guard/parking attendant (three persons) ($)	7,042
Repairs ($/m^2 building)	1.165
Public utilities ($/m^2 building)	9.896
Others	10% of the above four concepts

The construction, maintenance and operating costs of Nakuru station are exposed in the following table. The costs are in US $. The tables for others roadside stations are included in the volume 2.

12	Data
NAME OF THE STATION	Nakuru
KILOMETRES FROM PREVIOUS STATION	38,1
PASSENGER CARS	3839
MINIBUSES	129
LARGE BUSES	163
TRUCKS	1931

Parking	Pedestrian and gardening	Building	Others	TOTAL
382.475	53.350	940.054	183.734	1.559.612

Personnel	Security guard	Repairs	Public utilities	Others	Total
6.520	7.042	2.449	20.811	3.682	40.505

3.2. DIMENSIONING OF ROADSIDE STATIONS WITH STANDARD DESIGNS

As said in the previous chapter, we have used standard designs (Large, Medium and Small) for those RSSs in which full traffic data are not available.

The classification of each RSSs according to this standard size is shown in the following table.

	RSS	SIZE
KENYA	Voi	Large
	Maai Mahiu	Medium
	Salgaa	Large
	Webuye	Medium
	Yala	Small
	Sega Town	Small
	Korinda Junction - Busia	Large
UGANDA	Purongo	Small
	Kamdini	Small
	Gulu	Medium
	Karuma	Medium
	Pakwach	Medium
	Arua	Medium
	Oraba	Medium
	Elegu	Large
	Lira	Medium
	Idudi	Large
	Mbiko	Medium
	Lukaya	Medium
	Mbarara	Large
	Mirama Hills	Medium
	Lyantonde	Small
	Ishaka	Small
	Kumi	Small
	Migeera	Medium
	Mpondwe	Large

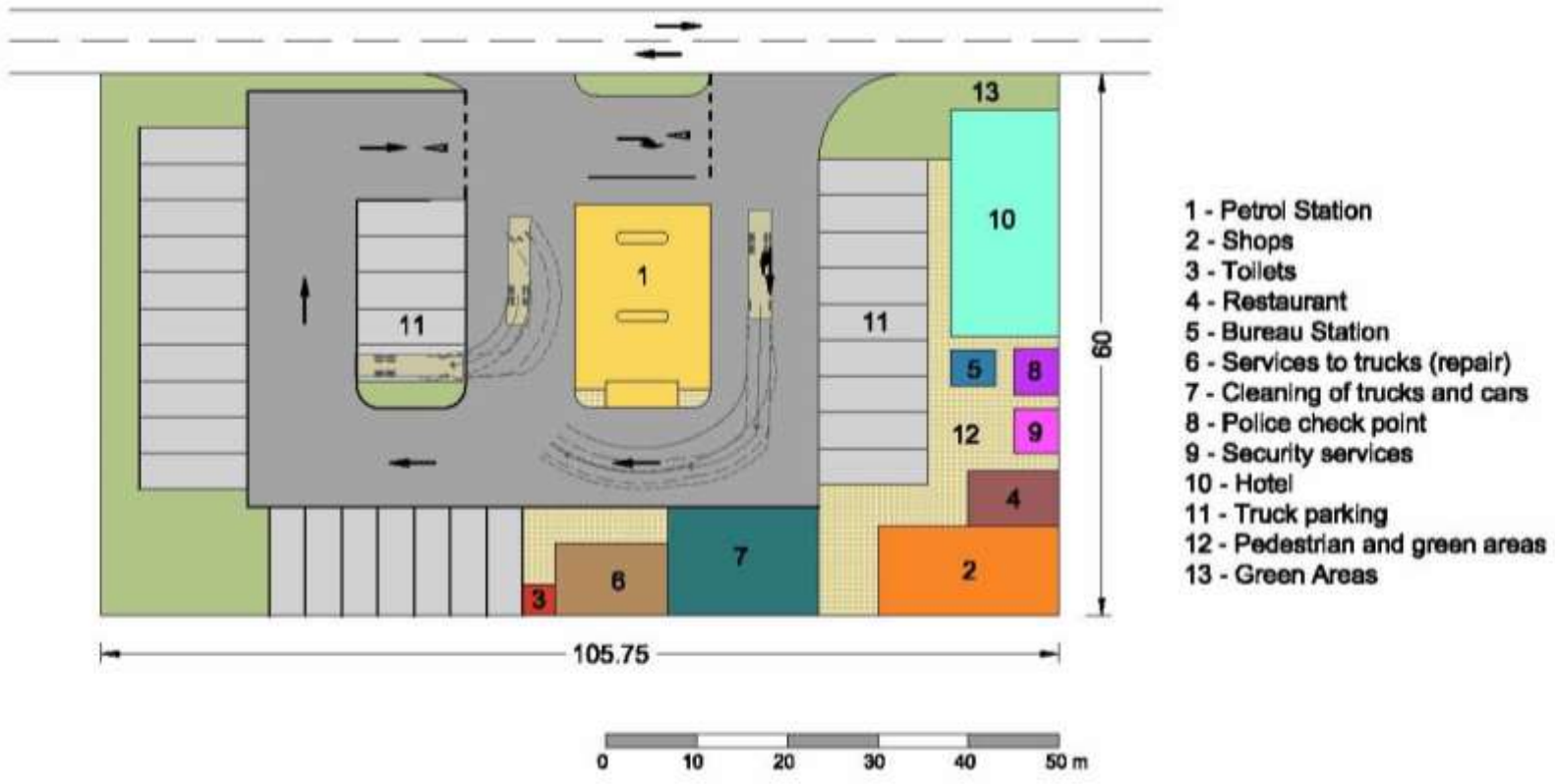
	RSS	SIZE
RWANDA	Nyacyonga	Small
	Rugende	Medium
	Ryabega	Small
	Kitabi	Small
DRC	Goma	Large
	Beni	Large
	Komanda	Medium
	Niania	Medium
	Kisangani	Medium
	Bunagana	Large
	Bukavu	Medium
BURUNDI	Bugarama	Medium
	Kayanza	Small
SOUTH SUDAN	Nimule	Small
	Nasitu	Small

The standard designs used are shown in the following drawings.

BIG RSS


150
62,625
80
1 - Petrol Station
2 - Shops
3 - Toilets
4 - Restaurant
5 - Health Clinic
6 - Car workshop
7 - Services to trucks (repair)
8 - Cleaning of trucks and cars
9 - Supermarket
10 - Hotel
11 - Bank
12 - Police check point
13 - Security services
14 - Truck parking
15 - Minibuses parking
16 - Large buses parking
17 - Passenger cars parking
18 - Pedestrian and green areas
19 - Green Areas
0 10 20 30 40 50 m

MEDIUM RSS


13
10
1
11
11
5
8
12
9
4
2
7
6
3
60
105.75
0
10
20
30
40
50 m
1 - Petrol Station
2 - Shops
3 - Toilets
4 - Restaurant
5 - Bureau Station
6 - Services to trucks (repair)
7 - Cleaning of trucks and cars
8 - Police check point
9 - Security services
10 - Hotel
11 - Truck parking
12 - Pedestrian and green areas
13 - Green Areas

SMALL RSS


11
1
7
9
11
80
9
3
6
10
2
8
5
4
92.95
0
10
20
30
40
50 m
1 - Petrol Station
2 - Shops
3 - Toilets
4 - Bureau office
5 - Restaurant
6 - Hotel
7 - Services to trucks (repair)
8 - Bar
9 - Truck parking
10 - Pedestrian and green areas
11 - Green Areas

4. ECONOMIC AND SOCIAL EVALUATION

4.1. ENVIRONMENTAL AND SUSTAINABILITY ASSESSMENT

Highways pass through communities who see these roads as having no direct benefit for them. Their unique structure and presentation gives an opportunity for interaction between road users and the local community. This opportunity has not been fully utilized.

Highway infrastructure developments can be one means of addressing the challenges of poverty especially in the rural areas, where community involvement will ensure sustainability of the services offered by the RSS, by providing the needed income in these set ups.

This activity proposes that the new RSS should be modelled to provide local people and groups with opportunity to participate in community development through the RSS. In addition despite providing economic empowerment through market functions, the RSS should be modelled to be venues of providing social services to the communities and travelers alike through medical care, HIV/AIDS counseling, education and training, cultural activities and sanitation. In this regard, the local residents also become users of the RSS when they use economic functions as well as the public functions of the RSS. This way the RSS will meet the needs of the local community and the travelers as well.

This Environmental and Social Assessment is defined to be a process of identifying and evaluating the future environmental social and economic effects of proposed RSS developments along the Northern Corridor on the environmental values of the territory as well as on the well-being of people, and their businesses, institutions and communities. The aim of this assessment is protecting and enhancing the quality of life by ensuring that negative socio-economic impacts are minimized and sound environmental decisions are made.

Social impact assessment involves identifying: significant potential positive and negative changes in peoples' cultural traditions and lifestyles, their physical and psychological health, their families, their institutions and their community. Also this assessment identifies ways of avoiding, mitigating, enhancing or managing those changes.

Once an analysis of the socio-economic and environmental factors specific to the places considered feasible for implementation of the RSS has been done, then a detailed analysis of the potential impacts that implementation of the project and its components may pose on the natural, human and economic development of these areas and their surroundings is carried out, the main results as follow.

4.1.1. MAIN EXPECTED ENVIRONMENTAL IMPACTS

Primary environmental issues relating to roadside facilities management activities are summarized as follows. It should be noted that site-specific conditions might present additional issues as it will be detailed for some particular cases. The main environmental impacts introduced for the implementation and operation of the RSS may be resumed as the following:

- Pollution of surface/underground water, soil, air, noise.
- Indirect pollution of cultivated areas and therefore crops
- Waste management (generation, handling, storage and disposal)

a) Construction phase

There are several potential negative impacts associated with the construction phase and can easily be mitigated. They include the following:

Impact to soil (soil erosion and degradation)

Site clearance and excavation activities could cause physical impacts, including creation of the dust during dry weather and silt-laden runoff during the wet season, both of which would affect flora and fauna and reduce the quality of life. Large quantities of construction material like sand, gravel and aggregate will be required for construction work. There could be impacts due to mining of materials ex-situ if the mining activities are not conducted properly.

The soils on and around the site can easily be contaminated through introduction of chemicals like cement, paints, metal chips and other construction materials. Oil spills and leakages can also contaminate the soil and change its chemical composition or the soil PH.

Air Pollution

Air emissions during the construction of the RSS would generally comprise dust and vehicular emissions. Dust would be generated as a result of various construction phase activities including:

- Clearing of vegetation and moving topsoil.
- Earthworks including embankments and cuttings.
- Wind erosion of stockpiles and unsealed haul roads and access tracks.

Air emissions from construction machinery, including dust, is regarded as a nuisance when it reduces visibility, soils private property, is aesthetically displeasing or affects palatability of grazing. The dust levels (total suspended particulates) experienced on any given construction day would relate to the nature of earthmoving activities being undertaken, the area of soil exposed, the antecedent rainfall and wind strength. Levels of particulate matter are not anticipated to be excessive with the introduction of construction management measures and are not expected to result in reduced local air quality at the nearest residences.

Smoke emission from the machines and vehicles and dust during construction can easily affect the quality of air around the project site. Dust particles emanating from excavation activities are potential causes of air pollution. Exhausts from the involved machinery will lead to increased levels of noxious gases such as sulphur, carbon and nitrogen oxides.

Noise increase

Noise is unwanted or undesirable sound that can affect job performance. The psychological effects of noise include annoyance and disruption of concentration. Physical effects include loss of hearing, pain, nausea, and interference with communications when the exposure is severe. Both heavy and light machines are sources of noise. This can be experienced both at the construction and operational stage. It is anticipated that there will be minimal levels of fumes, noise and vibrations generating activities like blasting. However, the necessary noise control measures must be enforced by the contractor.

Water Pollution

Construction debris and loose soil particles can find their way into the surface water drainages and then carried into the natural water courses. Consequently oil spillage and linkage during the operation stage can find their way into the existing water drainage systems. Hence careless handling of oils during the site preparation stage and the operation stage can result into underground or surface water pollution. Leakage from tanks, accidental spills and poor water management are potential avenues for water pollution.

This may lead to a public health deterioration as a result of indirect effects of both water, soil and air pollutions. Water borne and air borne diseases can be realized over a long period of accumulation of the chemical substance in air, soil and water.

Potable Water Supply may impact public health through potential contamination risk to drinking water quality.

Increased waste generation (both solid and liquid)

Both solid and liquid waste will be generated from the project at the construction and operation stage. Waste metal particles, chemicals, oil spills and linkages, remains of construction materials, food wrappings and food remains are all foreign materials and substances that will be introduced at the site.

The Septic System Maintenance may pose a threat of disease through improper storage or disposal of sewage, this may damage habitat through the improper location of septic systems or disposal sites near ditches, wetlands, or other significant habitat areas.

Garbage and Litter Disposal may threaten both wildlife and public safety through the attraction of wildlife to rest areas and roadside facilities and may contaminate surface waters, groundwater, and soils through improper storage or disposal of waste material. Also insects may pose a health concern in garbage receptacles.

Loss of vegetation on the site

Landscaping, excavations and the entire site preparation exercise will lead to the disappearance of the surface vegetation cover. Dumping of soil overburden and preparation of material assemblage sites will lead to the loss of the natural top vegetation cover which might be difficult to recover or regenerate.

Also invasive plants may establish at rest areas/pullouts through motorist activity & vehicles, and become a source for further spread if not treated/removed properly. May displace desirable native vegetation

b) <u>Operation phase</u>

During operation, the impacts are mainly due to resource consumption (water and electricity), generation of grey and black water (from toilet and bathroom facilities) and solid waste, and noise and air emissions due to movement of buses and other vehicles.

Water quality

Negative impacts

Surface run off from the RSS may affect quality of water. The RSS will have an impervious surface thus reducing water infiltration into the ground. This implies that surface runoff from the site will increase. The amount of runoff will increase slightly due to lowered infiltration of rainwater into the soil. The surface water from the station is likely to contain oils and greases if drainage system is not well designed.

Positive impacts

The construction of the new RSS will overcome the unsustainable situation of the current identified places in terms of lack of control of water and toxic wastes spillage, mainly coming from the vehicles that park in those places and do some maintenance works with no sort of control. In the current situation hydrocarbon contaminated waste water results from daily operations that deal with petroleum products.

However, the proponent will install oil receptors that will ensure all waste water is thoroughly treated before released to the common drainage system or to the conservancy tank with an appropriate treatment which will aid in the water purification for re use in cleaning and for watering the landscapes.

The facilitation of proper places for parking and fully equipped workshops may ensure that all water from service area and other section of the station where spills are anticipated passes through properly constructed oil interceptor. The installation of oil receptors will ensure all waste water is thoroughly treated before released to the common drainage system or to the conservancy tank. If this is done, the impact of surface run-off on the environment will be minimized.

Wastes disposal

Negative impacts

Due to an expected rise in the number of vehicles and passengers an increase of the total amount of solid waste will be produced at the RSS and cleaning of roads. However no significant impacts are anticipated during operation stage. RSS will be provided to treat waste water generated from depot activities.

Positive impacts

Again the performance of the RSS is a positive impact on introducing some control on waste disposal and collection, which comes to overcome the current situation of many stopping in which it has been proved as there is very little or no control over waste disposal.

As shown before a large number of places proposed for RSS installation are currently suffering of a serious problem of disposing of solid and liquid wastes resulting from the transport activities and associated productive sectors, with nonexistent wastes disposal facilities.

Air quality

As the new proposed use becomes effective, a variety of customers and other service seekers will be attracted to the site. This will bring in both truck and buses that will produce an increase of noise rates and air pollution that may only affect the proper RSS areas but also the surroundings.

Noise (ie. internal traffic movements and noise associated with the operation of facilities) must also be considered. Since a constant flow of traffic is expected 24

hours a day in these facilities, this impact could reach great magnitude if the RSS is located next to populated areas, towns, schools, hospitals etc. especially during the night time, ending up in a negative reaction from the communities that may jeopardize the success of the project in some locations.

On the other hand the RSS will be used by vehicles that would use the roads even without the presence of the rest areas. The RSS area would not generate additional vehicle usage on its own. Most vehicles using the site would have their ignition switched off for the duration of their stay. Some vehicles, however, may need to keep their engines or ancillary motors on (for example: refrigerated vans and trucks).

Overall, the rest area is not anticipated to result in a noticeable adverse impact to the local air quality. However, the operating of a new RSS may mean the overcoming of some chaotic situations, where the non organized traffic and non regulated parking is currently a continuous source of nuisance to the people living around the area.

Landscape

The existing visual environments are a combination of natural and cultural attributes that make up the landscape setting. Three main components of the existing visual environment which will form the basis of the visual and landscape assessment are:

- Landform types.
- Vegetation types.
- Land use.

The change in land use through the introduction of the rest area would result in a change in character of the site within the immediate vicinity.

The implementation of the RSS will have an impact on urban ecology and landscapes. Whereas before the Project the rural ecosystems are mostly represented by agricultural and rural ecological communities, it is expected that after the construction equilibrium will be shifted toward some other different activities related to the transport sector. Biodiversity of the ecosystem will be reduced even further. If no rare or endangered flora or fauna occur in the project area, no mayor impacts are anticipated.

Positive impacts

The traditional lack of urban planning that is noticeable in the environs of these places will be somewhat offset by the design of these facilities to bring rationality and order in an urban environment usually chaotic and very run down. The improvement of the current situation which is started by the execution of the RSS will result in a clear positive impact

4.1.2. MAIN EXPECTED SOCIOECONOMIC IMPACTS

The impacts on people, their community and way of life will mainly occur during construction and the commissioning phase when the RSSs will be in use. However, it is anticipated that minimal social impacts will occur during the project planning phase. These impacts will result from the introduction of specific project characteristics (e.g., acquisition of land, duration of construction) and the local community and individual's response to these characteristics. These responses will

vary greatly across different geographical areas in the seven different countries served by the northern corridor.

Highway infrastructure developments can be one means of addressing the challenges of poverty especially in the rural areas, where community involvement will ensure sustainability of the services offered by the RSS, by providing the needed income in these setups.

The implementation of the project will create short term employment to the workers and this is a contribution to the peoples' well being. The proposed project will generate both direct and indirect employment. It will directly offer jobs on temporary basis during the construction. In addition, on completion of the project a large number of persons will be employed on permanent basis.

As noted, transport plays a pivotal role in economic growth and development. The establishment of RSS in the corresponding areas will serve to improve accessibility and will play the role of attraction poles to the economic sectors thus boosting the local economy.

This Program proposes that the new RSS should be modelled to provide local people and groups with opportunity to participate in community development through the RSS.

In addition despite providing economic empowerment through market functions, the RSS should be modeled to be venues of providing social services to the communities and travelers alike through medical care, HIV/AIDS counseling, education and training, cultural activities and sanitation. In this regard, the local residents also become users of the RSS when they use economic functions as well as the public functions of the RSS. This way the RSS will meet the needs of the local community and the travelers as well.

The following section illustrates the types of socio-economic impacts that could be precipitated by the establishment of the RSS.

a) Construction phase

Expected positive social and economic impacts

The positive benefits associated with the proposed project include the following:

Employment and wealth creation for the proponent through the investment

The implementation of the project will create short term employment to the workers and this is a contribution to the peoples' well being. The proposed project will generate both direct and indirect employment. It will directly offer jobs on temporary basis during the construction. Increased formal and informal employment in both skilled and unskilled labour will mean clear short-term socio-economic benefits from the construction work if local people gain employment in the workforce.

Local youth generally shows an unskilled profile, thus higher impact on local youth employment will come from a higher unskilled labor demand, although they can become skilled laborers during their large experience over the construction period.

To ensure that these benefits are directed to local people, the Contractor should be required to employ as much of his labour force as possible from the local communities. Drawing of majority of workforce from local communities will avoid

problems that can occur if workers are imported, including social conflicts and issues of health and sanitation due to labour camps.

Rising of local economies

Regarding raise on incomes rates, wages earned by the local workers from the construction activity will circulate in the local economy and this will result in greater investments in productive endeavors and hence, contributing significantly to the growth of the local economy. Taking into account that the RSS may probably take years to complete, the construction activity and the linkages that it will create will give rise to increased demand for the supply of the locally produced goods and services.

Creation of market for goods and services

The construction of the RSS would mean the creation of market for goods and services and especially construction inputs which include raw materials and construction machinery. The linkages with the other sectors thus created are bound to give rise to increased demand for the supply of the locally produced goods and services. Indirectly therefore, the Project will contribute greatly to the rise in the income levels of the local communities and hence to poverty reduction. In a more longer term, this will result in the improved living conditions and prosperity of the local people, the reduction of the current high levels of poverty and in general, to the significant development of the areas where the RSS may be implemented.

Expected negative impacts

Influx of immigrants

During the construction phase of the RSS it is expected that there will be a large influx of immigrants into the area, e.g. project staff, those seeking skilled and unskilled jobs, itinerant traders and a motley of those providing various kinds of services. This will of course at once swell the population of the RSS sites probably making in some of the most remote places the immigrants temporarily to outnumber the local pastoralist and agricultural inhabitants.

During the operation phase of the sub-projects, most of the immigrants will leave and the population will stabilize. However, a sizeable number is expected to remain to be engaged in the vibrant economic activities created by the Project linkages. And this is likely to alter the demographic patterns of the local pastoralist communities in the long run.

Impacts on settlements

Some of the areas proposed for the setting of all RSS are very sparsely populated and as such, inhabitants in the neighboring settlements are not expected at all to be displaced by the proposed constructions and associated infrastructural installations

In the most populated areas where settlement may be affected for the project implementation, roads, camps, etc, resettlement, compensation or financial nature and/or leases of land for the development sites should be completed before starting work in accordance with laws and regulations in force in the different countries. To prevent endless discussions with the population and the significant cost of population displacement, it is advisable where possible to

make arrangements to change work routes and camp locations rather than temporal occupations.

During the construction phase of the project, there is likely to arise 3 new types of settlements around the RSS sites, viz:

(a) Labor camps – to cater for the influx of immigrants attracted to the area by prospects of job opportunities. These are likely to be demobilized upon the completion of RSS

(b) Growth of the neighboring trading centers – as the new centers of the enhanced commercial and services activities linked to the Project operations. This growth trend is expected to sustain beyond the operation phase.

(c) Establishment of homes by some of the immigrants, who may decide to settle permanently in the area.

One of the most immediate impacts of a development project – with its attendant linkages to vibrant economic activities - is steep rise in land prices as potential investors compete for suitable space to site their investments in the new land of opportunity. This has the effect of forcing out the locals farther into the interior whilst the new settlements prosper. In the long term, i.e. during the operation phase of the project, this may create a sense of resentment by the locals against the immigrants, thus jeopardizing the social cohesion among the area communities.

Disruption of Community Life Cycles

The establishment of labor camps and the emergence of new settlement patterns during the construction are likely to bring in their wake such alien lifestyles and unacceptable social practices as promiscuity, prostitution, drugs and substance abuse. This is bound to significantly interfere with the normal community life cycles and result in new types social stresses.

Residents may be disrupted and inconvenienced by detours, local road closures, dust, noise, heavy equipment traffic on existing roads, changes in the level of service, safety hazards, and interference with emergency services. Occasionally, there is vibration damage to near-by structures. However, residents may benefit from construction employment.

At the construction stage and continuing during the operation of the sub-projects, new community relations will certainly emerge in the new settlements around the sub-projects sites. Some of the immigrants will establish new settlements and economic opportunities.

On the negative side, the immigrant populations coming and settling into the area are likely to introduce unacceptable alien cultural practices, norms and values. This of course is likely to result in the dilution of the local culture and disruption of the existing traditional life cycles.

Impacts on public health

During the construction phase of the RSS, large contractors' labour camps will be established at the construction sites. Also to be expected is a large influx of immigrants into the area coming in to seek employment and other gainful economic opportunities. The labour camps and the immigrants from different socioeconomic backgrounds are bound to bring with them alien social practices

such as prostitution and promiscuous behaviour which increase the risk of HIV/AIDS infection and prevalence.

Traffic accidents increase

The works and the mess due to implementation of new RSS may also lead to an increase in the accidents ratio in the area, not only during the construction phase when the rise in the number of vehicles may produce more accidents for people and cattle knockdowns that may result in a problem in security.

The increase in the number of accident can create a strong feeling of rejection among the population that sees endanger their families and livestock leading to possible negative reactions.

b) Operation phase

The proposed RSS will directly benefit an estimated 0.8 million people along the A104 and A109 routes in Kenya, within the zones of influence of the RSS, and the wider population of East Africa in general. The majority of road users are people involved in crop farming, animal husbandry and trading, those seeking social services such as education and medical services. Other users are transporters of goods to and from the port of Mombasa and tourists to our National Parks. Administrators and social workers will also make use of the road to provide extension and outreach services.

Many positive impacts will accrue from the operations of the RSS when commissioned for use. The local residents will benefit from offering goods and services at the restaurants, lodges, cultural and information center, repair shops, etc. The RSS will increase access to jobs, while providing recreation and other community services and amenities. These effects can be reflected in increased land values.

In Kenya, rules about parking are not strictly enforced, so it is possible to find lorries parked anywhere along the Northern Corridor possing danger to other commuters and the locals of the area. However, 71% of the populace interviewed widely agrees that it is important to provide designated parking for buses and trucks, and to enforce their use.

The concept of RSS is still new, though it is practised in a rudimentary way by entities who invest in hotels and lodges that exist in towns and market centers all along the A104/A109 highway, giving services to the road users. These serve as important commercial sites where local communities sell their produce and offer goods and services at a fee. These opportunities are only available to persons with finacial ability. But the proposed RSS should bring everbody on board.

The community in Uganda appreciate that the truckers and bus operators are an important cog in the local economy and there is mutual interaction between these operators at several levels. There is investment in private parking all along the Northern Corridor, there are many retail outlets that sell wares to the truckers, and there are food vendors and hotels that sell produce to the truckers and lodges that provide accommodation, among others.

The concept of RSS is practised in a basic way by private investors with lorry parks. Most of them offer the very basic facilities, and the users have to seek for extended services like medical, telecommunication, etc from elsewhere. Model RSS should be introduced to revolutionise the concept in Uganda. These RSS will not only serve as important commercial sites where local communities sell

their produce and offer goods and services at a fee, but also provide social services to the communities and travellers alike through medical care, HIV/AIDS counselling, education and training, cultural activities and sanitation.

In Rwanda the RSS project is percieved to have many positive impacts to the communities living in the vicinity of Nyacyonga because it will generate a lot of job opportunities during its implementation and operation.

There are no environmentally sensitive or culturally/historically sensitive areas around the proposed site for the RSS. The area has been used for agriculture and livestock activities for a long time. Meanwhile, public infrastructure including roads have been developed in the area. The proposed RSS will also be in tandem with the District Development Plan which is spread out over five years (2013-2017) to provide an instrument of planning and coordination of interventions that improve the living conditions of the population in Gasabo District and to harmonize development.

Regarding Congo there are three major problems facing truckers who endeavour to cross into Congo:

- The visa to enter Congo is US$50 for strictly one week, and should a truck driver delay to exit for whatever reason including truck breakdown, the fine can be anything from US$100 per week after mishandling by the local officials. Elsewhere in East Africa the truckers get one month for the same amount.
- It is only in Congo that truckers require an immunization card before entry, failure to which one pays US$50 as fine.
- The general security problem in Congo makes truckers want to leave the country as soon as one is finished with the business that took him there.
- Congo being a geographically vast country, the nodal distance between towns is large, and therefore a trucker will cover considerable distance before getting to his destination. This long distance should be complimented with a long stay visa to enable truckers to venture deeper into the country.

For these reasons, and other reasons beyond the scope of this program, truckers to Congo prefer to stay in Rwanda or Burundi and cross over to Congo when it is convenient to go and comeback in the shortest time possible. This makes establishment of RSS in Congo not viable from a socio-economic standpoint.

Expected positive impacts

Reduction of illicit trade/Promotion of legitimate trade

It is anticipated that the RSS will provide opportunity for the local residents to interact with the travelers as they offer goods and services at a fee. This will not only improve the local economy, but will also provide services in support of the road transport sector.

Currently, the interaction between the truck drivers and the local community is perceived to have many illicit facets. For example, it is reported that local residents siphon fuel and pilfer parts from the trucks for sale locally, and exchange sex for money. A survey of the situation on the ground reveals that administrative delays at truck stops, poor working conditions, low job

satisfaction, and long working hours are some of the contributing factors to these illicit interactions. Due to these challenges truckers tend to seek entertainment during stop-overs usually involving alcohol and the trading of sex with sex workers. In fact, many sex workers rely on truckers as consistent clients, because of their access to disposable income and frequency along the corridors.

With the establishment of the RSS, these illicit interactions will be reduced significantly by improving the working conditions for the truckers. On the other hand, the local community will be gainfully engaged in providing goods and services at the RSS thereby getting opportunities to engage in economic empowerment.

Promotion of Cultural heritage

In all the centers proposed for the establishment of the RSS, there are no cultural centers. Considering that cultural matters and values are never accorded the attention they deserve, such RSS facilities will be important for the preservation of culture locally and dissemination to travelers.

By providing a building where culture and arts can be promoted in the neighbourhood, the artifacts that are sold by the local communities at the roadsides eg at Sultan Hamud, will have a place for sale and display. The centers will also provide vocational entertainment, cultural education for the community, school teams and travelers.

Improved sanitation and water supply

It is no secret that long distance travelers why ply the East African routes in buses, private cars and trucks often identify desolate stretches of the roads to relieve themselves. This is because toilet facilities are few and far in-between their destinations. This practice is not only unhealthy but demeaning especially where many people travel together in a vehicle. In towns where a basic roadside parking without sanitation facilities is provided eg in Taru and Manyani in Kenya, Katovu and Lyantonde in Uganda; there is evidence of unhygienic use of the parking in the night by the truck drivers and other road users marked by faecal matter and foul smell.

It is envisaged that the proposed RSS will alleviate this situation along the Northern Corridor. Water supply and sanitation issues have a strong social dimension. By enhancing access to safe water supply to communities, the RSS will improve household hygiene and health of the population in the area. Therefore there will be a lessened burden of fetching water by women and children who will spend more time in pursuit of economic gains and education respectively. By providing these services the social fabric is enhanced.

Improved health services

The RSS are intended to provide travelers, sex workers and the local community with sustainable access to basic health care and safety right where it is needed. This will alleviate the stigma that sex workers have to overcome when seeking for preventive or treatment of STIs in conventional facilities. It will also bringing services to the truck drivers who would otherwise seek for it far from their places of work.

<u>Expected negative impacts</u>

Displacement of Persons

The proposed RSS are to be located outside the built-up areas in the various towns, preferably on public land. However, it was not practical in all cases to propose the citing on public land because either it was unavailable, or unsuitable for RSS location, or the status could not be ascertained. In most towns land suitable for RSS location was identified and it happened to be on private land. Therefore modalities for property acquisition will have to be initiated. This aquisition of land is expected to result in displacement and resettlement of residents which can lead to further impacts on the community. Residents displaced for the construction of the RSS may experience additional impacts such as:

- Economic impact resulting from acquiring new housing at a new location;
- Social and psychological impacts due to the disruption of social relationships; the movement of residents will disrupt the social relationships in the community, creating a further loss for those who remain. And, the disruption of residents can lead to a loss of satisfaction with life in the community and reduced participation in community activities.
- Establishing relationships in a new social environment.

Displacement of some Businesses and Community Services

The RSS projects target vacant land just outside the CBDs of most towns, or public land earmarked for development of utilities. These are places currently used for open air markets, recreation, public meetings, religous crusades etc. Therefore the proposed RSS will impact on businesses and community services (e.g., churches, community centres, and parks) which will experience a significant impact when they are removed or relocated. The businesses and community services may have difficulty in obtaining suitable relocation sites, they may lose clients, and, upon relocation, may incur additional costs to re-establish. These can be grounds for some communities objecting to the establishment of RSS.

Local conflict of interests

According to the surveys, the proposed RSS project enjoys widespread popular support from the communities. However three respondents lamented that local conflict of interests may arise from local investors in hotel, lodging, fuel station and retail services who see this as a competing initiative in an already crowded market. They lament that with massive capital investment from the Government; their own businesses will lose clients to the “Government” initiative. This group of persons is not very receptive to the project.

Disruptions in community’s structure

The operating of the RSS and the is likely to bring in their wake alien lifestyle, new community relations will certainly emerge in the new RSS and around the sub-projects sites.

The immigrant populations coming and settling into the area, are likely to introduce alien cultural practices, norms and values. This of course is likely to result in the dilution of the local culture and disruption of the existing traditional life cycles. Some of the immigrants will establish new settlements and economic opportunities.

Basically, new economic opportunities and the effects of economic changes at the household-level will affect the social structure in different ways.

- Youth

For the young people the project could mean the possibility of job opportunities, the call-effect that the project may induce into this categories of the population may lead to some disruption of the socioeconomic structures of the local communities.

In local communities, where pastoralism is the main activity, these young people are those in charge of the cattle, so the abandonment of this activity by the young can bring a drastic change in the household and local economy.

And then there are the environmental values such as nutrient recycling, maintenance of pasture productivity and biodiversity, tree regeneration, maintenance of natural ponds and carbon sequestration for both climate change mitigation and adaptation.

- Women

Despite women are making a large - although frequently unseen - contribution to the economy, particularly in the agricultural and informal business sectors , those living in the communities generally suffer from a broad range of human rights abuses, including, lack of education and domestic violence.

Even when the new RSS project could mean an opportunity for their promotion, the increase in the number of truckers and passengers related to the improvement of the mobility conditions in the area are likely to bring unacceptable alien cultural practices, norms and values. This of course is likely to result in the dilution of the local culture and disruption of the existing traditional life cycles.

This new scenario linked to poor overall economic situation of women in the neighbor communities and their situation of dependence can be an ideal breeding ground to attract local young women to prostitution. These RSS can also act as an attraction factor for some other young women from remote communities, becoming migrant sex workers.

Migrant sex workers in particular are further marginalized by factors such as immigration status, lack of fluency in the local language, and cultural barriers that inhibit their ability to negotiate for safe sex and health seeking behaviours

Sexual violence, low levels of education, stigmatization, age of entrance into the profession, low health seeking behaviour, as well as general lack of health access also contribute to the risk environment.

- Children

The expected opportunities that the new RSS may bring may encourage a potential migratory effect with the aim of supporting their families. However, while they may be able to send remittances, these alone do not solve the other serious social problems those left behind face. In particular, social care systems often do not have the capacity to assist those affected by the migration of a family member – particularly a spouse.

Therefore, when the mother leaves, some others are often forced to take on unfamiliar new responsibilities in an environment that does not prepare them or

accept them in this role. If both the parents of a child leave, the child may be left in the care of elderly grandparents, other families, or left to fend for themselves.

Therefore, migration may cause social vulnerability for the family members they leave behind. The results can be drastic, leading to discrimination and disempowerment, affecting children's schooling, and in some cases even facilitating trafficking in human beings. Special measures and attention is therefore required to ensure that the migration of a family member does not lead to those left behind suffering.

Sex work drug abuse and insecurity

Sex workers, truckers, and other key populations are associated with transport corridors. Clientele of sex workers along the transport corridors vary according to location, but almost always include truckers; truck drivers as well as turn boys. Risk factors such as overnight stays, the isolation associated with travelling away from a familiar source of life for truckers, and disposable income create a disparity between the truckers and the community

Due to these challenges truckers tend to seek entertainment during stop-overs usually involving alcohol and multiple concurrent partnerships and the trading of sex with sex workers. Many sex workers in fact rely on truckers as consistent clients, because of their access to disposable income and regularity along the corridors.

These sex workers along the transport corridors engage in sex primarily through bars and lodging based trade. Poverty and lack of opportunity are the main determining factors for them.

The new RSS may play a role as attraction points for these types of activities attracting prostitutes from remote places and, on the other hand, favoring prostitution between the women of the neighbor communities where these RSS are located.

Clear strategies should be established and applied to avoid these conflicts, including information campaigns and programs to encourage the promotion of young women as preference target groups to benefit from the advantages and new opportunities of the economical investments that the RSS would bring in the areas instead.

Health and safety

The operating of the RSS may be a catalyst to development of every sector in the economy. If that be, as factors responsible of increase in volume of traffic/human movements the operation of the RSS will be also playing a role in health; as it affects the spread and diffusion of diseases

The mobility of people will be supported and encouraged by the improved road infrastructures. These movements and/or trips are undertaken by all kinds of people including the sick; as there are no designed measures, tests or checks to indentify or to deny them entry into the road transport infrastructures.

Consequently, the role of drivers, and other travelers, the side by side or face to face congested seating arrangement, especially in public transport, as well as the sexual interactions between commuters who may have different sickness and commercial sex workers/people in stopping places; also the use of common/public conveniences along the corridor of road and refusal to observe

simple hygiene, provides opportunities for the transmission and spread of diseases like Cholera, Malaria, HIV/AIDS, Tuberculosis, Diarrhea, STD and Flu to mention only some.

- Spread of AIDS

Mobility alone is not a risk factor for HIV it acts to increase vulnerability to HIV transmission given these risk taking behaviors. While mobility and HIV do not have a linear cause-and-effect relationship, mobility may create conditions, which make people more susceptible to HIV exposure. The vulnerability stems from a number of individual, social, and environmental risk factors such as the socio-demographic profile, the separation from spouses, the disruption of socio-cultural norms, the lack of access to health information and services, and the poor social support systems

Paid sex or sex work is an important factor in HIV transmission Research shows that sex workers have a high prevalence of HIV and Sexually Transmitted Infections (STIs). The HIV prevalence among (female) sex workers in the area is almost 30%; the highest in the world(Modes of Transmission 2008, Baral et al 2012, NASCOP, 2012).High levels of transactional sex, multiple, drug and alcohol use, among other factors increase vulnerability to HIV transmission.

Truck drivers are attractive clients of commercial sex workers; however, many other women may have casual or regular sexual relations with them. Truckers have sexual partners among local young girls and among women who provide services along transport corridors, such as female bars attendants and street traders.

High levels of transactional sex, multiple concurrent partnerships, low consistency of condom use, drug and alcohol use, among other factors increase vulnerability to HIV transmission.

Related to the previous, clear and effective strategies should be applied to avoid these new RSS turn into prostitution attraction points.

4.1.3. IMPACT ANALYSIS

To resume the expected environmental an social impacts for the operating of the RSS, the following table summarizes, for some selected RSS, the potential impacts that the operation of these facilities could somehow introduce into the natural environment, as additional problems of pollution or presence of more residues and wastes, or , on the other hand, the presence of the RSS will instead overcome the problems that in this regard the selected places are currently suffering.

It also details the presence or absence of environmental constraints for their implementation and operation, as the presence of environmentally valuable areas, wildlife corridors, streams or protected natural areas. In this case a negative impact may take place that would compromise the functioning of the RSS unless adequate corrective measures are designed and executed (when possible).

As for the possible social constraints the table reflects the possibility that the RSS may induce the creation of a negative impact, such as interfering with the local economy, hinder normal community socioeconomic relations or interfere with the development of some ongoing project in that area.

Another entry in the table also includes the possibility that the project may be rejected by the community, since in some cases the RSS can be appreciated as an aggravating circumstance of the current situation, such as insecurity, increased immigration or prostitution, so in these cases the project would require a public consultation campaign which raised the strategies needed to bring residents to the project through the implementation of appropriate compensation measures.

Thus each RSS is caracterized by a simbol that expresses the positive or negative impact regarding the different environmental or social issue identified.

Pollution/Wastes		The RSS may induce new environmental impacts related to water pollution and increase of wastes and disposals
		Establishing the RSS will overcome the present problems of water pollution and lack of disposal treatments
Environmental Constraints		The location of the RSS would be constrained by physical/environmental factors
		The location of the RSS would not face major environmental constrains
Social & Economic issues		The location of the RSS would interfere with the local economy and/or may worsen current social problems
		The establishment of the RSS is considered as an opportunity to widen economic opportunities in the area
Social Acceptance		Establishing a public RSS in this location could meet social resistance. Needs for community work and social corrective/compensation measures
		No major socio cultural shocks are anticipated. The RSS will be highly welcomed by the local communities

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
KENYA						
NAME OF STATION	Miritini					Currently trucks park along the highway or in the neighbouring Miritini station if space allows. The proposed RSS will be able to solve traffic snarl ups that are common in the proposed site, reduce incidences of other traffic driving on road shoulders, the risk to pedestrians using the road and the challenge of solid and sewage disposal problems. However the RSS project will raise resettlement and compensation issues and it will displace poor vendors who sell along the highway.
	Taru					The proposed RSS will widen economic opportunities by truckers buying food and personal provisions, lodge in their hotels, and employ watchmen to guard trucks. It will also improve solid waste disposal facilities and improve town planning. However, they decry prostitution that is enhanced by the parking facilities
	Mackinnon Road II					The proposed RSS will be used to disseminate the rich history of the town and to relive a history of travellers that started in the pre-colonial times. It will also improve the economic and social life of the residents. However, the RSS will be constrained by the active wildlife corridor which makes the 30 Km stretch between Mackinnon road and Maungu unsuitable for RSS stations. This stretch also has

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
KENYA						
						the diversion to Bachuma gate of Tsavo Park, and has several spring areas along the road that are important sources of water for domestic and wild animals. The RSS will solve the problem of these spring areas being misused as sites for cleaning trucks.
	Maungu					The proposed RSS is welcomed in this time to help shed off the social stigma that associates the residents of this town and the truckers. It will complement the initiatives by the NGOs to provide alternative income to youth who would be lured into illicit practice. The new RSS could complement the towns piped water, waste disposal and surface drainage during the wet season.
	Manyani					No major socio-cultural shocks are anticipated in the introduction of the new RSS. The new park should be in close proximity to the market centre to avoid conflict with wildlife, as this centre is actually within an active North-South wildlife corridor. In addition, there are spring areas close to the road as you leave the town towards Nairobi which locals have started using for lorry wash facilities. These areas have to be left for wildlife use only.

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
KENYA						
	Mtito Andei					The location and design of the park will be constrained by physical/environmental factors that include the town itself, National Parks to the South East of the Town, the Kenya Pipeline and Kenya Railways reserve and the existing A109 highway. However, it is proposed that the RSS in this area should be designed to cater for the large number of tourists that pass through the area as well as other travellers.
	Makindu					The proposed RSS will widen economic opportunities for trade thereby curbing the migration of youth to other towns and cities to look for employment opportunities, provide residents with opportunities to eke a living as traders and help improve the town's water supply that is fairly erratic.
	Sultan Hamud					The proposed RSS will solve the problem of roadside parking which poses danger to other traffic especially at night when visibility is poor; the issue of trucks taking up space reserved for parking of other vehicles, uncontrolled hawking, and the challenges of disposing of solid waste resulting from agricultural produce and other urban waste.

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
KENYA						
	Junction to Machakos	🟢	🟢	🟢	🟢	This junction town is a favourite stop for the truckers who prefer to stop here to avoid peak hour traffic jams in the city of Nairobi. The RSS will overcome the environmental problems caused for the actual bad drainages, street lighting and solid waste disposal.
	Naivasha	🟢	🟢	🟢	🟢	RSS will provide the town with a convenient parking for trucks which will solve the actual problem with the buses travelling to and from Nairobi/Mombasa that get into Naivasha town and drop off or pick passengers from no designated point here what is not safe especially at night.
	Nakuru	🟢	🔴	🔴	🟢	The proposed RSS should be located on the A104 at the start of the dual carriage way as you enter the town from Nairobi not far from the KPC depot. However, it should avoid the high population area, the railway reserve, the wetland and the road reserve.
	Mau Summit	🟢	🟢	🔴	🔴	The new RSS will overcome the drainage challenges, lack of waste disposal facilities and encroachment by hawkers. There is an outcry over AIDS/STI, prostitution, family break ups and other social vices which the locals attribute to the truckers. Mau Summit is the proposed location of the construction of grade separated interchanges between the A104 and the

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
KENYA						
						B1 roads, to be funded by the International Development Association (IDA).
	Burnt Forest					The residents welcome the trucker's presence because they boost the local economy. The new facility could enhance social cohesion to this fragile community that is still recovering from the post electoral violence of 2008.The new facility (RSS) could enhance the unhealthy situation derived from the lack of sanitation.
	Jua Kali					The RSS will improve the current drainage problems in wet weather creating pollutions problems. There is an outcry over AIDS/STI, prostitution, family break ups and other social vices which the locals attribute to the truckers. Hence there is need to provide healthcare facility to take care of this need.

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
UGANDA						
NAME OF STATION	Malaba	●	●	●	●	No major environmental issues can be pointed that may constraint RSS implementation, however the RSS center should improve the current unhealthy current situation derived from the lack of toilets facilities and sanitation on the Kenyan side. From the socioeconomic point of view the new RSS at the border may help to solve some of the problems pointed by the users (truckers) like the presence of cartels, slow cross-border clearance, frictions between the agents etc. The RSS will mean a clear positive impact favourising the speed of the transactions and therefore the transport economic sector and related activities. The RSS project is very much welcomed by the stakeholders.
	Busia junction	●	●	●	●	The RSS centre should improve the parking facility and provide toilet, bathroom and proper perimeter fencing that will deter attacks from wild animals like monkeys and baboons.
	Naluwerere	●	●	●	●	No environmental or social issues are expected. The community welcome the RSS Naluwerere has a separate plot of land measuring about 10 acres just behind the shops to the south that was designated to be a lorry park.
	Lugazi	●	●	●	●	Current lorry park shows bad sanitary conditions. It is recommended that the open food kiosks should have

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
UGANDA						
						improved infrastructure that should include running water and waste disposal (grey water, black water and solid waste) This will improve hygiene in the parking facility.
	Buwama	●	●	●	●	No environmental and/or social constraints to the implementation of the RSS. The centre will overcome the lack of sanitation of the actual roadside parking.
	Masaka road	●	●	●	●	No environmental and/or social constraints to the implementation of the RSS. The centre will overcome the lack of sanitation of the actual roadside parking. The RSS will be welcomed since the place is faced with competition for space, and this poses challenges to urban transport in general and truckers in particular.
	Kyazanga	●	●	●	●	No environmental and/or social constraints to the implementation of the RSS. The centre should will overcome the lack of sanitation of the actual roadside parking-
	Biharwe	●	●	●	●	No environmental and/or social constraints to the implementation of the RSS. The centre will overcome the lack of sanitation of the actual roadside parking.

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
UGANDA						
	Ntungamo					No environmental and/or social constraints to the implementation of the RSS. The community is very sensible at works since the rehabilitation of the road, and wants speed bumps erected in the town. The RSS will overcome the lack of sanitary conditions of the actual truck park.
	Kabale					No environmental and/or social constraints to the implementation of the RSS. The residents see the RSS as a market opportunity. However the resident may apply for the rehabilitation of the roads from the town streets as a condition.

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
RWANDA						
NAME OF STATION	Rukomo					This town is well suited for a RSS because it is in the middle of a steep descent through a hilly terrain. The residents welcome the opportunities that will be presented by the RSS.
	Ruhango					The proposed RSS will complement efforts by the local administration to make Ruhango a tourist destination, reduce the number of idling youths that is rising in town and encourage travellers to buy products from the new modern market in town. However, the RSS will be limited by settlements that are built close to the roads.
	Butare					A RSS is important to this city that needs to expand parking facilities to cater for the high number of travellers through the town. By locating the RSS in the outskirts of town, it will help improve sanitation, water supply and surface drainage. Here it will raise minimal resettlement and compensation issues.

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Comments
BURUNDI						
NAME OF STATION	Bugarama					A RSS is important to this city that needs to expand parking facilities to cater for the high number of travellers to and from Uvira (DRC), Tanzania and Rwanda by locating the RSS in the outskirts of Bujumbura. It will help improve sanitation, water supply and surface drainage. Here it will raise minimal resettlement and compensation issues.

The corrective measures in the stations with any negative impact are:

PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Corrective Measures
KENYA						
	Miritini					Resettlement Action Plan Public Consultation Process
	Mackinnon Road II					Clear delimitation of wildlife corridor Environmental Impact Assessment Study
	Manyani					Clear delimitation of wildlife corridor Environmental Impact Assessment Study
	Mtito Andei					Identification of Stakeholders and Public Consultation process Environmental Impact Assessment Study
	Nakuru					Identification of Stakeholders and Public Consultation process Environmental Impact Assessment Study
	Mau Sumit					Identification of Stakeholders and Public Consultation Process
	Jua Kali					Identification of Stakeholders and Public Consultation Process
PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Corrective Measures
UGANDA						
	Ntungamo					Identification of Stakeholders and Public Consultation Process
	Kabale					Identification of Stakeholders and Public Consultation Process
PROPOSED RSS		Pollution/Wastes	Environmental Constraints	Social & Economic issues	Social Acceptance	Corrective Measures
RWANDA						
	Ruhango					Resettlement Action Plan Public Consultation Process
	Butare					Resettlement Action Plan Public Consultation Process
BURUNDI						
	Bugarama					Resettlement Action Plan Public Consultation Process

Environmental and Social issues and activities depends on the different services provide by the RSSs. A summary of the different services and the impacts related to them, listed above, are presented below.

Services	Environment											Socio-economic:				
	Air quality	Noise pollution	Waste water management	Solid waste generation	Waste oil management	Fuel storage and refilling	Leakage of fuel tanks	Water save	Electricity usage	Landscaping	Soil contamination	Traffic density	Socio-economic activities	Security	Environment Health and Safety	Tourist promotion
Petrol station	x	x	x	x	x	x	x	x	x	x	x	x	x		x	
Parking area	x	x	x	x	x					x	x	x	x	x		
Services to trucks (repair)	x	x	x	x	x			x	x		x		x		x	
Cleaning of trucks and cars	x	x	x	x	x			x	x		x		x		x	
Motor vehicle workshop	x	x	x	x	x			x	x		x		x		x	
Toilets			x	x				x	x		x				x	
Bar			x	x				x	x		x		x		x	x
Restaurant facilities			x	x	x			x	x		x		x		x	x
Hotel		x	x	x	x			x	x		x		x		x	x
Shops			x	x				x		x			x	x		x
Supermarket			x	x				x					x	x		x
Pedestrian and green areas								x					x	x		x
Bank			x	x				x	x				x	x		
Health clinic			x	x				x	x			x	x		x	
Security services			x	x				x	x				x			
Bureau office			x	x				x	x				x			
Recreational area (lounge for the community)			x	x				x	x				x			
Tourist Information point			x	x				x	x				x			
Administrative offices			x	x				x	x				x			
Weighbridge			x	x				x	x				x			
Police check point			x	x				x	x				x			

For each impacts and factors identified a set of mitigation measures and management guideline is presented in detail hereinafter.

4.1.4. RECOMENDATIONS FOR ENVIRONMENTAL MANAGEMENT OF THE RSSs

Objective

The general objective is to assure an environmental friendly management of RSS. The specific objective is to recommend guidelines for environmental management of the proposed RSSs.

The environmental management recommendations want to show how environmental impacts can be addressed through the inclusion of specific mitigate measures, actions and rules during the RSS´s operation.

As a milestone, RSS´s operation has to be in full compliance with national environmental regulations and site specific conditions of authorization. More over RSS´s operation has to set of self-imposed responsible standards where laws and regulations do not exist.

Introduction

Services and facilities provided by RSS can be grouped in relation with its likely impact on the environment as follows:

- Petrol stations and motor vehicle workshops
- Bars, restaurant and hotels, including toilets
- Shops and markets
- Offices

Targets elements to take into consideration for highway rest areas and roadside facilities are:

a) Negative impacts on physical/biological environment

- Pollution control of surface/underground water and soils
- Indirect pollution control of cultivated areas and therefore crops
- Proper waste management (generation, handling, storage and disposal)
- Noise and air pollution control

Recommendations for the management and mitigation of environmental impacts and activities

Main environmental and social impacts to manage for RSSs can be divided as follows:

Environment:

- Air quality
- Noise pollution
- Waste water management
- Solid waste generation
- Waste oil management
- Fuel storage and refilling
- Leakage of fuel tanks
- Water save
- Electricity usage
- Landscaping

- Soil contamination

Air quality

Environmental / Social issue / Aspect / Activity	Management and mitigation
Air quality	▪ Ensure that the generators are maintained to manufacturer's specifications, maintained records and are availed whenever there is need. ▪ Ensure that tank vents are located away from sensitive receptors. ▪ Conduct control operation activities at the sites that could influence air quality; include exhaust emissions from idling vehicles, refrigerated vehicles and general patronage of the rest area.

Noise pollution

Environmental / Social issue / Aspect / Activity	Management and mitigation
Noise pollution	▪ Manage the RSS´s parking and services to ensure that noise to neighbour residents is kept within reasonable levels. ▪ Landscaping and planting of trees will reduce noise levels to a high extent.

Waste water management

Surface water: Surface run-off from open surfaces should not mix with the waste water. In this regard, storm water drains should be provided to pass at safe distances from the wastewater sources and drains. Sources of pollutant of petrol stations are shown in next figure.

Possible discharges in runoff to surface watercourses.	
Leaks from:	— under dispenser valves and flexible couplings — pipework — tanks and offset fill pipes — faulty oil/water separator operation
Possible discharges to soakaways.	
Spills during:	— customer refuelling, including leaking car fuel tanks — filling of petrol filling station underground storage tanks directly or by below ground level offset fill points — filling of petrol filling station underground storage tanks via above ground level offset fill points — overfilling of portable containers

Sources of discharges during normal site petrol stations operation

To prevent such impacts petrol stations and motor vehicle workshops must have perimeter concrete closed ditches to divert water runoff polluted by oils, fuels and other toxic substances to avoid contamination to the neighbourhood lands.

A perimeter open drains will be also considerate to the parking area or other areas that can become contaminated by oil or to avoid polluted water runoff by oils and fuels from the trucks and cars during rainy days. This waste carries silt, sediment oil and grease.

Water runoff control must also be considerate for the vehicle washing service to avoid the entering of polluted water into the surrounding soils.

Waste water resulting from the use of toilets, bar, hotel and restaurant should be directed into septic tanks.

Environmental / Social issue / Aspect / Activity	Management and mitigation
Waste water management practices	▪ Adhere to waste water management regulations and water quality regulations ▪ Construct perimeter closed ditches around the petrol stations and workshops ▪ Consider the construction of open ditches around the whole RSS or at least at the parking area ▪ Install adequate septic tanks ▪ Waste water should empty to the septic tank via well laid sewage pipes. Avoid effluents on open drains ▪ Regular monitoring of the septic tanks ▪ Maintain septic tanks and fields in accordance with manufacturer's maintenance specifications

Environmental / Social issue / Aspect / Activity	Management and mitigation
	▪ Conduct inspections for sewer pipe blockages or damages and fix them ▪ Empty septic tank whenever its full by a licensed exhauster services

Solid waste generation

The design should therefore provide for suitable solid waste collection receptacles at strategic locations at the premises. An accessible area with a concrete slab should also be provided for collection and storage of the various solid waste categories awaiting disposal. Use secure garbage containers designed to be "bear-proof" or inaccessible to wildlife. The solid waste should be collected daily.

Environmental / Social issue / Aspect / Activity	Management and mitigation
Solid waste generation and disposal (Littering, soil and surface water pollution)	▪ Comply with the requirements of national waste management regulations ▪ Segregate waste at source ▪ Minimize solid waste generated on site ▪ Construction of a central waste collection point with bulk storage facilities ▪ The site should have well maintained waste receptacles with bulk storage facilities at convenient points to prevent littering ▪ The solid waste will be collected daily ▪ Identify Licensed waste disposal contractor to remove from site and monitor performance ▪ Recycle waste especially office paper ▪ Monitor waste volumes

Waste oil management

Environmental / Social issue / Aspect / Activity	Management and mitigation
Waste oil management practices	▪ Carefully collect used oil in drums and dispose of by licensed refuse contractor ▪ All oil products should be stored in a site store and handled carefully ▪ Regular collection and disposal of waste oils from workshops and petrol stations ▪ Machinery should be well maintained to prevent oil leaks

Fuel storage and refueling and leakage of fuel tanks

Surface spills and leaks are likely to happen during fuelling and tank filling activities thus increasing risks of fire and ground contamination. The station drainage plan should ensure that all spillage arising from the forecourt operations are well managed.

Environmental / Social issue / Aspect / Activity	Management and mitigation
Fuel / Oil spills	▪ Use properly maintained hoses and fittings ▪ Ensuring no spills during refilling
Leakage of fuel tanks	▪ Insurance against the consequences of a spill contaminating groundwater or soil ▪ In case of suspect losses, institute tank and line integrity testing; and conduct a soil gas survey to check the extent of contamination from the leaks

Water save

The implementation of roof water harvesting system is highly recommended.

Environmental / Social issue / Aspect / Activity	Management and mitigation
Water save	▪ Promptly detect leaking taps and repair them ▪ Install water conserving taps or automatic water taps ▪ Install a discharge water meter in the premises to check on total water use ▪ Periodical cleaning of rain water harvesting system to avoid clogging ▪ Regular maintenance of tank

Washrooms

Environmental / Social issue / Aspect / Activity	Management and mitigation
Washrooms	▪ Provide sufficient and suitable sanitary conveniences ▪ Separate washrooms (gents & ladies) ▪ The washrooms should be kept clean and in good working conditions ▪ Provide a water tank for the washrooms in case the piped water supply is not available

Electricity usage

Environmental / Social issue / Aspect / Activity	Management and mitigation
Electricity usage	▪ Use of energy conserving bulbs/ tubes ▪ Use of natural light for lighting purposes ▪ Provide a standby generator in the premises in case power goes out ▪ Erect a meter in the premises to check on total kilowatts used

Landscaping

Environmental / Social issue / Aspect / Activity	Management and mitigation
Landscaping	▪ During RSS enlargement retain as much existing vegetation on the site as possible ▪ The plants selected should be pollutant tolerant, able to absorb pollutants, dust resistant, noise reducing and beautifying so as to create an unspoiled green land area ▪ Types of plants that can survive easily should be chosen ▪ Regular watering of trees, pruning and removal of dried trees and leaf drops

Soil contamination

Environmental / Social issue / Aspect / Activity	Management and mitigation
Soil contamination	▪ If soils contamination is found to pose unacceptable risk to either the environment or human health receptors a remedial action plan has to be developed and remediation works have to be undertaken.

Traffic density

Environmental / Social issue / Aspect / Activity	Management and mitigation
Traffic density	▪ Proper signage put in place to notify neighbours of the activity and presence of heavy vehicles and to direct traffic. Presence of boards directing patrons to the site. Strict adherence to traffic rules. ▪ Clear well maintained sign boards along the roads.

For particular events that can heavily impact on the environment emergency plans can be developed. The most important ones are:

- Fire and accident
- Fuel spills
- First Aid

Emergency plans

Fire and accident	▪ Provision and placement of appropriate fire extinguishers and training of personnel to handle emergency situations ▪ Display warning signs at suitable locations ▪ Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence ▪ Fire fighting drills carried out regularly ▪ Ensure all fire fighting equipment is regularly maintained, serviced and inspected ▪ Weatherproof fittings for all lighting and power points located outside the fuel station
Fuel spills	▪ Document and train staff in the emergency spill

	response plan
First Aid	▪ A well stocked first aid kit shall be maintained by a qualified personnel

4.1.5. RECOMENDATIONS FOR SOCIAL MANAGEMENT OF THE RSSs

Objective

The general objective is to assure the introduction of social issues within RSS management. The specific objective is to recommend guidelines for social management of the proposed RSSs.

The social management recommendations want to show how environmental and social issues can be addressed through the inclusion of specific mitigate measures, actions and rules during the RSS´s operation.

Recommendations for the management and mitigation of environmental impacts and activities

Main environmental social issues to manage for RSSs can be divided as follows:

Positives social aspects to enforce:

- Increase of local incomes (trading, markets, employ, ..)
- Health care
- Increase of local products sales
- Increase of security
- Community involvement and participation

Negative social aspects to fight:

- Lack of security
- Illegal trade, illegal marketing
- Disruption of social life cycles
- Prostitution
- HIV/STD and other diseases
- Gender discrimination

Creation of an Environmental and Social Unit during project implementation

During works, the engineer will empower an Environmental and Social Unit (ESU) which will be in charge of the implementation of the Environmental Monitoring Plan during works, directed by an environmental expert specialist in local flora and vegetation with proven experience in environmental management in the different countries.

This ESU will be composed by a number of experts in various environmental and social issues. The ESU Director will be charged with the responsibility of steering the implementation of the Environmental Monitoring Plan and will coordinate all the tasks assigned to the team.

The environmental unit must ensure that mitigation measures and monitoring concerns raised by the personnel involved in the project are addressed in a timely manner.

Community Involvement and Participation

Local community and Stakeholders. Public Meetings and Audits

Hold Public Consultation with local community is of great importance for all Project´s phases: design and operation.

During the design phase public consultation and informative meetings should be scheduled and carried out with the aim to integrate the demands and expectations of the local community and main stakeholders. Thus, an information campaign will be organized in advance and in any event before the actual start of project work in order to meet the accession of the residents affected by the works.

The social acceptance of the project will be then ensured by through a series of district level stakeholders forums, and subsequently solidified through the grassroots level community meetings before the implementation of the RSSs.

The objective of the Public Consultation campaign will be

- To provide a forum to introduce and to sensitize the key participants at the district level, on the proposed project interventions in the district.
- To provide a participatory session for the local stakeholders and representatives of the intended beneficiaries, to consult, discuss, understand and appreciate the benefits and other impacts that are likely to ensue from the proposed development project, notwithstanding that the broadly social acceptance will be secured through intensive dialoguing and consensus building between all the parties involved.

Special attention will be given to those RSSs where some previous social constraints have been identified and or some other ongoing projects in the area may interfere with the RSS design and development.

In these particular cases, it is important to identify the main stakeholders, economic and political agents involved throughout the public consultation campaign

During operation the operator of the RSS will work to maintain a continuous informative relationship with the community, through its representatives.

Important topics are:

- Employment for locals, especially for the youth.
- Number of shops within the RSS and type of products for sale in the shops
- Tourist information desk; cultural traditions and natural values.
- Opportunities for local food supply to the hotels and restaurants.
- Ways to address traffic problems and possible accidents.
- Fight against theft, prostitution, and illegal trade.

<u>Methodology</u>

Before the starting of the works, the contactor will organize public participation and consultation meetings with the inhabitants of the area at local level, that is, people directly affected by the project actions as well as the agents and local authorities.

The purpose will be to transmit the information about the programmed action and the aims of the project and to collect all the complaints, inquires, demands, questions, etc. Another additional objective is to inform them about the environmental and social measures that will be carried out by the project and achieve their implication.

Such public participation campaigns shall be held at 2 levels:

- Stakeholders consultations at the district level
- Community consultations at the sites to be affected by the Project's infrastructural installations.

These will be (a) Before the start of works (b) Every 6 months during the first and second years of implementation (c) Final (Evaluative) meetings after 1 year.

The list of attendees to the meeting will be performed by the social and environmental unit tem leader and the social expert

The meetings will be held in appropriate places provided by the contractor. The places should count with all the facilities that may be required for the meetings to be held in properly conditions, like electricity, water, toilets etc. The contractor will be responsible for paying the cost of transport and / or allowances stipulated to persons attending the meeting, and paying for soft drinks or water and food.

The public participatory meetings will be borne by the Director and the Social Expert of the Environmental and Social Unit and/or some other specialized agent, and will be conducted prior to the start-goal of the work so quickly identify the owners of the land (or illegal or allowed inhabitants) and let them know that they could be expropriated for reasons of public utility. Some land will only be temporarily requisitioned and leased during the execution of works. It is recommended as an effective management of labours that audits must be done before the opening of the work sites.

Environmental / Social issue / Aspect / Activity	Management and mitigation
Community involvement. Project social acceptance	▪ Conduct public consultation meetings at different levels before, during, and after project implementation

Training courses for workers

Drawing of majority of workforce from local communities will avoid problems that can occur if workers are imported, including social conflicts and issues of health and sanitation due to the labour camps.

Local youth generally shows an unskilled profile, thus higher impact on local youth employment will come from a higher unskilled labor demand, although they can become skilled laborers during their large experience over the construction period.

Twice a year during works, the contractors will be obliged to conduct training courses in construction, forestry, masonry and operation of machinery.

These courses will be designed essentially for unskilled local workers. The courses will be given by the technicians and workers of the contractor of the works to a minimum of 30 persons from among the contracted workers.

The duration of the courses will be at least of 10 days (80 hours).

The list of assistants to the courses and workshops will be performed by the contractor under the supervision of the Social Expert and the ESU Director. The contents and final scope of the training campaign will be set out by the contractor under the supervision of the Social Expert and the ESU Director.

The courses will be held in an appropriate place at worksites provided by the contractor. The place shall count with all the facilities that may be required for the courses and workshops being taught properly.

Environmental / Social issue / Aspect / Activity	Management and mitigation
Community involvement. Promotion of employment for local communities	▪ Conduct periodic training courses in construction, forestry, masonry and operation of machinery

Tourism promotion

Another opportunity to involve the community in the economic development is the tourist promotion of those areas with natural values, providing tourist information to the visitors. The ultimate objective will be to create opportunities for a range of tourism developments in the region, thereby encouraging economic development, job creation and assisting in the alleviation of poverty in those areas.

Those RSS located in potentially tourist attractive areas (eg Nakuru) Should hold a tourist promotion centre depending on a particular community, with general provision for art galleries, open-air fields for cultural activities, The centres will first be aimed at promoting culture but they will be centres of interest, attracting thousands of tourists each year, thus going a long way in promoting cultural tourism.

In cultural activities the community or a people show case their culture – in terms of cultural dances, storytelling, making and selling artefacts and generally showcasing their history, way of life and pride.

Handicrafts are some of the simplest hands-on businesses that can be established simply because this is an activity already in place and involves women and youth in the value chain. A business and tourism attraction could be developed at the same time.

Environmental / Social issue / Aspect / Activity	Management and mitigation
Community involvement. Tourism promotion	▪ The rest area would also present an opportunity to provide tourist information for visitors. Improve Tourist Information to visitors ▪ Increase local business promotional activities ▪ Strategies for the development and promotion of tourism

Health and safety

AIDS prevention

During works and due to the huge amount of workers that may turn up in the areas of works, regarding the dimensions of this project it is essential to prevent the spread of sexually transmitted diseases, twice a year during works. The contractors will be obliged to conduct a one week duration HIV/aids awareness campaign among their staff in the workplace and in the labour camps. Contractors – in collaboration with the Ministries of

Public Health and other agencies, will equally be obliged to extend the workplace HIV/aids prevention campaign to the neighbouring communities.

These courses will be directed by the social expert. The contents and final scope of the campaign will be set out by the ESU Director after health authority's consultations.

At the end of each campaign a report including the contents of the campaign and a list of attendees, workers, businesses and agencies, etc. will be issued. This report will be signed by all the attendees and the responsible of the prevention campaign.

Also, as addressed in previous points, the operation of the new RSS and the increase in the mobility within the area expected due to the improvement of the facilities may result in an increase of HIV infection due to migration of sex workers. Also Female workers bar attendants in RSS and neighbour communities are also likely to offer sexual favours to clients to obtain a minimum income for survival

The operators, through the Ministries of Public Health, will established and maintain an information AIDS prevention board. Intensive campaigns must be held within the RSS and neighbours' locations.

Banners and brochures should be distributed among the participants, written in local languages in addition to English. Information stickers about preventive measures against HIV infection in transportation will be issued and distributed among the workers and drivers.

Environmental / Social issue / Aspect / Activity	Management and mitigation
Health promotion	▪ Conduct periodic AIDS prevention courses in RSS and Camps ▪ Provide HIV units health facilities at RSS. They should provide integrated STI/HIV/AIDS/TB services for drivers and workers ▪ Exhaustive control of prostitution between female workers in RSS. Women interventions programmes aimed at raising HIV and AIDS awareness among women and young girls, as well as to improve STI education, condom use, and access to VCT

It is also important to remark that due to the huge dimension of the problem in the transport sector, this issue has been particularly assessed by various studies at national and international level. There are other health and HIV interventions along the corridor.

More specifically UNAIDS and IOM conducted and assessment in 2006 called "*Long-distance Truck Drivers' Perceptions and Behaviors Towards STI/HIV/TB and Existing Health Services in Selected Truck Stops of the Great Lakes Region: a Situation Assessment*". It aims to provide an overview of the main findings on truckers' perceptions and behaviours with a focus on STI/HIV/AIDS related awareness, condom use, sexual network, health-seeking behaviour, as well as drivers' living and working conditions.

Also there are other experiences at national level, like the IOM strategic plan on HIV /AIDS and STI programming along the transport corridor in Kenya, the "*National Strategy on HIV/STI Programming along Transport Corridors in Kenya"* which aims to

achieve corridor-wide scale up of cohesive combination prevention programming that responds to the immediate epidemiological and behavioral drivers of new infections and ensures the provision of HIV services to mobile and key populations along transport in order to achieve HIV free corridors in Kenya and in return, reduce infections among the wider populations.

Other Health and safety issues:

Environmental / Social issue / Aspect / Activity	Management and mitigation
Environment Health and Safety	▪ Train workers on personal safety and disaster preparedness ▪ A well stocked first aid kit shall be maintained by qualified personnel ▪ Conduct annual health and safety audits

Environmental / Social issue / Aspect / Activity	Management and mitigation
Security	▪ Control of secondary businesses. ▪ Round the clock security for the facility. ▪ Adequate lighting and an alarm system installed at strategic points.

Gender Issues

As addressed before the low participation of women in productive employment activities in major sectors can be attributed to factors that curtail women's mobility in economic domain and conflicting role mainly domestic and reproductive responsibilities and constraining nature of occupations where domestic responsibilities cannot be easily combined with economic activity.

Another constraining factor could be limited access to required skills especially during the undertaking of education and training programmes. Unfounded beliefs about women's aptitudes, skills and dispositions, and reproductive responsibilities could also work to hinder women participation in some production sectors.

Therefore women participation has to be enhanced to overcome prejudices and avoid a bad gender impact. Measures to undertake will be:

Promotion of Women

The RSS management have to promote women's participation by encouragement of gender sensitivity in mobilization, recruitment and implementation and by in depth measures like setting quotas in employment. The RSS management should not be gender blind. Even if an important amount of job positions will be created it is expected that for most of the jobs; only few women applications will be received.

Giving the women the opportunity to participate in the economic development throughout well designed and realistic strategies is a key factor related to some other issues. Regulated markets and vending promotion as subproject associated to the RSS can keep women away from prostitution and some other illegal and activities, seen today as their only chance to obtain a minimum income for survival.

As pointed before women participation has to be enhanced with the implementation of a sort of social measures that should be introduced in the RSS projects:

- During public disclosure, the issue of women access to employment throughout construction and operation phases will be treated in depth with the participants.
- A sentence stating that women are encouraged to apply will be added to any job advertising.
- Promote full understanding of available positions between women in order to overcome preconceived ideas about positions that could be fulfilled by them.
- Ensure no gender discrimination during recruitment/employment process
- Interviewers will be sensitized so as to prevent discriminating on the basis of gender (e.g. due to gender bias or stereotypes).
- Women should have preference when letting out space for shops or handicraft sales

Indicators for further monitoring shall be:

- Number of women applications.
- Number of women working on site.
- Employee retention rate (disaggregated by sex)

Self employment promotion

The operating of the RSS can bring some change to the current situation by giving the women new job opportunities (direct employments in RSS) or the chance of starting their own business (regulated vending). As street vendors they are sellers of a myriad of goods selling vegetables, fruits, and other foods; house wares; tools; clothes; toiletries, and a wide variety of self-made goods among the more obvious but they also work as purveyors of services including hair dressing or financial services.

But even for running their own business, women face more severe legal, regulatory, and administrative barriers to starting and running businesses than do their male counterparts. There are social barriers that are preventing women from contributing fully to the local economy and stop women make a full economic contribution, and also improve their livelihoods and those of their families

As pointed before, street vending is a key activity among women in the communities, under an illegal or not regulated shopping area Police handle the regulation and licensing of vendors and the department of transportation monitors the obstruction of traffic flow. In that cases harassment of vendors and the confiscation of their goods can be common.

Compared to male traders, women are more likely to:

- have lower levels of education, prior work experience, and relevant skills;
- be single heads of households and main income earners;
- operate from an open rather than a covered space;
- operate from the street rather than a cart or a stall;
- operate from an insecure or illegal space;
- trade in perishable goods;
- generate a lower volume of trade;
- have greater pressures on their time; and
- have less time: for trade, to learn new skills, for leisure, and for sleep

Thus, the RSS management should assist them in running their businesses and provide supportive services (credit, training, and so forth) and acknowledge their contribution to the economy. The RSS management should:

- Relocate the vendors to RSS, where they could operate legitimately. Costs for vendors to operate within the RSS should not exclude “poor“ vendors because of the cost.
- Women vendors representation at the RSS manager
- The RSS should provide affordable overnight accommodation to women vendors who live too far
- Retain primary responsibility for cleaning the shopping area, and not transfer this responsibility entirely to the vendors trading there.

Day Crèche Facilities

It is expected that among the women vendors and workers there will be mothers with infants and small children.

Provision of a day crèche may solve the problems of such women who can leave behind their children in such crèche and work for the day. The crèche should be provided with at least a trained worker to look after the children. The worker, preferably women, may take care of the children in a better way. In cases of emergency, she, being trained, can tackle the health problems of the children and can organize treatment linking the nearest health centre.

Security

Security is not only a need for trucks, truckers and goods transportation but even for women, sometimes too, are also faced with harassment, particularly sexual harassment at night time when streets are badly lit and when the lack of transport services forces women to go home by foot.

Actions to undertake are the following:

- Safety and security measures for women during the evening hours
- Provide toilet and bathroom facility for woman

Environmental / Social issue / Aspect / Activity	Management and mitigation
Promotion of Women	▪ Promote full understanding of available positions between women. Ensure no gender discrimination during recruitment/employment process ▪ Relocate vendor women to RSS and provide affordable overnight accommodation if needed ▪ Provision of a day crèche ▪ Safety and security measures for women during the evening hours ▪ Provide toilet and bathroom facility for women

4.2. COST-BENEFIT ANALYSIS (CBA)

4.2.1. INTRODUCTION

Scope of works

In this section of the report we will present the economic evaluation of the RSS program along the Northern Corridor (NC)[7]. Cost-Benefit Analysis (CBA) is a method used to calculate the most profitable alternative from a social point of view, by quantifying the costs and benefits of an investment project in monetary terms to allocate society resources in an efficient way. Thus, in this analysis, the social costs (understood as expenses and investments) and benefits of each of the alternatives to be analyzed are compared.

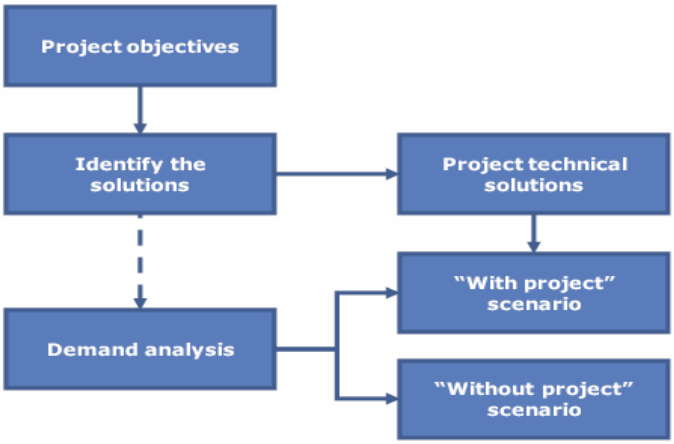
Social benefits are defined as the set of all socially desirable effects that result from the alternative in question, which increase the general welfare of all citizens through the efficient use of public resources and which do not always result in direct revenue streams. The result of this analysis is the net social benefit or social profitability of the project.

We have carried out our analysis by comparing the costs of the implementation of a RSS network along the different branches that compose the NC, with the alternative of non-construction or the *reference scenario* and therefore maintaining the current characteristics of the alignment under study.

As we established in our Inception Report, economic appraisal differs from the financial analysis, in the fact that many of the social and economic benefits and costs are public goods (health, security, time…) or goods without a clear market, and therefore some technical corrections have to be incorporated: conversion factors, shadow prices,..

A CBA needs a preliminary or identification phase, in which we have to estimate the main direct social and economic benefits derived from the RSS program. This estimation requires in a further step the quantification of main project benefits derived from the decrease of social costs when carrying out the project with respect to the reference scenario ("do-nothing" scenario, or scenario of not implementing the RSS program).

Figure: framework of the "with / without" scenario identification



[7] That is the "central" branch Mombasa – Bujumbura, plus other 8 regional branches linked to the main one: a) Tororo – Juba; b) Kampala – Oraba; c) Mbarara – Kisangani; d) Kabale – Goma; e) Butare – Bukavu; f) Mirama Hills link; g) Busia – Yala, and h) Mai Mahiu link

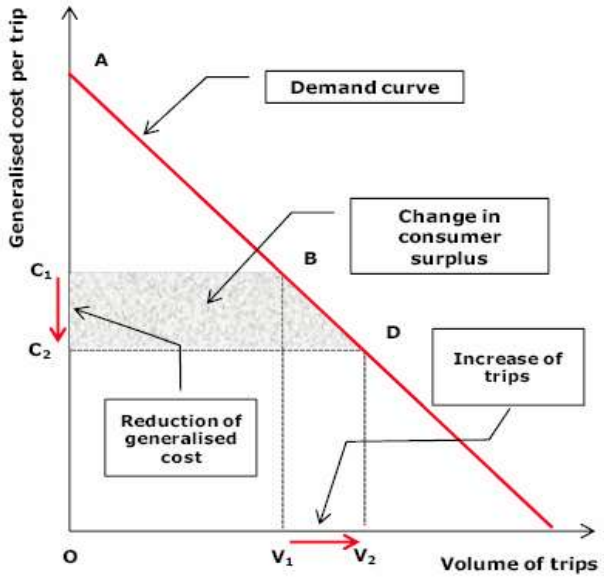
Types of economic benefits derived from project implementation

The aim of this quantification process is to measure the **change in total social surplus** created by the project, which is in turn **the sum of the changes in producer surplus and consumer surplus**. In more practical words, a CBA should address at least the following set of generic economic impacts:

- investments costs
- Operator costs and revenue impacts
- user benefit estimations
- external effects (if any)

In graphical terms, under a standard CBA framework, social benefits result from variations in the area below the transport demand curve, as well as from the variations in economic costs, including external costs (see figure below).

Figure: change in consumer surplus due to increase in average speed



More precisely we will distinguish among the following types of socio economic impacts:

- Economic impacts from investment costs:
  - Design & planning costs
  - Land acquisition, mitigation & compensation payments, legal costs
  - Construction costs: materials, labour, energy, preparation, professional fees..
  - Proposed environmental / social mitigation measures
- Economic impacts from changes in:
- Economic impacts from changes in:
  - Generalized transport costs (GTC) ➔ the basic measure of transport user benefits is the change in consumer surplus resulting from a change in the RSS transport network. This estimation requires:

- The estimation of the volume of travels by mode and trip category for each origin/destination pair ➔ "with" and "without" scenarios needs to be estimated for the base year and forecast for future years.
- The calculation of the potential changes in the *journey times* costs by mode and for each origin/destination pair.
- The combination of the previous information (trip volumes and cost changes) will allow us to calculate the aggregate user benefits summing over all origins and destination[8].

- Infrastructure / system maintenance & operating Costs[9]
  - Changes in the Vehicle Operating Costs (VoC):
  - Standing costs: depreciation, repair and maintenance
- Distance – dependent: overheads, fuel & lubricants
- External effects (safety, health, other externalities[10]) ➔ Accidents and casualties, as well as other externalities, are treated as external costs arising from the transport system, which can be evaluated by applying unit values per accident and per casualty to forecast data on accident and casualty numbers by mode.
- User Charges (if applied)
- Operator Revenues (if applied): changes in the revenues received by operators of transport infrastructure and services can be estimated by applying the appropriate user charges on numbers of trips.

4.2.2. MODEL, ASSUMPTION AND SCENARIOS FOR APPRAISAL

The Model has been carried out in current constant US$ corresponding to 2014[11] prices. They are not inflated, and therefore neither are the different costs nor the investments included in the appraisal.

We have considered a full period for appraisal of 31 years, from year 0 to year 30

Also, as a result of the observations of our field trips we have considered as main types of vehicles in the study the following ones:

- Trucks
- Long distance buses
- Min buses
- Cars

[8] As an example, in the case of the RSS programme, some travel time costs savings to users could arise as a consequence of, by instance, increases in traffic speed (by eliminating unregulated road markets or public agencies controls, etc..)

[9] Operation (signalling,..), maintenance (clearing,..), renewal (resurfacing,..)

[10] Externalities' result when a particular activity produces benefits or costs for other activities that are not directly priced into the market. A firm might keep down its own costs by not investing in water pollution controls, but in so doing would raise the costs of those firms and individuals relying on using clean water. As a result the polluter has imposed an external cost on other users, or alternatively, a reduction in pollution confers an external benefit upon these other users.

[11] 1 Euro = 1.3795 US$ (European Central Bank. Eurosystem. April 2014)

The baseline features for each of the sections and alternatives (in some cases we hade to make estimations from data in the central NC *branch* as not all the information was available in the case of the 8 additional links) are:

- Length, in km on selected road sections
- Average gradient or slope of selected sections
- Average speed of the light vehicles that will travel on each section
- Average speed of the heavy vehicles that will travel on each section
- Average Annual Daily Traffic Intensity (AADT) of light vehicles that will travel on the sections in the first year of operation
- Average Annual Daily Traffic Intensity (AADT) of heavy vehicles that will travel on the section in the first year of operation
- Total investments (civil works, land acquisition, design, construction services and others) necessary to construct each section of the road.

Existing traffic in the Northern Corridor

According to the mission trip undertaken by the consultant team, the documents analyzed and our own data collection in specific road points, we have prepared some practical traffic estimations along the main section of the Northern Corridor: Mombasa – Bujumbura. The key sections distances f the NC considered in the study are showed bellow:

Table: distances of the different links within NC and the "central" NC section

	Km			Km
Mombasa - Bujumbura	1.806,8	*central*	*central NC branche*	
Tororo-Juba	689,6	1	Mombasa - Nairobi	445,7
Kampala-Oraba	562,8	2	Nairobi - Eldoret	283,2
Mbarara-Kisangani	965,6	3	Eldoret - Kampala	307,9
Kabale-Goma	164,0	4	Kampala - Mbarara	252,7
Butare-Bukavu	116,9	5	Mbarara - Kigali	255,8
Mirama Hills link	210,1	6	Kigali - Bujumbura	261,5
Busia-Yala	90,2	7		1807
Maai Mahiu link	56,4	8		

In the table below we present the summary of current traffic patterns, in terms of average annual daily traffic (AADT) in 2013 for each of the route segments considered in the central section of NC:

Table: AADT in the main section of NC by road links and transport modes (2013)

AADT	Cars	Trucks	Minibuses	Buses
Mombasa-Nairobi	1,995	1,187	54	78
Nairobi-Eldoret	1,897	943	75	95
Eldoret-Kampala	1,639	781	70	92
Kampala-Mbarara	1,883	596	150	60
Mbarara-Kigali	1.498	415	149	54

AADT	Cars	Trucks	Minibuses	Buses
Kigali-Bujumbura	396	193	171	10
TOTAL	**9,307**	**4,116**	**669**	**389**

For the purposes of economic modelling and CBA we have projected the traffic data from the start of operations period. Considering that we are assuming 4 years of investments we have really using 2017/18 data for the start of traffic projections

Scenarios for approval

We are defining the following characteristics and specifications for the two scenarios involved in the economic appraisal:

- **"Without" project scenario**, or **reference scenario** (or also, BAU[12] scenario): no RSS network is implemented in the NC. Existing traffic structures, travel times and growth patterns will be the prevailing traffic and travel time projections used under scenario
- **"With" project scenario** (or, simply, **project scenario**): a new network of **67 proposed RSS** (37 in the "central" section and 30 in the different "regional" sections) will be implemented along the NC[13]. Some key elements are defining this scenario

The following is the structure of the different sections within NC and the different proposed density of km between two RSS:

Table: proposed RSS alongside the different NC road sections

		RSS	Km	Densi
Mombasa - Bujumbura		37	1.806,8	48,83
Tororo-Juba	**1**	7	689,6	98,51
Kampala-Oraba	**2**	6	562,8	93,81
Mbarara-Kisangani	**3**	6	965,6	160,93
Kabale-Goma	**4**	2	164,0	81,99
Butare-Bukavu	**5**	2	116,9	58,46
Mirama Hills link	**6**	3	210,1	70,02
Busia-Yala	**7**	3	90,2	30,08
Maai Mahiu link	**8**	1	56,4	56,40

Road design

In terms of road geometry, all the technical characteristics will remain invariable between without / with scenarios, since the RSS program does not affect alignments elements.

The road grades used, by sections, are the following:

- Mombasa – Nairobi (445.7 km.) +0.32%
- Nairobi – Eldoret (283.2 km.) +0.10%

[12] *Business as Usual* (BAU) scenario

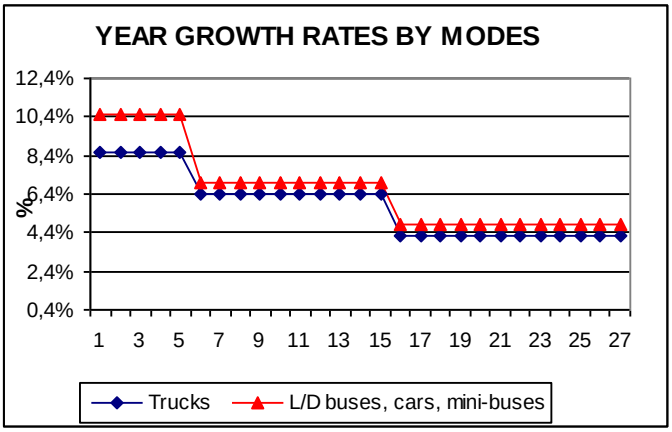
[13] The exact details and data about site locations can be extensively found in the technical section of this report

- Eldoret – Kampala (307.9 km.) -0.30%
- Kampala – Mbarara (252.7 km.) +0.16%
- Mbarara – Kigali (255.8 km.) +0.05%
- Kigali – Bujumbura (261.5 km.) +0.01%

Projected traffic

Traffic structure will be slightly different from BAU scenario: although **normal traffic** growths (differentiated by transport modes) will remain unchanged under a "with" / "without" perspective, we are considering a modest and autonomous component of **generated traffic** growth of 2%.

Figure: Normal traffic by transport modes



AADT. TRAFFIC GROWTH PATTERN

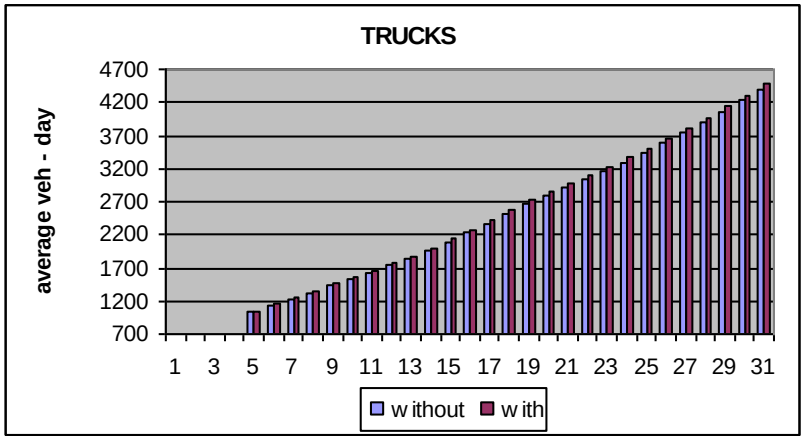
YEARS:	TRUCKS	L.D BUS	MINIBUS	CARS
1 - 5	8,61%	10,51%	10,51%	10,51%
6 - 15	6,41%	7,01%	7,01%	7,01%
15 - 30	4,22%	4,82%	4,82%	4,82%

Gen. Traffic **2,00%** Per year

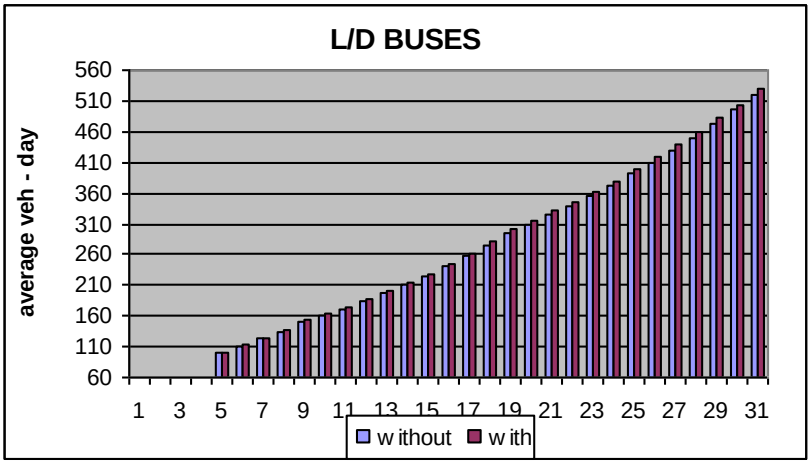
With all the relevant information and estimations at a scenario level, road section levels and transport mode level, we have projected the weighted AADT that will effectively use the Northern Corridor. Again, as a matter of illustration we are showing the results of the "central" section (Mombasa – Bujumbura).

In the below figures we present the final traffic projection series for each scenario (with / without) and for every considered transport mode: trucks, long distance buses, minibuses and cars.

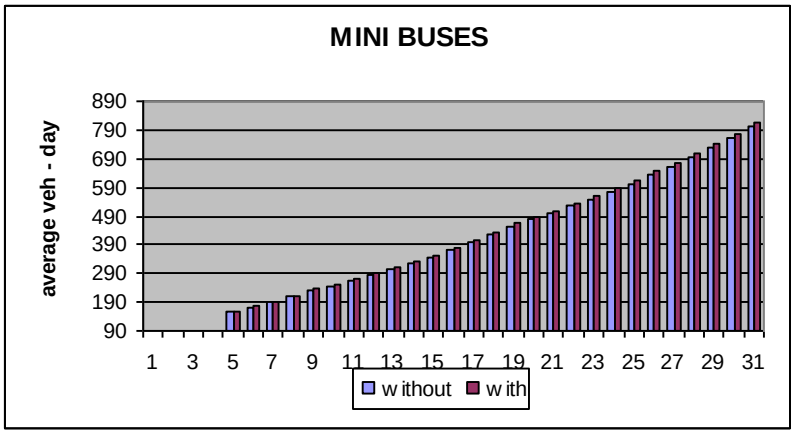
Trucks: traffic estimations



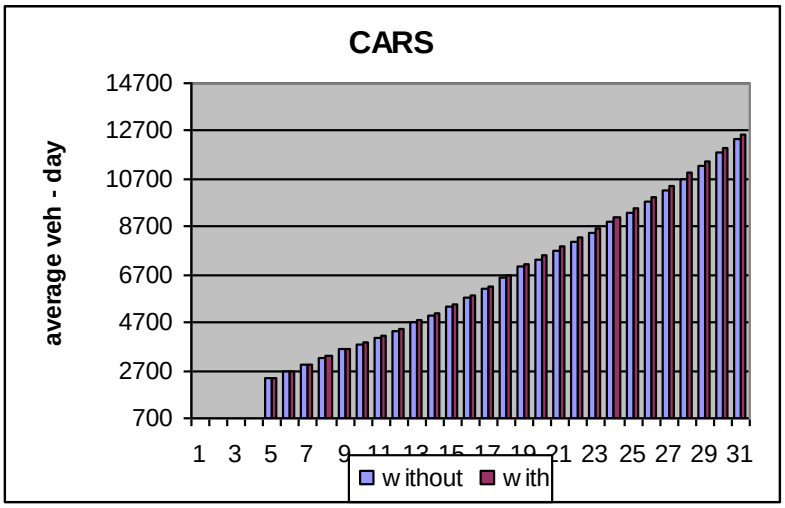
L / D buses: traffic estimations



Mini buses: traffic estimations



Cars: traffic estimations



Travel times estimations

According to our own technical findings during the field trips and the different interviews with key transport stakeholders (freight forwarders, truck drivers, police agents, etc.) we have elaborated and quantified a general structure of the practical travel times experienced by users along the NC.

Again, that information is not always 100% consistent among dates and sections and we have based our analysis, when necessary, on the main estimations on the central section. As a matter of illustration we are showing below the results from our direct observation along the central section of NC

First we have estimated the current average **vehicle speeds** on road by transport modes and road sections. These elements do not change between the reference and project scenario since no alignment transformations (distance, geometry, structural upgrades…) are considered.

Nevertheless we have considered the variable ***"effective section vehicle speed"*** which is the resulting vehicle speed after having considered all the technical voluntary and involuntary vehicle stops occurred during the travel sections.

Table: average vehicle speed on road by sections and transport modes

ROAD SECTIONS	Trucks		Long distance buses		Minibuses		Cars	
	Without	With	Without	With	Without	With	Without	With
Mombasa – Nairobi	33	33	55	55	55	55	72	72
Nairobi – Eldoret	33	33	50	50	55	55	70	70
Eldoret – Kampala	30	30	50	50	55	55	70	70
Kampala – Mbarara	32	32	52	52	60	60	72	72
Mbarara – Kigali	33	33	50	50	55	55	65	65

ROAD SECTIONS	Trucks		Long distance buses		Minibuses		Cars	
	Without	With	Without	With	Without	With	Without	With
Kigali – Bujumbura	28	28	48	48	48	48	60	60

Vehicle currently suffer from different types of sources of reduction in speed on road, as it was established in the Terms of Reference of the present study. In terms of transport modelling we have considered a current basic type of potential and involuntary travel interruption during vehicle journeys, which is the existence of severe **traffic bottlenecks** along the NC due to several raisons, such as:

- Discretionary police controls,
- Informal market activities that difficult and collapse traffic flows,
- Heavy vehicle practices of stopping within road premises
- proximity to weighbridges (technical stops)
- borders points (administrative / immigration stops)

In the case of **weighbridges** we modelled this possibility from the start (only for heavy traffic) since our observations suggested that these elements can severely distort traffic. But the practical implementation of and cohabitation of weighbridges within RSS (as we first intended) was found to be very difficult in administrative terms. Also, other raison is that other programmes are currently studying the case or weighbridges outcomes improving. Therefore we excluded the analysis of weighbridges from our study

Also, we excluded the effects of the **border stops** (even though we thought on maintaining the one in section Eldoret - Kampala). Border stops are surely a key source of traffic interruption and travel times downgrading but the fact that other programmes are currently focusing on the integration of administrative activities in border points (OSBOP11,..) and in the integration of trans-national services (police, immigration..) showed us that this effect could also be exclude fro our analysis

By contrast we include in our modelling a **voluntary** source of traffic stops such as **leisure time** in proposed RSS. This effect has been modelled taking care of avoiding technical inconsistencies in the study. Obviously some technical leisure needed vehicle stops have been modelled in the *Reference scenario*, differentiating by structure of section distance and type of vehicle.

Under the *project scenario* nevertheless we have modelled a certain level of increase in the parking times and stops (and therefore a marginal rise in journey times). The intuitions is that if we are considering a new network of RSS along the NC, and if we expect some practical external benefits from it, we have to consider therefore a bigger *consumption* of this new road service, even if that could means (in strict terms of transport user benefits) a relative downgrade in generalized transportation costs (*via* journey times) .

In the following tables we summarize the main travel time estimations under a without / with scenarios framework, and by types of vehicle and road section, in the case of the "central" NC section:

Tables: average time (minutes) parked: number and types of stops, by transport modes and road sections (central NC section)

TRUCKS

Reference scenario

weighbridges		borders		leisure		
stops	time	stops	time	stops	time	road sections considered
0	60,0	0		1	60,0	Mombasa - Nairobi
0	60,0	0		1	20,0	Nairobi - Eldoret
0	60,0	0	60,0	2	15,0	Eldoret - Kampala
0	60,0	0		1	20,0	Kampala - Mbarara
0	60,0	0	60,0	1	20,0	Mbarara - Kigali
0	60,0	0	60,0	1	25,0	Kigali - Bujumbura

Project scenario

weighbridges		borders		leisure		
stops	time	stops	time	stops	time	road sections considered
0	50,0	0		1	72,0	Mombasa - Nairobi
0	50,0	0		1	24,0	Nairobi - Eldoret
0	50,0	0	57,0	2	18,0	Eldoret - Kampala
0	50,0	0	0,0	1	24,0	Kampala - Mbarara
0	55,0	0	57,0	1	24,0	Mbarara - Kigali
0	55,0	0	57,0	1	30,0	Kigali - Bujumbura

L/D BUSES

Reference scenario

weight bridges		borders		leisure		
stops	time	stops	time	stops	time	road sections considered
0	20,0	0		2	40,0	Mombasa - Nairobi
0	0,0	0		2	15,0	Nairobi - Eldoret
0	20,0	0	45,0	2	15,0	Eldoret - Kampala
0	0,0	0		1	20,0	Kampala - Mbarara
0	0,0	0	60,0	1	20,0	Mbarara - Kigali
0	0,0	0	60,0	1	20,0	Kigali - Bujumbura

Project scenario

weight bridges		borders		leisure		
stops	time	stops	time	stops	time	road sections considered
0	16,0	0		2	48,0	Mombasa - Nairobi
0	0,0	0		2	18,0	Nairobi - Eldoret
0	16,0	0	40,5	2	18,0	Eldoret - Kampala
0	0,0	0	0,0	1	24,0	Kampala - Mbarara
0	0,0	0	54,0	1	24,0	Mbarara - Kigali
0	0,0	0	54,0	1	24,0	Kigali - Bujumbura

MINI BUSES

Reference scenario

weight bridges		borders		leisure		
stops	time	stops	time	stops	time	road sections considered
0		0		2	30,0	Mombasa - Nairobi
0		0		1	10,0	Nairobi - Eldoret
0		0	25,0	1	10,0	Eldoret - Kampala
0		0		1	15,0	Kampala - Mbarara
0		0	30,0	1	15,0	Mbarara - Kigali
0		0	30,0	1	15,0	Kigali - Bujumbura

Project scenario

weight bridges		borders		leisure		
stops	time	stops	time	stops	time	road sections considered
0		0		2	36,0	Mombasa - Nairobi
0		0		1	12,0	Nairobi - Eldoret
0		0	22,5	1	12,0	Eldoret - Kampala
0		0	0,0	1	18,0	Kampala - Mbarara
0		0	27,0	1	18,0	Mbarara - Kigali
0		0	27,0	1	18,0	Kigali - Bujumbura

CARS

Reference scenario

weight bridges		borders		leisure		
stops	time	stops	time	stops	time	road sections considered
0		0		2	45,0	Mombasa - Nairobi
0		0		1	20,0	Nairobi - Eldoret
0		0	30,0	1	20,0	Eldoret - Kampala
0		0		1	20,0	Kampala - Mbarara
0		0	20,0	1	20,0	Mbarara - Kigali
0		0	20,0	1	20,0	Kigali - Bujumbura

Project scenario

weight bridges		borders		leisure		
stops	time	stops	time	stops	time	road sections considered
0		0		2	56,3	Mombasa - Nairobi
0		0		1	25,0	Nairobi - Eldoret
0		0	27,0	1	25,0	Eldoret - Kampala
0		0	0,0	1	25,0	Kampala - Mbarara
0		0	18,0	1	25,0	Mbarara - Kigali
0		0	18,0	1	25,0	Kigali - Bujumbura

The case of the modelling of road bottlenecks impacts on traffic and travel times

As mentioned before -- and after excluding potential net time savings through the optimization of some current administrative and technical activities (border points, weighbridges) potentially to be provided in collaboration of a RSS new network -- the project will be in position of eliminating some negative effects on traffic which currently arise by the informal parking of heavy vehicles on the road shoulders along several points in the NC[14].

[14] By several reasons: informal markets, unregulated parking areas within roadways, police controls..

These road bottlenecks have been detected and studied during the consultant field mission, and estimated on around more than 40 specific sites (only in the *central* NC section), with different levels of relevance and potential impacts on travel times.

Some can be viewed as only slight and partial occupation of a road lane, whereas in other cases we have estimated points of **total blocking** of one of the road directions, allowing for a significant reduction in traffic effective speed, but also a sensitive downgrading in road security, since by moments vehicles in the NC must partially occupy the opposite lane in the roadway.

We have estimated the **effective travel time losses** in bottlenecks by analysing the following criteria:

- The magnitude (length in km) of the bottleneck influence as treated in the Highway Capacity Manual (HCM). This Manual proposes a magnitude of 0.5 Km. before and after the specific bottleneck point[15].
- The observed data and cases of parked vehicles during the consultant team's field mission along the NC.

We have estimated the total affected length (Km) for every detected bottleneck point in which we clearly observed parked heavy vehicles on the sides of the roadway, and the total cumulated distance length by the parked trucks.

We have used as an input for the estimations an average length for trucks of 17 m plus an extra length of 0.5 km before and after the bottleneck point, following HCM guidelines.

- Affected length on road section 1: 26 km.
- Affected length on road section 2: 12 km.
- Affected length on road section 3: 13 km.
- Affected length on road section 4: 6 km.
- Affected length on road section 5: 11 km.
- Affected length on road section 6: 4 Km.

Hence travel time lost by bottlenecks effects has been estimated by the difference between the observed required time for leaving the zones of informal truck parking and the travel time effectively needed under a theoretical scenario of a roadway free of informal parking and occupied areas.

The required travel time for leaving the zones of informal parking will depend on the levels of total or partial occupation of the roadway.

- In points of <u>partial roadway occupation</u>, since car overtaking is riskier (and even impossible most of the times) the effective vehicle speed in that section will be established as the very same speed of the slowest vehicle in that section. That is, the final general speed of all the vehicles will be similar to the speed of a truck, which reaches approximately 35 Km/h.
- In the case of the <u>total occupation of the lane</u>, according to the findings of our field mission, the average vehicle speed on that section has been estimated on approximately only 20 km/h, since all vehicles in both directions area required to absolutely share the remaining lane of the roadway.

[15] *Highway Capacity Manual, HCM 2010,. Transportation Research Board of the National Academies of Science in the U.S.A*. Chapter 10.

With these criteria in mind, the effective travel time savings estimations by the potential elimination of road bottlenecks and informal parking zones in the shoulder of the roadway have been estimated and quantified by road sections and transport modes.

Effective travel times and vehicle speeds

As a general summary of the final effects in travel times and speeds that affects both scenarios, and that are caused by all the possible sources of travel time reduction considered (leisure, bottlenecks, etc.) we show the below tables with all the relevant travel time data and final effective speed indicators in the case of the *central* section :

Tables: Final effective weighted average travel times and average speeds by transport modes along central NC section.

TRUCKS	Without	With
Effective travel time	63.3 h	61.1 h
Night sleep time	21.1 h	20.4 h
Total gross travel time	84.4 h	81.4 h
Effective speed	28.6 km/h	29.7 km/h

LONG DISTANCE BUSES	Without	With
Effective travel time	40.4 h	39.3 h
Night sleep time	13.5 h	13.1 h
Total gross travel time	53.9 h	52.5 h
Effective speed	44.8 km/h	45.9 km/h

MINI BUSES	Without	With
Effective travel time	36.8 h	35.7 h
Night sleep time	12.3 h	11.9 h
Total gross travel time	49.1 h	47.5 h
Effective speed	49.2 km/h	50.9 km/h

CARS	Without	With
Effective travel time	30.9 h	30.4 h
Night sleep time	10.3 h	10.1 h
Total gross travel time	41.2 h	40.5 h
Effective speed	58.7 km/h	59.7 km/h

4.2.3. USER BENEFIT AND PROJECT OUTCOMES

Generalized transport costs

The demand for a transport service depends mainly on its **generalised transport cost** (also in other factors such as the competing modes or routes, etc). Generalised cost of transportation expresses the overall inconvenience to the transport user of travelling between a particular origin and destination by a particular mode. In practice, generalised cost is usually computed as the sum of: a) true direct monetary costs (e.g. fares for public transport, perceived operating costs and tolls for private modes) plus b) the value of travel time, which is calculated in equivalent monetary units.

In practical terms, the project main impact will be perceived by the users through a change in the generalised transport costs on along the NC. Hence the new RSS network infrastructure will eliminate selected congestion / bottleneck points, will upgraded levels of services and externalities outcomes (road security, health conditions, wider economic development effects..) and clearly will reduce travel times and (through the relevant variables such as vehicle speed, fuel consumption,...) will upgrade travel costs[16] (VOC's).

The translation from time to cost is made using estimations of the **value of travel time** available from current literature or possibly from dedicated field surveys.

From our experience in other developing countries in Africa, we have adopted the following values of time (we think they are definitively conservative values) for the specific purpose of this study, and taking into account that different countries with very different macroeconomic conditions are involved (Burundi versus Kenya; DRC versus Kenya..) :

Table: estimation of values of time by types of transport users

VALUES OF TIME

	BT	NWT	BT	NWT	VoT	
car users	60%	40%	0,70	0,23	**0,51**	US$ / hour
Freight truck drivers	70%	30%	1,20	0,40	**0,96**	US$ / hour
Freight cargo	75%	25%	4,00	1,60	**3,40**	US$ / truck - hour
L/D buses drivers	80%	20%	0,90	0,45	**0,81**	US$ / hour
L/D buses pax	65%	35%	0,75	0,38	**0,62**	US$ / hour
Matatu drivers	90%	10%	0,50	0,20	**0,47**	US$ / hour
Matatu pax	65%	35%	0,50	0,17	**0,38**	US$ / hour
Elasticity GDP: 0,7%						

In the following table we have summarized all the relevant components (time, fuel, maintenance,..) of the **generalized costs of transport** by types of users, and the change experienced by user costs between reference and project scenarios, for the (illustrative) case of the journey Mombasa – Bujumbura.

[16] The socio economic effect in society is the change in Social Surplus which is the sum of changes in producer surplus (PS) and Consumer Surplus (CS). But whereas a RSS programme would have clear effect in user costs, or CS (journey times, perceived VoC for private cars,.), it is not so clear (from our point of view) the direct effect of a RSS programme in operational income and other fixed operational costs of transport services providers16 (that is, PS) apart from the fact (already explained) of the commercial effects of better journey times, but that effect is a user effect not a producer effect. In summary all the calculations presented in the report are the estimations of, first, the changes in user costs (with / without), differentiating by types of users (car users, l/d buses, trucks, mini buses, and both for drivers and passengers and for cargo), and the estimations of external effects, RSS costs (capital, and operational) and RV.

It should be noted that in order to give coherence with the assumptions exposed in this document we have considered the following important arguments in transport modelling:

- As we mentioned before, we assume that transport users will increase the time spent in leisure and non work activities at the different RSS along the NC. This is why, although there is a general reduction in travel times, we have maintained a specific and coherent rise in leisure times
- Currently there are no tolls in NC central road section, and we have maintained this assumption under the "with" project scenario. Besides, we have not considered a potential *access fee* for the RSS network and therefore GCT do no consider any direct monetary payment

Therefore, with these assumptions in mind, all the costs estimations, for the *central* section, are shown in the table below:

		REFERENCE SCENARIO				PROJECT SCENARIO			
G. TRANSPORT COSTS		trucks	l/D buses	Minibuses	cars	trucks	l/D buses	Minibuses	cars
	unit								
Time	US$ / veh - trip	336,8	782,8	158,6	31,7	325,0	762,3	153,5	31,2
Fuel	US$ / veh - trip	471,9	401,6	128,9	130,8	465,2	399,3	126,9	130,0
Deprec	US$ / veh - trip	-	-	-	-	-	-	-	-
Maint.	US$ / veh - trip	108,2	55,5	81,8	75,7	108,2	55,5	80,6	75,1
Lubric.	US$ / veh - trip	26,0	22,2	5,9	5,5	25,7	22,0	5,9	5,5
Tyres	US$ / veh - trip	-	-	-	-	-	-	-	-
RSS a.fee	US$ / veh trip	-	-	-	-	0,0	0,0	0,0	0,0
Total G.T.C	US$ / veh trip	943,0	1.262,1	375,2	243,8	924,1	1.239,1	366,8	241,8

Externalities

An externality is said to exist when the production or consumption of a good in one market affects the welfare of a third party without any payment or compensation being made. The most evident externalities arising when transport projects are implemented are related to both environment and safety issues.

Road safety conditions

Road accidents represent an important cost for the society, both financially and socially, which must be assessed. The safest alternatives, such as motorways, reduce the number of accidents and therefore the cost of accidents, and are a benefit for the alternative analyzed.

A new network of RSS in the NC will have the effect of allowing better places for rest to truck drivers and other users, lowering probably the average time spent by drivers at work (driving) and preventing from potential road accidents.

Accidents lead to death and injury, the number or accidents on each of the alternatives must therefore be determined. In this study we have simulated some danger and mortality indexes. Once the number of deaths and injuries is obtained for each alternative a monetary value is assigned by allocating an economic value. In this way, the cost per accident will be defined by the following equation:

$$CPA = ND \times CD + NI \times CIP$$

Where:

CPA: Cost per accident

ND: Number of deaths

CD: Cost of a death

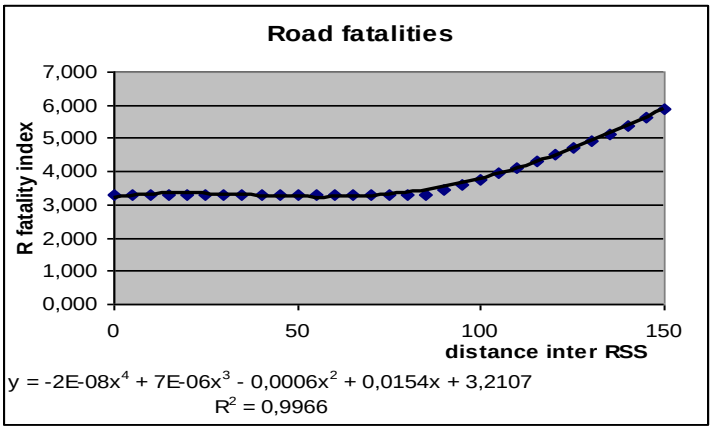
NI: Number of injured persons

CH: Cost of an injured person

Based in regional data on accidents and fatalities we have simulated a *fatality index* related to the number of RSS (in fact it is related on RSS density: average distance between RSS) and the figure below shows the pattern that we have estimated.

We have applied the net outcomes of this analysis to the estimation of positive externalities in our general Cost - Benefit Analysis framework.

Figure: Road fatalities index and number of RSS



Health (HIV / aids) conditions

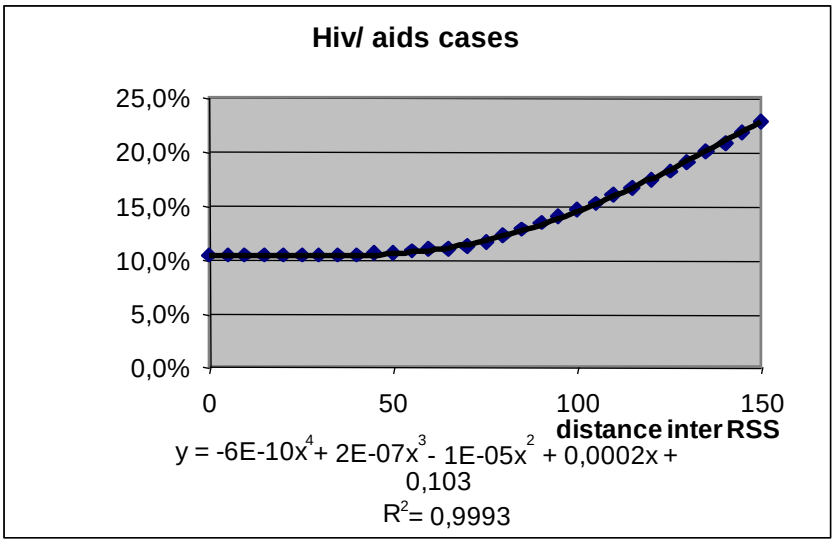
Another important potential impact from the new RSS network will be a theoretical reduction in HIV / aids cases derived from the fact of a possible decrease in risks cases (and therefore in further infected cases) as a consequence of strong informative activities within the RSS network and also the prohibition of risk activities (namely, prostitution) on the premises of the RSS.

We have used some estimates of current countries prevalence HIV / aids rates (around 6.3%) and we have simulated a pattern of possible reduction in potential cases (as a % of nights spent during travel times) of risk encounters and therefore, in potential further infection cases.

Again, we have simulated a *HIV / aids risk index* related to the number of RSS (or the average distance between RSS) and the figure below shows the general outcomes reached.

We have applied the net outcomes of this analysis to the estimation of positive externalities in our general Cost - Benefit Analysis framework.

Figure: HIV / aids risk index and number of RSS



Economic development

It is a current practice in Cost - Benefit analysis that the indirect benefits derived from the multiplying effect of the investment, such as generation of employment, increase in commercial, industrial activity, etc should not be included in the analysis. The intuition is that if these benefits are included, the opportunity cost to invest in other types of activities or sectors must also be included.

But recently more disaggregated work has partially confirmed certain evidence that there are *wider economic effects* in some infrastructure investment projects. But the fact is that there is little prospect of developing simple rules of thumb to factor wider impacts to project appraisal

For instance, according to the works undertaken in the UK for the SACTRA[17], a possible appraisal method could be:

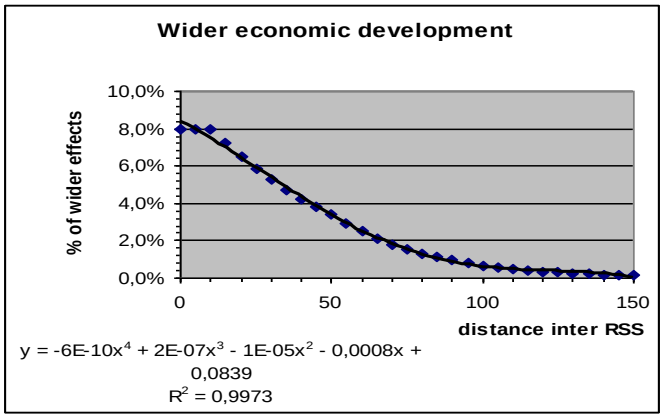
Wider impact of increased output by firms = 0.1 x business & freight user benefits

We have used the previous framework and we have simulated a pattern of possible relation between *an index of the multiplier of economic* (wider) effects and the number of RSS (or the average distance between RSS).

The figure below shows the general approach and relations obtained. We have applied the net outcomes of this analysis to the estimation of positive externalities in our general Cost - Benefit Analysis framework.

[17] Standing Advisory Committee on truck road appraisal (SACTRA)

Figure: % of potential wider effects and number of RSS



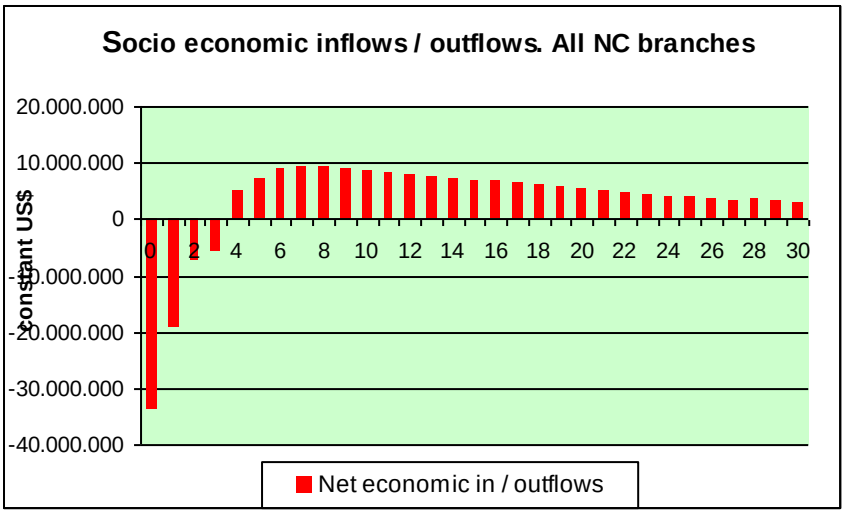
Project appraisal outcomes

With all previous considerations in mind we have projected all relevant **economic project inflows and outflows.**

For the economic modelling stages we have used a clear conservative approach by applying a **social rate of discount of 12%,** which is the current hurdle rate applied by World Bank procedures in project appraisal.

The economic (discounted) cash flow pattern (for all NC sections, not only the central) is presented in the figure below.

Figure: Economic profile of project social net benefits



The graph is quite self explanatory since all the final net economic flows are *discounted cash flows*, and therefore we can appreciate that the project generates more than sufficient **economic value** as to out-weight all the capital costs and mitigations costs.

We show a more numerical element of analysis in the table below, in which we present the key economic and social profitability ratios obtained for the alternative under analysis.

PROJECT EIRR	%	20,78%
PROJECT NPV	000'	99.891
P/B RATIO	years	10,00
SOCIAL RATE OF DISCOUNT	%	12,00%
BENEFIT - COST RATIO	#	2,242

Hence, the **Economic Net Present Value** obtained for the project 67 RSS scenario is clearly positive (+99.89 mill US$ in constant prices). This means that the benefits generated by the project are fully sufficient to compensate the rise in costs, both of the investment and of operation.

Given that the project have a positive ENPV we can obtain an **Economic Internal Rate of Return (EIRR),** that is, the rate that would make the NPV equal to zero. **The EIRR of the project reaches 20.77%** which is a fair value if we compare it with the opportunity costs of public funds (or social rate of discount) settled in **12%**.

As a matter of comparison we can show the economic outcomes that could be reached for the central section of NC:

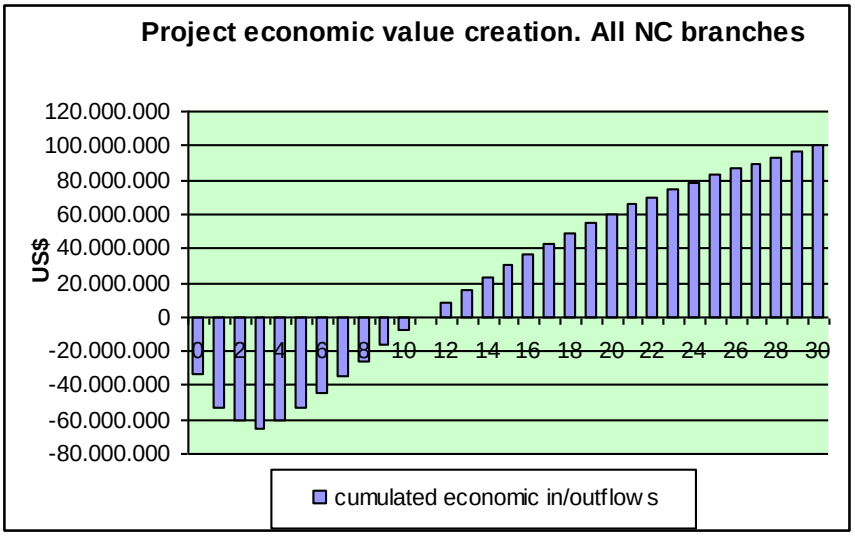
PROJECT EIRR	%	23,85%
PROJECT NPV	000'	88.014
P/B RATIO	years	10,00
SOCIAL RATE OF DISCOUNT	%	12,00%
BENEFIT - COST RATIO	#	2,827

It is very intuitive the comparison since we are “adding” to the NC central section more links that are nevertheless of low density in terms of RSS. That leads to a lower generation of social benefits (reductions in GTC, fewer externalities..). That is the key reason for only reaching a 20.78% of economic return when considering the “integral” NC, instead of a 23.85% of Economic return when considering the relatively dense central section of NC

The discounted Benefit - Cost ratio gives an idea of the relative magnitude of the economic benefits generated over the costs incurred. It could be said that the benefits generated represent approximately 2.2 times the direct and social costs incurred.

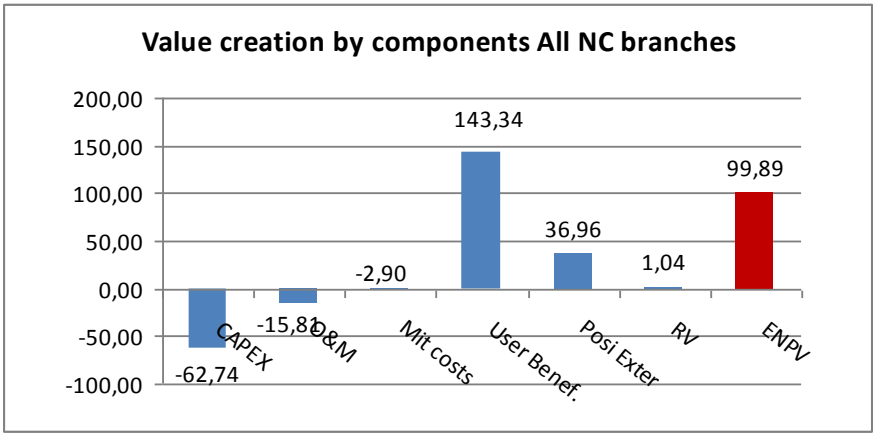
Finally the Pay Back indicator shows that the investment made will be fully recovered after 10 years (high liquidity). This can also be clearly appreciated in the graph below in which we represent the cumulated discounted economic project cash flows.

Figure: Economic profile of project social cumulated net benefits



As a final project summary we are showing below (in terms of Present Values) all relevant component of the final project ENPV of **99.89 mill US$:**

Figure: distribution of Economic value among components (US% Present Value)



	ALTERNATIVE 1 (1INCREMENTAL IN / OUTFLOWS)	67 RSS	years	2014 YEAR 0	2015 YEAR 1	2016 YEAR 2	2017 YEAR 3	2018 YEAR 4	2019 YEAR 5	2020 YEAR 6	2021 YEAR 7	2040 YEAR 26	2041 YEAR 27	2042 YEAR 28	2043 YEAR 29	2044 YEAR 30	precios Sombra
INVESTMENTS	RSS Programme Capital costs	US$		31.263.290	19.105.344	9.552.672	9.552.672	0	0	0	0	0	0	0	0	0	0,95
	Mitigation costs	US$		1.532.791	1.532.791	0	0	0	0	0	0	0	0	0	0	0	0,95
	Residual Value	US$		0	0	0	0	0	0	0	0	0	0	9.263.197	9.263.197	9.263.197	
	RSS PROGRAMME INVESTMENTS			**-32.796.081**	**-20.638.135**	**-9.552.672**	**-9.552.672**	**0**	**0**	**0**	**0**	**0**	**0**	**9.263.197**	**9.263.197**	**9.263.197**	
OPERATIONAL COSTS	**RSS cost structure**																
	Operational / maintenance costs	US$		872.959	1.406.435	1.673.172	1.939.910	1.939.910	1.939.910	1.939.910	1.939.910	1.939.910	1.939.910	1.939.910	1.939.910	1.939.910	0,9
	Overheads	0,0% US$		0	0	0	0	0	0	0	0	0	0	0	0	0	
	C.O.G.S			**-872.959**	**-1.406.435**	**-1.673.172**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	
	other costs																
	TOTAL COSTS			**-872.959**	**-1.406.435**	**-1.673.172**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	**-1.939.910**	
	TOTAL OUTFLOWS (OPEX + CAPEX)			-33.669.040	-22.044.570	-11.225.844	-11.492.582	-1.939.910	-1.939.910	-1.939.910	-1.939.910	-1.939.910	-1.939.910	7.323.287	7.323.287	7.323.287	
SOCIAL BENEFI	**User cost savings (GTC)**	US$		0	733.897	1.916.286	3.322.921	8.154.407	12.000.414	16.291.815	17.861.374	56.558.501	59.312.520	62.201.661	65.232.604	68.412.358	
	Externalities (accidents)	US$		0	0	78.582	205.185	873.128	1.320.866	1.930.977	2.630.163	8.085.786	8.463.490	8.858.892	9.272.823	9.706.154	
	Externalities (Health)	US$		0	0	40.787	106.500	453.192	611.754	819.443	1.052.865	3.031.762	3.163.279	3.300.494	3.443.652	3.593.010	
	Externalities (wider economic effects)	US$		0	0	12.346	55.899	237.867	521.018	938.669	1.272.329	3.987.892	4.180.016	4.381.463	4.592.689	4.814.171	
	TOTAL SOCIO ECONOMIC BENEFITS			**0**	**733.897**	**2.048.000**	**3.690.505**	**9.718.595**	**14.454.053**	**19.980.903**	**22.816.730**	**71.663.942**	**75.119.306**	**78.742.511**	**82.541.768**	**86.525.694**	
DIFFERENCE BENEFITS - COSTS				-33.669.040	-21.310.673	-9.177.844	-7.802.077	7.778.685	12.514.143	18.040.993	20.876.820	69.724.032	73.179.396	86.065.798	89.865.055	93.848.981	
SRD	**12%**																

PROJECT EIRR	**%**	**20,78%**
PROJECT NPV	**000'**	**99.891**
P/B RATIO	**years**	**10,00**
SOCIAL RATE OF DISCOUNT	**%**	**12,00%**
BENEFIT - COST RATIO	**#**	**2,242**

5. RECOMMENDATIONS OF FRAMEWORKS TO OVERSEE AND MANAGE THE ROADSIDE STATIONS

The pertinent Public Administration must have the skills and multidisciplinary knowledge necessary to adequately and efficiently manage an important, complex and innovative Project such as this. Part of this knowledge is available on the market, through Advisors in different aspects (Engineering, Environmental, Legal, Financial, Marketing …).

On the other hand, it is important to point out the existence, in the different countries, of legislation and organizational structure (sometimes consolidated and sometimes under development) able to take part in projects like this.

This means that, besides the implementation of any new Entity at regional level that carries out (or coordinate) the development of the project, the conditions attributed by the National Laws must be taken into account in the different phases of the project.

This report develops in detail and strongly recommends the creation of a single Entity as a Regional Coordinating Unit that supervises and manages (coordinates) the Project in a global way, with the functions and capacities defined in this document.

It is essential the coordination of the National Entities (National Coordinating Units within Ministries, for instance) that, according to the legislation of each country, have responsibility in the implementation of the RSSs inside each country.

This chapter begins by identifying and analysing the current structure, skills and functions of the Public Entity that is going to develop the Project.

We identify and define the role of the Entity and we recommend the structure required to perform its functions. We draw attention to the fact that the Structure can (should) be different for the following Project development stages:

1. Take off. (Including preliminary studies through to contracting for the different RSS)
2. Investment (Including Construction)
3. Operation (Including Tests and Trial Runs)

As part of Stage 1 (Take off) we recommend the best way to manage contracts in accordance with the process and criteria that we describe below. We assume that the entity is not going to manage any of the RSS directly. This means that the contracts will follow two main principles, and that alternative principles will be defined as they arise:

- The Entity finances the Infrastructure. Construction is contracted out to Contractor(s) and Operation is later contracted out to Operator(s).
- The Entity contracts one Concessionaire for the Development and Operation of each RSS.

In both cases the conditions that the Contractors and/or Operators must meet will be defined in accordance with the specifications of functions and qualities (of the construction and the service).

The economic and financial studies contained in this Report determine whether certain Public contributions are necessary to make the Projects economically and/or financially feasible. The type of contribution and the amount are obtained as outputs of the analysis.

5.1. INTRODUCTION

We understand that the process of coordination and monitoring should preferably be undertaken by TTCA-NC. Within this initiative, the new structure as a coordinating unit will take place.

As detailed below, the TTCA-NC has the power to develop a project like the RSS Project. However, as shown by Strategic Plan 2012-2016:

3.4.1. Conclusions

…./….

(i) For a successful implementation of the strategic plan, the Secretariat must have both the human as well as financial capacity. As funding from the member States is often not sufficient, mobilization of extra budgetary resources is essential for the implementation of programme activities.

…/…

(iv) Appropriate levels of staffing will be required in order to establish an effective monitoring and evaluation mechanism.

(v) TTCA-NC member States need to have first adopted PPP policies and regulatory frameworks, as well as establishing appropriate Units to initiate and manage PPP projects

…/…

3.4.2. Recommendations and the Way Forward

…/…

(i) The TTCA-NC organizational structure will need to be reviewed in order to incorporate the monitoring and evaluation function, as well knowledge management and public relations functions

(ii) Review recruitment procedure to enable the secretariat to rapidly fill positions falling vacant

…/…

(viii) Technical assistance will be required for the execution of some of the programmes, such as the Northern Corridor Spatial Development Programme.

The Organization is aware of this. The different documents and recommendations analyzed confirm the assignments and commissions that the General Secretariat should follow in order to advance the provision of resources for addressing those shortages.

According to the information that we have about the actions assigned, while we believe that they are on the right track, we recommend that specific deadlines are established in order to provide the necessary staff.

In any case, due to the complexity of the processes, especially if, as originally intended, the private sector is to be involved in the development of the RSS Project (with the level of participation proposed in this study), the use of external experts (Technical, Financial and Legal) at the different stages of the process appears to be essential.

5.2. TTCA-NC RESPONSIBILITIES

a. Deriving from the Agreement

The articles of the Northern Corridor Transit and Transport Agreement are listed below incorporating issues related to the implementation of projects in the Corridor:

Article 6: Establishment of the Authority
For the purpose of exercising jurisdiction over the coordination and implementation of the corridor activities under this Agreement, the contracting parties agree:

i. The Authority herewith established is an international organization with legal personality with capacity and power to enter into contracts, acquire and dispose of immovable and movable property, to sue and be sued, and all other legal powers necessary for the proper exercise of its functions

Article 7: Organs of the Authority

For the proper carrying out of its functions, the Authority is comprised of the following organs:

a. The Council of Ministers

b. The Executive Committee

c. The Specialized Committees

d. Public Partnership Committee

e. The Permanent Secretariat

Article 8: Composition and functions of the organs of the Authority

c. The Specialized Committees

The Specialized Committees …….. shall be responsible for implementations of aspects of transit transport operations in their specialized areas and in doing so, the specialized committees shall do the following:

i. Prepare implementation strategies for corridor operations

d. The Public Private Partnership Committee

The Public Private Partnership Committee ….shall carry out the following functions:

i. Identify existing problems within their areas of operation and to solve them

e. The Permanent Secretariat

The Permanent Secretariat shall carry out the following functions:

i. Provide technical and analytical support to the Authority´s organs in the form of strategy formulation, project identification, analysis of national standards and practices, collection and storage of data and statistics, and any other task and study that may be assigned to it by the appropriate organs of the Authority in technical, economic, institutional and legal matters

ii. Set performance indicators and monitors their implementation

Article 15: Facilities

The Contracting Parties shall, in partnership with the private sector, provide, maintain and operate stop over facilities, at designate places, which shall include storage,

buildings, loading and unloading and other ancillary facilities, accommodation for drivers and other operating staff, at places and under conditions specified in protocol No. 2 (two) to this Agreement.

Protocol 2, Article 6: Facilities for road traffic:

The contracting parties agree to make, whenever possible, the following facilities available for traffic in transit along the roads specified in section 1 of this Protocol, against payment of costs for effects and provisions acquired and charges for services rendered according to the rates that apply to the nationals of the country in which facilities are used:

i. *First aid services and other assistance in the case of accident*
ii. *Repair facilities in case of break-down of vehicles*
iii. *Fuel filling stations*
iv. *Post and telecommunication offices*
v. *Facilities for loading, unloading, break bulk (where necessary)*
vi. *Storage areas and building*
vii. *Restaurants and stopover rest facilities)*

Article 49: Infrastructure Development

In order to enhance infrastructure development through the transformation of the Corridor into an economic development corridor, the contracting parties agree to take all necessary measures that may include:

(d) Enactment of enabling legislation

(e) Joint implementation of projects

Article 50: Limitation as regards charging

No duties, taxes or charges, provisional or municipal, shall be levied on traffic in transit, except for administrative charges applicable on traffic in the territories of the contracting parties, included charges levied on the use of road tolls, bridges, tunnels and ferries, warehousing and parking fees, or other similar charges and taxes imposed on services rendered and on purchases made during the journey.

We can therefore conclude, that the TTCA-NC has, among its duties, and is authorized to, developing investment projects, such as the RSS, within the Northern Corridor

b. Outlining each Committee's function

The institutional structure of the NC-TTCA has several Committees, reporting to the General Secretariat, which meet regularly. These Committees are responsible for planning and carrying out studies (generally awarded to independent entities with the necessary knowledge and experience). The work done is submitted for consideration to the TTCA decision making Organs who determine and issue recommendations for action.

Two of these Committees: "Infrastructure, Development and Management" and "Public Private Partnership", have been developing certain works whose conclusions and

recommendations should be taken into account for the implementation of the RSS Project.

It is also worth mentioning the "Customs & Trade Committee", since the RSS Project can contribute to the rationalization of some of the functions which, at this stage have become increasingly inefficient.

c. The lack of executive structures

While the General Secretariat is responsible for "Monitoring the Implementation of the decisions taken by the policy organs of the Authority" as has been established by the Secretariat itself, it does not seem that it has the available infrastructure for the development and implementation of specific projects.

As we will show in our recommendations, it will be necessary to have project specific staff for the implementation and coordination of the RSS Project (with the composition and functions described, depending on the General Secretariat), in order to assure the project success.

5.3. DOCUMENTATION AND PLANS ANALYSED

- The Northern Corridor Infrastructure Master Plan (May 2011)
- TTCA-NC- 5 Year Strategic Plan 2012-2016. Info and Recommendations Technical Committee October 2011
- Report of the 7th Specialized Technical Infrastructure Development and Management Committee meeting and the 4th meeting of the Private Sector Investment Promotion Program. 15-19 April 2013

From the documentation analyzed**, we can** transcribe the recommendations that we understand must be taken into account for the implementation and monitoring of **the** RSS

- **The Northern Corridor Infrastructure Master Plan (May 2011)**

  NCTTCA´s primary role should be to facilitate the coordination and implementation of Level 1 projects through a variety of activities such as overseeing of feasibility studies, coordination among the governments involved, liaising with international financial institutions, etc. For PPP projects, NCTTCA´s primary involvement is again directed toward Level 1 projects; however, its expertise could be used for Level 3 and Level 3 projects if desired.
  (Level 1 are infrastructure projects of regional importance which provide services to three or more NCTA member countries)

  NCTTCA should act to facilitate the adoption of these recommendations by all member countries:

  …….

  Improving the capacity to implement PPP projects

  In all NCTA member countries, those transport planning documents reviewed by the NCIMP Consultant indicate much greater reliance on the use of PPP as a means of implementing a variety of projects, but these expectations are often

made without a clear understanding of the difficulties for ensuring a successful PPP outcome. Based on our international experience, most of these types of projects do not achieve their goals for a number of reasons. If PPP structures are weak or their goals are unrealistic, then the likelihood of achieving a successful PPP project is very small.

1) Legal and regulatory setting

Legal, regulatory and institutional structures need to be in place so that they can attract experienced private sector partners who are qualified technically and financially to undertake the project. If not, the PPP project will only attract less than qualified bidders who are technically weak and/or cannot mobilize the necessary financial resources to implement the project in a timely manner, or not at all. In addition, the PPP project must have realistic goals and as such, the risks and possibly the costs, will need to be shared between the private and public sector partners. In larger undertakings, this requirement implies that the Government will have to be a real partner and not a silent one.

Without a proper understanding of what can and cannot work, governments often structure the project poorly and strongly in their favor. Under these circumstances, the concessionaire will perform poorly, and most likely there will be a need for a major mid-course correction such as termination or a restructuring of the agreement. Both of these activities will be difficult to implement, and in the process no real progress will be made to accomplish the goals of the PPP project. A relevant example of this failure of expectations is the railway concession agreements between RVR and the Governments of Kenya and Uganda.

To attract better quality partners, the public sector has to provide a level playing field, a method of sharing risks (and possibly costs), and transparent procedures. In addition, the PPP project must be well structured so that it is attractive to qualified bidders by providing a realistic rate of return to the future private sector partner. Getting all of this right is no easy task.

Having similar legal and regulatory structures in NCTTA member countries, or more generally at the EAC or COMESA levels, will provide a more attractive regional environment for experienced companies with backgrounds in implementing successful PPP projects. This would also increase the probability of achieving the desired outcomes or goals of the project. A project sheet for technical assistance directed toward preparing such legal and regulatory documents for the NCTA member countries is given at the end of this chapter.

2) Implementing PPP projects along the Northern Corridor

As far as the Northern Corridor is concerned, the lack of PPP capability adversely impacts the possibilities for taking maximum advantage of the private sector involvement in funding, managing or operating existing infrastructures and/or transport systems presently managed by the government directly or through government owned organizations. For instance, at the port of Mombasa, the role of the private sector is still constrained because there is a lack of political will, to achieve productivity levels comparable to other ports in Africa.

Likewise, the role of the private sector in terms of the implementation and operation of new projects such as the standard gauge railway projects has not yet

been defined. These and many other opportunities are more likely to be achieved if there is an institution capable of facilitating these processes and advising the private sector on opportunities in the Northern Corridor in the transport sector. There is one such organization that could initially take on this task, the NCTTCA.

The NCTTCA could develop a small PPP Unit which could first be made available and then eventually be spun off to the governments of the member states once their capacities to facilitate these efforts have been built.

- **TTCA-NC- 5 Year Strategic Plan 2012-2016**

SO1: Development of opportunities and incentives for increased private sector investment and participation in the Northern Corridor
Program Objective: To provide an enabling policy and legal framework for the promotion of private sector participation in the provision of infrastructure facilities and services.
Main Activities: Review of existing policies and legal frameworks for investment promotion with a view of harmonization.
Develop a common PPP policy framework, in collaboration with EAC and COMESA, for adoption by NC countries.
Support members States in establishing PPP units
Capacity building for knowledge sharing on ongoing PPP initiatives
Targeted Outputs: A common policy and legal framework for investment promotion
Common policy framework
Guidelines for establishment of PPP units
PPP units established in all members States
Document on best practices and training workshop on PPP
Performance Indicators: Number of countries adopting the common policy and legal framework for investment promotion
Countries adopting and using the common PPP policy framework Guidelines
Number of PPP units established by NC
Number of training workshops on PPP
Time Frame: 2012-2014
Estimated Cost: 2.0 million USD
Responsibility: NCTTCA, Member States, Donors
SO2. Expansion, modernization and improvement of transport Infrastructure and Services relating to roads, rail, pipelines, ports, inland waterways, border posts, terminals, communication systems and other related facilities

4. *Program Objective. To reduce transit truck delays caused by repeated weighing at several weighbridges*

Main Activities. Establishing a regional network of weighbridges along the corridor. Harmonization of data capture format to be used at all weighbridges. Computerization and networking of regional weighbridge stations to facilitate data exchange
Targeted Outputs. Implementation of a regional system to control vehicle overload Performance indicators: Reduction in number of weighbridges and repeated weighing of transit vehicles.
Time Frame. 2012-2015

Estimated Cost. US$ 3 million.
Responsibility. Member States and TTCA-NC in collaboration with EAC, COMESA&SADC

7. *Program Objective. Promote safety across all transport modes.*
   Main Activities. Improve road safety and security along the highways.
   Targeted Outputs. Construction of appropriate off road parking stops to prevent accidents at night caused by vehicles parked by the roadside, as well as providing other amenities for drivers
   Performance Indicators. Number of safe parking facilities developed along the NC in each country as part of the roadside amenities.
   Time Frame. 2012-2016
   Estimated Cost US$ 15 million.
   Responsibility. Ministries of Infrastructure and Road Authorities of the Member States

SO4. Enhanced Knowledge Management and Capacity Building

1. *Program Objective. To enhance the efficiency and effectiveness of implementation*

   Main Activities. Study for a resource mobilization strategy. Review the structure to incorporate missing Secretariat functions and to facilitate participation of other key government agencies and the private sector.
   Targeted Outputs. Study Report and recommendations for the consideration of member States. An enhanced structure enabling wider participation of government agencies and the private sector. Missing functions to be incorporated in the Secretariat Structure.
   Performance Indicators. Resource mobilization Strategies adopted. Enhanced structure implemented. Missing functions at the TTCA-NC Secretariat filled.
   Time Frame 2012-2014
   Estimated Cost US$ 0.5 million.
2. *Implementation Plan*

   The technical programmes (1. Public-Private Partnership Investment Promotion, 2. Infrastructure Development and Management, amongst others ….) do exist in the Secretariat´s organizational structure. However performance monitoring and evaluation is currently not part of the structure. It is assumed that for the Strategic Plan 2012-2016, the missing secretariat functions will be incorporated into the structure and the positions will be filled. With this assumption, programming for implementation of the strategic plan 2012-2016 is herein outlined.
   …/…
   8.2.1. Funding and Resource Mobilization
   …/…
   A very important assumption is that the necessary financial resources to execute the plan will become available. The member States shall play a pivotal role in funding the Secretariat. At the same time the Secretariat will clearly identify areas where extra-budgetary funding will be needed, and will prepare projects, including technical assistance projects, to solicit funding from various sources. Part of the resource mobilization strategy will be the promotion of PPPs as means of raising project funds, especially for the infrastructure related projects.
   …/…

8.2.2. Human Resources

As mentioned earlier, reaching the objectives and outputs of the previous strategic plan was somewhat curtailed by inadequate level of staffing. It is therefore expected that the TTCA-NC Executive Committee will approve the missing functions in the Secretariat´s organizational structure.

…/…

It is further assumed that the vacant positions will be filled as soon as possible; otherwise implementation of the strategic plan will be affected.

- **Report of the 7th Specialized Technical Infrastructure Development and Management Committee meeting and the 4th meeting of the Private Sector Investment Promotion Program. 15-19 April 2013**

69. In collaboration with Trade Mark East Africa (TMEA), the TTCA-NC Permanent Secretariat is carrying out the Road Side Stations Project (RSS). The main objective of the RSS is to identify rest stops for cargo trucks along the entire transport corridor. The RSS are to be developed through private Sector investment and are expected to be used as One-Stop Centre for other future trade facilitation activities and information such as on Road Safety, Socio-Health Issues, other IT and Trade Information

70. TMEA is also financing a complementary assessment study on Road Safety and Socio-Health Issues of cross-border HIV/AIDS, services which are also to be delivered within the RSS. …..

72. The Road Safety component of the RSS study aims at developing awareness and hence tackles one of the 4 Es- Education- to enhance road user behavior. There is a need to develop programs which tackle the other 3 Es- Engineering, Enforcement and Emergency care. The TTCA and Member States should develop programs and projects to tackles the 4Es in a simultaneous yet coordinated manner therefore maximizing the impact of all planned interventions.

…/…

110. Challenges relating to the lack of sufficient parking space for transit vehicles are currently being faced at various borders. As a result, it takes a long time for the cleared trucks to be allowed entry into the country. Expediting the development of the OSBPs will provide parking space for trucks awaiting clearance at the borders among other issues.

…/…

114. A summary of the Road Side Stations project was presented by a representative of Trade Mark East Africa "TMEA". The project aims to enable truckers to stop at appropriate places and in appropriate/safe facilities namely, a network of well planned Road Side Stations (RSS).

115. The Technical Committee congratulated the initiative which would not only promote the reduction of road accidents and loss of life and goods by reducing the tiredness of the truckers, but would also improve safety and health, and provide job opportunities and the creation of business from the RSS activities.

Recommendation:

The Technical Committee recommended that the Permanent Secretariat should maintain an efficient synergy with TMEA so that such an important project could be put in place enabling the improvement of truckers and passengers safety and health, as well as the safety and health of the population living along the Northern Corridor.

…/…

- **The progress of activities and initiatives on the investment promotion programme**

…/…

Recommendations

The Committee recommended that the Secretariat work closely with those member States that have not put in place the Policy and Legal frameworks for investment promotion and PPPs.

…/…

The Committee commended the Secretariat´s Road Side Stations (RSS) / Truck Stops Initiative and urged TTCA to work closely with TMEA regarding the initiative with a view to coming up with clear actions and recommendations for PPPs. Furthermore the Committee recommended that an Investors Conference be organized to market the RSS study investment opportunity to regional investors.

…/…

The Committee further encouraged the Secretariat to work closely with member States to strengthen ongoing efforts to pursue funding opportunities for infrastructure development and project preparation funds under the ADB/NEPAD-IPPF programme. The funding will enhance the capacity of member States in project preparation activities to access funding for the preparation of priority Transport Infrastructure projects as identified in the Northern Corridor Infrastructure Master Plan, as well as promoting PPPs initiatives in Transport Infrastructure Development.

…/…

The Committee recommended that the Secretariat amend the matrix in annex V as discussed and submit it officially to member States no later than 30th April 2013. The Member States pledged to fill and compile data on PPP investments and submit it to the Secretariat before the end of May 2013

The Committee urged the Secretariat to work closely with Member States, other Regional Institutions and Development Partners to document Best Practices on PPPs in the region.

- **Initiative for development of PPP Guidelines and Hand Book**

133. The Secretariat presented the Concept and Terms of Reference for the development of PPP Guidelines and Hand Book for the Member States.

134. …/… The TOR were extensively deliberated upon and adopted with amendments.

…/…

Recommendations

The Committee recommended that the time frame for study should be increased from 4 man-months to at least 6 man-months given the scope of the study. This

will enable the consultant to do extensive consultations and data collection from all the six Member States
It was further recommended that the Secretariat should plan two Technical consultation Workshops with the Consultant during the study for ownership of the Guidelines…./…
In order to achieve detailed work the following Experts were recommended: an Engineer; a Transport Economist; a Project Finance/ PPP Expert and a Legal/Institutional Development Expert.
The study Consultant is to undertake a review of the failures of the existing PPP projects so as to provide the team with appropriate guidelines for the region
…/…

- **Private sector Strategic Plan Actions 2012-2020 and the annual Work Plan 2013/2014**

Recommendations
The Committee adopted the program objectives aimed at promoting the Private Sector plan that included:

i. *Providing an enabling policy and legal framework for the promotion of private sector participation in the provision of infrastructure facilities and services.*
ii. *Implementing the Northern corridor Spatial Development Programme, including marketing the anchor projects identified in the NCSDP Scoping Study and Infrastructure Master Plan.*
iii. *Coordinating marketing of the sub-region*
iv. *Establishing a macro-economic and investment environment that is fully supportive of private sector participation and the Mobilization of funding for anchor projects.*

We understand that the recommendations adopted by the decision Organs of the NC TTCA, accepting the results of successive studies and the work of the mentioned Committees, establishes rules that must be kept in mind during the development of the RSS Project.

We therefore look at a mandate structuring the Project under preferably a PPP regime and our work is to determine the most appropriate mode and the conditions that make this possible.

According to the information that we have there is certain progress of the Private Sector Investment Promotion Committee works, especially with regards to the development of skills in PPP project structuring and procurement as well as best practices and common guidelines on PPP, with a view of harmonizing PPP policy and legal frameworks. Therefore, in order to start the Project it will be necessary to establish a new special unit, under the General Permanent Secretariat, with the role of unifying criteria and coordinating the different Lots.

Although we know about the existing structures at NCTTCA (Infrastructure Management; Private Sector Promotion) and that should remain as such and accommodate the project management units, we think that it is essential the existence of a single operational unit (that can integrate part or all the existing

structures) due to the request of the possible financers of the project in terms of clearly determine the responsibilities of the project development.

On regional level NCTTCA relevant organs should oversee the Project at policy level.

A steering committee/group comprising representatives of key regional partners and national taskforces have to steer the project. We think that this steering group already has included representatives of the national Task Forces.

A programme coordination unit or project management team within the NCTTCA Secretariat should provide day-to-day support and facilitation of programme implementation at regional level. We think that this unit is formed by the Project Sponsor and the Project Team.

Composition, knowledge and skills and roles of this unit are described in paragraph 4.9.

Taking into account that:
"Each member country will be responsible for the implementation of the projects included into the Northern Corridor infrastructure master plan that are located within its territory. However, NCTTCA has a role to play in this, especially for Level 1 projects. For this reason, it is necessary to develop a set of indicators and a Monitoring and Evaluation Framework to guide the member countries in the project cycle and to provide NCTTCA with the information and the procedures it needs in order to follow and support the implementation of the projects."
(From "The Northern Corridor Infrastructure Master Plan (May 2011)

to facilitate connection and communication with national structures should be created at **National Level,** in the different Countries a **Task force steering Unit** (comprising Private and Public Sector Representatives as well as PPP Units representatives). This should be a Focal Unit preferably within the Ministry of Transport and/or Infrastructure.

Finally, for each RSS at **RSS Level** an **Steering body** or a type of local management structure comprising representatives of key players at local level to oversee project implementation and at a later stage the running of the RSS would supervise the Project/RSS manager's technical and management teams.

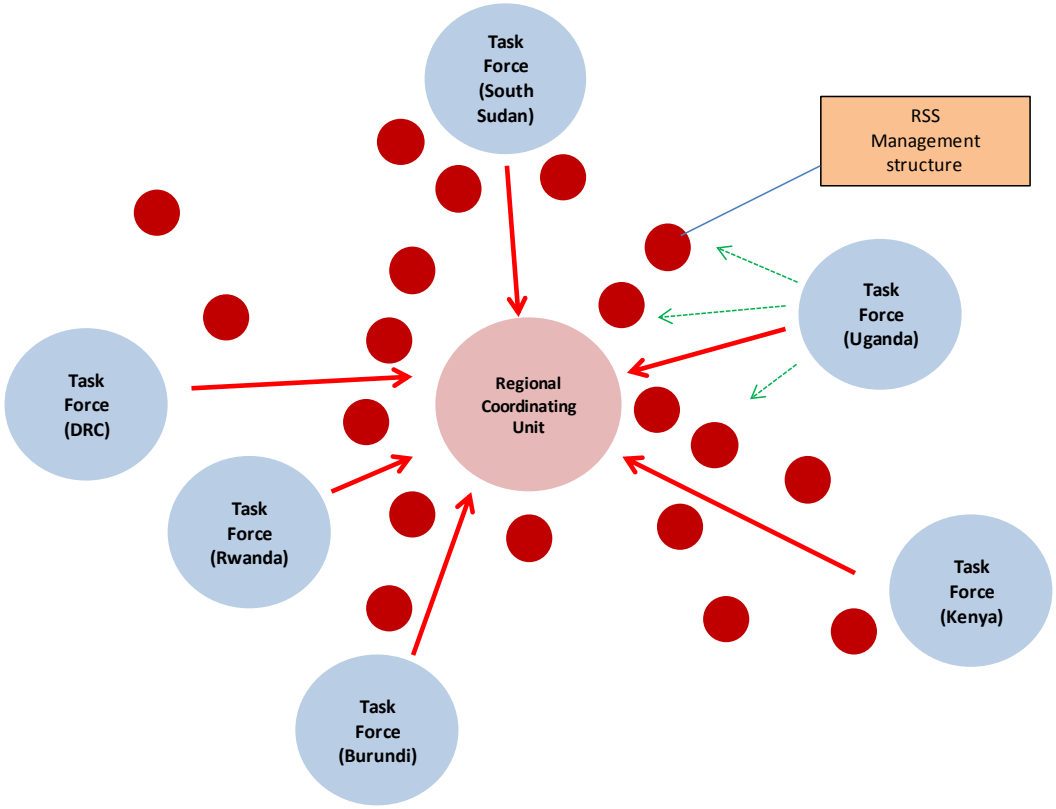


Figure: Framework of proposed institutional entities and dependencies:

5.4. EVALUATION OF INVESTMENT PROJECTS

The different phases for the completion of a Project or to offer a service, from the initial idea through to actual development, are normally outlined as follows:

- The need for a new project or service is established
- The relevant feasibility studies are completed
- The most appropriate type of contract is determined
- The tender documentation is prepared and candidates are invited to bid
- The concession or service delivery contract is awarded and signed
- The contract is managed.

A key to success is to be aware that the Administration and the Concessionaire are partners and share a common goal, which is to provide the services under contract. Therefore, the Administration, which is responsible for monitoring and ensuring that the Concessionaire complies with the standards specified in the contract, should facilitate compliance with the obligations of both parties and promote ways of understanding the issues that inevitably arise in a long-term contract.

5.4.1. ESTIMATING THE NEED TO ADDRESS AN INVESTMENT PROJECT

Pre-investment study

During the preparation and evaluation stages of a Project, or during the pre-investment analysis phase, market research, technical, environmental, economic and financial studies must be undertaken.

a) Feasibility Study

In order to complete this study, it is essential to include the participation of specialists as well as having primary information available (including reasonable quotes for equipment, civil works, licenses, financing, etc.). Technical aspects of the project must be defined such as: location, size, technology, implementation schedule and start date.

The analysis of the organization to be created for the implementation of an income generating project, should consider the size of the physical work, the business and financial capacity of the investor, as well as the technical and administrative level that the operation requires, and the sources and terms for financing.

The feasibility report is the culmination of the project's development, and forms the basis for the decision regarding the project's completion. The report helps those promoting the project, the financial institutions, those responsible for global, regional and sectoral economic implementation.

Project Evaluation Criteria

The evaluation of a project, which compares cost and revenue flows, determines whether a project should be undertaken. That is to say, whether or not the project is profitable, or whether it would be better to delay the start.

The second category, however, corresponds to a social group that includes all economic agents. The assessment framed by the interests of the community is called the social evaluation of projects.

Social Evaluation or Cost-Benefit

The social evaluation of projects seeks to measure the real contribution projects make to the country's economic growth. This information, therefore, must be taken into account by the decision makers in order to programme the investments so that they have the greatest impact on national product.

The essential difference between social evaluation and private evaluation is that for the former, market prices, which determine income and costs, do not necessarily measure benefits nor social costs adequately.

Private /economic-financial Evaluation

Private evaluation compares the flow of income and the costs relating exclusively to a Project and for this the flows are determined using market prices.

Net revenue figures must be updated at some point, usually the year a project commences, by using the relevant discount rate in order to calculate the Net Present Value. In addition, these same figures will be used to calculate the Internal Rate of Return.

5.4.2. COMPLETION OF FEASIBILITY STUDIES

One of the main questions that should be addressed during a project's development process is to determine, as far as possible, the technical, social, economic and financial feasibility of the project.

Technical and Functional feasibility

To briefly, but clearly and distinctly, identify infrastructure, it may be useful to start by describing its functions which must be consistent with the investment objectives.

Analysis of demand

Estimating existing demand and forecasting future demand is a complex and fundamental task.

Investment and operating costs

The feasibility analysis is also used to calculate the investment costs and the expenses that the renewal operations and heavy maintenance (which will be carried out at regular intervals) will incur throughout the evaluation period.

Operating and routine maintenance costs must also be identified and quantified.

Environmental analysis

Current regulations in all countries usually require that an environmental impact assessment must be completed for the majority of transport investments especially for the construction of new infrastructure.

Social feasibility

The social analysis evaluates the project's contribution to the economic well-being of the region or country in question. This Cost-Benefit Analysis (CBA) is undertaken from the point of view of society as a whole (region or country) and not from the point of view of

the infrastructure owner or concessionaire as is the case for the economic-financial analysis.

5.4.3. ECONOMIC-FINANCIAL FEASIBILITY

The following information is obtained from a market study and a technical study: projected income, the investment calendar and the variable cost structure. The operational study and the project organization provide the information regarding fixed costs.

It is essential that any presentation of a Project study contains a specific section on financial analysis.

In addition, the chosen source of funding must be proven to be a realistic alternative and the possibilities for appeal must be shown to be related to the actual characteristics of the project.

Economic feasibility

a) Building a cash flow

Before undertaking a new investment, an operating and business model must be built, which identifies the key variables and makes future projections for them.

b) Economic feasibility and financial feasibility

The crucial element in the economic and financial study is determining whether the Net Present Value (NPV) expected from the study is going to be positive or not, and if the Internal Rate of Return (IRR) is greater than the financial resources available to the project.

Variables such as interest rates, inflation, political factors, amounts as well as input and output prices must all be analysed in order to assess their influence.

Financial Feasibility

a) Financing possibilities

The resources for the financing of an investment Project can come from the following sources:

- Internal Financing: through retained earnings from previous years, through depreciations, asset liquidation, etc.
- External financing: long term debt, short term bank loans, share issues (capital increases)

b) Capital and Equity Cash Flows

The next step in the economic evaluation is to decide whether or not there is any added value to the project and whether it is global (without distinguishing who owns that created value).

However, the financial evaluation must include the equity cash flow corresponding to those who provide the company resources. In this case, the effects of funding must be included in the company cash flow.

c) Cash Flow Debt

The net funds made available to the creditors.

Interests as well as the different commissions paid to the financial institutions for borrowing are included under Financial Expenses

d) Determining the discount rate.

Investors require a Project profitability that is at least equal to what they could obtain with another similar risk investment.

Thus the Project flows must be updated at a rate that reflects investors' overall costs; this rate is the weighted average cost of capital.

e) Project value calculations

Once all the relevant cash flows and appropriate discount rates for updating have been identified, we can calculate the current value of the cash flows involved.

f) Sensitivity Analysis

The Project sensitivity to changes in key variables and the impact on the responses the model gives to the issues raised must be evaluated. A dynamic evaluation will be completed, estimating the future evolution of the results assuming a reasonable evolution

Application to the RSS Project:

Following the process outlined in the diagram below, which has been applied to the whole Project, up to the present time, we have completed the following steps:

The Project is necessary:

The low-quality or the nonexistence of roadside stations has been detected as crucial in explaining the declining freight transport performance along the Northern Corridor.

Most of the current facilities present problems like:

- Poor sanitary and hygienic conditions.
- Social problems in the neighbourhood surroundings: prostitution, extreme poverty.
- Proliferation of hawker markets along the road, resulting in serious safety problems.
- Poor logistics facilities.
- Insufficient parking areas.
- Low quality facilities for resting, particularly for long-stop stays.
- Lack of adequate facilities for re-fuelling and vehicle repair at the current informal truck and bus stopping areas.
- High congestion at borderlines and check points.

The aim of the Project is to identify and appraise interventions that will facilitate investment in the construction of roadside stations along the Northern Corridor as a way to support cost effective, reliable and safe conveyance of freight and people in East Africa.

The subsequent objectives to be achieved with this project are as follows:

- To enable truckers to stop at appropriate points and with appropriate safe facilities (roadside stations)
- To reduce road accidents and loss of life and goods by reducing the tiredness of truckers
- To improve the safety, health and welfare of the road user
- To provide job opportunities and encourage business from the roadside stations

The Project is feasible

- Technical and functional: As described in the First Interim Report, where a model design with schemes and characteristics for the 67 RSSs was shown.
- Socio-Economic: As was demonstrated in the economical and social evaluation in the First Interim Report
- Financial: Only 25 among the 67 RSS considered are not financially fully sustainable by themselves as can be seen in the Financial Analysis included in this Report. Besides 42 of RSS cases could be considered feasible from a financial perspective: 20 would not need any public support, and 22 RSS should use some partial Public support

Determining the method of contracting

Reminding the objectives of the RSS

The RSS Project aims facilitate investment in the construction of Road Side Stations as a way to support cost effective, reliable and safe conveyance of freight and people along the Northern Corridor in order to enhance road safety and health. Other benefits include better health, safety and security for communities along the NC.

The mandate and objectives of TTCA-NC spelt out in the TTCA-NC Agreement are:

- To facilitate trade, the movement of persons, vehicles and goods in domestic and international transport
- To stimulate economic and social development in the territories of the contracting parties
- To transform the Corridor into a Development Corridor which, in addition to offering safe, fast and competitive transport and transit services that secure regional trade, will stimulate investments, encourage sustainable development and poverty reduction

In this context, a key objective is the promotion and implementation of RSSs along the NC.

Instead a large number of investments have been made in improving infrastructure in the NC major existing problems persist with non-physical barriers to trade, including inefficient customs procedures and transit facilities, low competitiveness, lack of infrastructure facilities and frequent internet breakdowns together with poor logistic facilities.

This substantially increases costs to producers, exporters and importers and causes significant delays which seriously affect the competitiveness of key sectors especially industry and agriculture

In conjunction with these problems, the lack of adequate facilities for rest and recovery, for maintenance, for parking and sanitation have had a very serious effect on drivers using the Corridor and has resulted in a very high incidence of HIV/AIDS, the prevalence of prostitution and exposure to robbery and corruption. Road accidents have also been a problem due the lack of rest stops and congestion and queuing at the major Border Cross Points.

There is therefore a concentrated effort to rectify this situation by providing multi-functional RSS to address these problems

Additionally, three main effects can be expected from the establishment of the RSS along the Northern Corridor: First, drivers will be able to take breaks at suitable intervals, contributing to traffic safety; Second, different RSS will be better coordinated with each other, improving convenience for the user. In addition to sharing design concepts, multiple RSS locations can win the trust of users more easily by maintaining a certain level of quality with regard to sales facilities, goods for sale, restroom facilities, lodging facilities and other services. And third, this can be useful in forging an identity for the Northern Corridor as a thoroughfare, improving name recognition, and contributing to the creation of new cultural elements. These goals can be achieved by taking steps such as the adoption of a uniform symbol for all RSS locations built along the route.

5.4.4. ADVANTAGES OF FAVORING LOCAL COMMUNITIES.

In 2008, the World Bank conducted a study on certain types of RSS, called Michinoeki, where the prevailing aim of these RSS was to serve as a tool for development and solving social problems of local Communities.

A Michinoeki combines highway rest area facilities with business services from local communities (eg. The sale of local products) and public services aimed at road users as well as local communities (sanitation, health care including HIV/AIDS care, education and training and cultural activities). Michinoeki exhibit the following three major differences from other types of private roadside facilities, highway rest areas, and service areas located along toll highways in many countries:

- *In addition to providing commercial services through market functions, Michinoeki are also venues for the provision of public services such as sanitation, health care (including HIV/AIDS care), education and training and cultural activities*
- *Local residents can become Michinoeki users, in addition to drivers and travelers*
- *Unlike with expressway service areas, opportunities to participate as service providers are open to local business and community groups. Therefore, local residents have opportunities to increase their income, entrepreneurial efforts and business expertise while concurrently benefiting from a Michinoeki which is contingently supported with financial, institutional, and tax contributions from public institutions.*

Because of these differences, the planning and operation of Michinoeki are conducted through a different process than that used in planning and operation of highways. In particular, Michinoeki require through study with regard to reaching agreement with stakeholders, forming cooperative relationships, assigning responsibilities, and developing an administrative organization.

Most Michinoeki functions are not fulfilled by facilities alone; instead, ongoing activities are needed for the functions to be realized. Because the Michinoeki provide both public and commercial services, a third sector organization based on a public-private partnership is recommended for running operations.

Methods for operation vary among Michinoeki, even in the same country, and there is no universal rule. However the most important elements in the operation phase are to maintain the motivation of local residents operating the Michinoeki to provide better services and maintain a strong public-private partnership.

In the case of a developing country, one possible scenario is for a development organization to serve as the prime mover during identification, with the central government taking over as prime mover during preparation, appraisal, and construction. The development aid organization could continue to offer support during the latter stages as well. Finally, for operations, a third sector organization based on a public-private partnership could take the role of the prime mover.

Within the planning and development process of a Michinoeki, the following recommendations are highlighted:

- *Consider local residents the main actors in Michinoeki*
- *Identify and resolve conflicts of interest before the appraisal stage*
- *Carefully plan consultation steps with stakeholders*
- *Form an organization operating under a public-private partnership for Michinoeki operation*
- *Design the Michinoeki plan from the view point of service supply*
- *Identify sources of funding for construction*
- *Identify sources of funding and in-kind support for operation*
- *Set up monetary and non-monetary indicators in consultation with stakeholders. Include negative impacts in the analysis, especially conflicts of interest. Share results of the impact analysis with stakeholders*
- *Form a sustainable operational framework using a public-private partnership*
- *Operate Michinoeki on the basis of appropriate responsibility sharing*
- *Devise creational measures to ensure sustainable improvement of the services*
- *Maintain the motivation of local residents*

Our work has taken into account the above considerations as an important complement to the work of planning, having considered the views of local communities as

stakeholders. However, the technical and functional aspects of service to the road users have been maintained as a priority.

5.5. THE DEVELOPMENT PHASES

We distinguish three phases in the development of the RSS Project: Take off Phase, Construction and Operation.

The *Take Off Phase*, which is where we are, includes contract the procurement of the RSS, once determined the type of contract or for each RSS or group of them. It will be necessary for it the preparation of tender documentation, which is not included in this contract.

There is public involvement at this stage, since TMEA is acting as prime mover, having contracted this Consultant for the present study.

As we recommended in it, the public role should pass to TTCA-NC when it comes time of contracting. TTCA-NC must hold the monitoring and control functions of the Construction and Operation phases

As we have said several times throughout this work, there is a strong determination, shown in all the decision-making bodies' meetings of TTCA-NC, to promote private sector participation in the development of NC and, in that sense; steps to facilitate its entry and encourage such participation have been adopted.

Besides the reasons that support the convenience of participation of Private Sector such as provide financial resources, know-how and management skills, expertise in areas of construction, "Project Management", operation, risk management, which involves actual cost savings by increasing the efficiency and effectiveness, it must keep in mind the most fundamental aspect that makes this possible: the necessary economic return from the resources provided by the Private Sector.

5.6. RECOMMENDED MODES OF CONTRACTING

At this point the following contracting modalities may be considered:

a). A Private Company finances, builds and operates the RSS (or a group of them).

The Private Company can contract third parties for the construction and certain specific operations in the Operation Phase:

a.1. Specialized Companies

a.2. Third Sector

b). A Private Company partially finances (with certain financial contribution from the Government), builds and operates the RSS (or a group of them).

The Private Company can contract third parties for the construction and certain specific operations in the Operation Phase

c). Government builds (through a Contractor) the RSS (or a group of them) and contract the Operation.

c.1. A Private Company, which can contract third parties for certain specific operations

c.2. Third Sector

The Third Sector is composed of

- *Community-based groups*
- *Self-help groups*
- *Cooperatives*
- *Local Authority*
- *Chamber of commerce*
- *Private Companies based in the environment*

d). A Local Community finances, builds and operate the RSS (or a group of them)

Possible involvement of Local Communities as direct Concession Companies may dramatically limit the obtaining of external funding.

However, they may have an active role, as third sector, active in several businesses linked to the RSS, as mentioned in modalities a), b), and c).

There is also the possibility of having presence in the Steering Group that is described in this report.

An aspect, perhaps the most important, which can determine the success of the implementation of the RSS project is Operation. Management is the key to sustaining and developing a RSS.

If the facility were operated by the Public Sector management could be indifferent to the determination of users´ needs; there would be problems of bureaucracy; and rapid decision-making would be impossible.

Conversely, if the RSS were operated by the Private Sector, a small number of stakeholders would be involved; the benefits would not reach the local community; and a burden might be placed on users in relation to the provision of services.

Selecting an operating entity is extremely important and local community should participate in the decision-making process for choosing the operating entity.

Involving the Third Sector as stakeholder could be difficult due to lack of capacity. Nevertheless the Third Sector could be in charge of operating permanent facilities such as the market and restaurant.

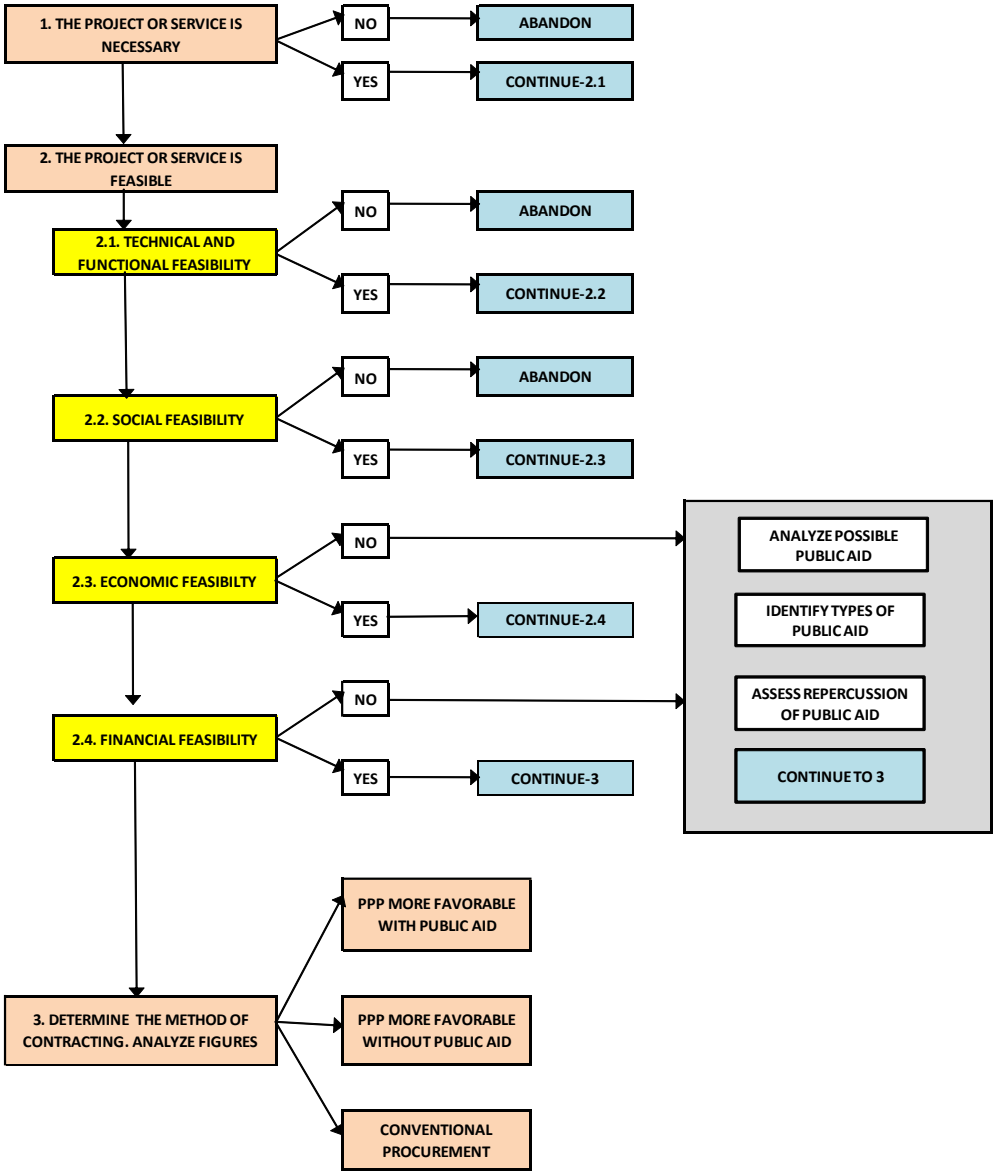
Services that investors cannot provide, such as medical services, policy, etc could be leased on annual basis.

In any case the operating costs need to be covered by revenues from utility charges on the services provided by the different facilities implemented in the RSS.

The structure within the NC TTCA that we recommend will have, among others, the function of monitoring the progress and performance of the Private provider's work.

In the Operation Phase, the Project Team must ensure compliance with the specifications set for standard services to be provided, once the appropriate

performance measures and monitoring systems to determine the performance of the contracted Private Company are determined.



5.7. PERFORMANCE REQUIREMENTS

Contract management by Performance Requirements is essential in the management of public services, public-private partnerships and medium and long term contracts, where the goal is to achieve a standard quality of service and optimizing resources, while keeping the infrastructure value.

Efficient management is to address properly and with minimal resources facilities management in a manner that there is no accelerated deterioration which repair would

mean higher costs and also negatively affect the users causing higher costs and more insecure operation

Implementation of Performance Requirements to manage the facilities is aimed to:

- Assess the quality of service delivered by the integral management.
- Assess factors affecting the evolution of the condition of the infrastructure, both functionally (meeting user needs) and structural.
- Determine the functional suitability and the structural capacity for the uses and solicitations required

Obtaining information on the performance and condition of elements that allows obtaining the values of the Performance Requirements or evaluation parameters can be done through audits, surveys or inspections, auscultations, either a visual way or objective systems, and may be occasional or regular.

Performance Requirements to be used can be classified into: Condition Requirements which indicate the ability of the infrastructure and Operational Requirements.

Performance Requirements can be:

Objectives, such as:

- Structural, based on parameters related to structural condition
- Functional, from values related to the functionality characteristics required for the element
- Operational, measuring quality of service provided

Subjective functional or from users, which reflect the ability of the infrastructure to suit user expectations. Its aim is to assess the opinion of the users-

The choice of Performance Requirements and the procedures for its implementation shall appear on the Terms of Reference of the bidding as well as the penalties for non-compliances.

In the following table appears, as an example, a provisional list of Performance Requirements that may be used in the control of the Concessionaire

	SERVICES	AVAILABILITY		OPERATIONAL STATUS		OPERATIONAL CONDITION					
						CLEANLINESS		SAFETY AND SECURITY		PERFORMANCE	
		YES	NOT	FAIR	BAD	FAIR	BAD	FAIR	BAD	INDICATORS	
1	Petrol Station										
2	Shops										
3	Toilets										
4	Restaurant										
5	Health Clinic										
6	Car Workshop										
7	Truck Services (Repair)										
8	Cleaning Trucks and Cars										
9	Supermarket										
10	Hotel										
11	Bank										
12	Police Check Point										
13	Security Services										
14	Truck Parking										Pavement
15	Minibuses Parking										Lighting
16	Large Buses Parking										Markers
17	Passengers Car Parking										Others
18	Pedestrian and Green Areas										
19	Green Areas										
20	Bureau Office										
21	Public Information Areas/ Administrative Offices										
22	Bar										

5.8. CAPABILITIES THE ADMINISTRATION MUST HAVE.

PPP being a long-term service purchase contract can be more complex than most Government procurement projects. Public agencies and potential private sector providers need to address several issues, such as crafting and understanding, output/outcome specification, preparing whole lifecycle costing, structure a viable and realistic payment mechanism, ensuring fair termination rights, etc.

For the success of the PPP project, it is important to have a strong project management team within the public sector agency to oversee the implementation of the project. This team should have competencies in the financial, legal and technical aspects of contracting through PPP.

Responsibility of PPP project Team

The public sector team is responsible for:

- Evaluating whether it is feasible to structure a PPP model for the project
- Structuring the PPP tender that delivers best value for the Government while providing sufficient business opportunities for the private sector
- Evaluating the tender proposals to select the best provider for the PPP contract
- Preparing the final PPP contract document after the preferred bidder has been selected
- Monitoring the progress and performance of the private provider's work

The public sector PPP project team should be made up of public officers who understand the policy objectives and service requirements for the project. If the public officers involved in the PPP project are not familiar with the financial, legal or technical aspects of the project, private sector PPP advisors can be engaged to provide the necessary expertise to design a viable PPP deal.

Structure of public sector Management Team

Generally, the project management team will involve:

- A Steering Group or Board, which will consist of key decision makers, such as General Secretariat, Chief Executive Officers, and/or other seniors managers of the agency
- A Project Sponsor, who is also member of the Steering Group/Board
- A Project Manager and the project team, which will include in-house staff and specialist external advisors on financial, legal and technical aspects

Competencies needed in the Project Management Team

- Financial Expertise: To identify the best sources of financing for the project
- Legal Expertise: To prepare a fair PPP contract
- Technical Expertise: To clearly specify the output/outcome specifications for the services to be provided under the PPP contract

Key factors in the effective Project Management

- Clear decision-maker and decision-making process
- Continued involvement and support from the project Sponsor
- Regular communications among the project team
- Sufficient stakeholder support
- Affordable project to the public agency
- PPP can deliver value for the Governments
- Sufficient competition for the PPP project from the private sector.

Difficulties due to the lack of legislation and law dispersion in the different countries

As shown in the work of the various committees and recommended by experts contracted, Legal, Regulatory and Institutional structures need to be in place so that they can attract experienced private sector partners who are qualified technically and financially to undertake the Project.

Having similar legal and regulatory structures in NCTTA member countries, or more generally at the EAC or COMESA levels, will provide a more attractive regional environment for experienced companies with backgrounds in implementing successful PPP projects. This would also increase the probability of achieving the desired outcomes or goals of the project.

Within the Strategic Plan 2012-2016 and in its SO1 task appears as a target: To provide an enabling policy and legal framework for the promotion of private sector participation in the provision of infrastructure facilities and services.

There is an awareness of the problem and its solution is underway, having set the period 2012-2014 to achieve the targeted outputs: A common policy and legal framework for investment promotion, Common policy framework, Guidelines for establishment of PPP

units, PPP units established in all members States, Document on best practices and training workshop on PPP.

In this regard the East African Chamber of Commerce, Industry and Agriculture (EACCIA) set up the PPP Project Advisory Unit Network (PPP PAUN).

The PPP PAUN is centred on a "lead PAU", with six "National PAUs" (Kenya, Uganda, Tanzania, Zanzibar, Burundi y Rwanda) housed at private sector organizations in each EAC member State.

The Lead PAU is responsible for identifying and generating areas of interest, and providing organizational capacity not available in the other private organizations.

The core services and functions of the PPP PAUN are:

- *A web site (hosted by the Lead PAU) containing information such as:*
- *PPP manuals and guidance*
- *Case studies and good practice examples*
- *Infrastructure status and notifications of tenders*
- *Links to partners and other sources of useful information*
- *An on line community of practice (CoP), with discussion forums, event notifications, training materials and other resources*
- *Practical training and workshops, covering issues such as local firm engagement as subcontractors in large PPPs*
- *Facilitation of PPP participation amongst SMEs (Small and Medium Enterprises), either through subcontracting in large PPPs or through increased micro-PPP projects*
- *Identification and capture of good PPP models*
- *Stimulation of demand and interest amongst PAU members, national governments and municipalities across the region.*

In addition, the National PAUs:

- *Act as counterparts to government PPP units to enhance public-private dialogue on PPPs*
- *Provide a mechanism for sharing of knowledge and experience across the region*
- *Provide a conduit for the private sector to propose innovative approaches to government at all levels to enhance the effectiveness of PPP infrastructure projects in East Africa*
- *Facilitate greater regional cooperation and collaboration*
- *Identify funding for events and training programmes*

The PPP PAUN will provide de dual benefit of accelerating infrastructure development in the region and providing greater opportunities for local private sector business.

A conference was held in Mombasa, Kenya on 9th and 10th August 2012 to launch the PPP PAUN.

The event, which was attended by representatives of key private and public institutions involved in PPPs, allowed the participants to exchange views on a wide range of issues associated with PPP projects for infrastructure development.

The results of a regional study on the PPP enabling environment were presented and updated with new information on most recent developments. There was a strong consensus on the need to ensure consistency across the region in the legislative and institutional framework for PPPs, both to avoid creating barriers to participation by the local private sector and to facilitate large, transnational projects such as the major transportation corridors

At the moment, both the content of the web as the functions described are in a very preliminary phase and we do not believe that they are useful for our project in the immediate term.

On the contrary, it is of greater interest and better implementation to our Project RSS the imminent contracting by the NC TTA of a Consultant for Preparation of Guidelines and Hand Book. (Terms of Reference October 2013)

The reasons for this contract confirm what is expressed in our present work, since:

Successful implementation of the Northern Corridor SDI Programme will require enhanced private sector participation through Public Private Partnerships in backbone transport infrastructure projects outlined in the Northern Corridor Infrastructure Master Plan and other Northern Corridor anchor projects that create linkages with transport. At the moment however, there is lack of necessary legal frameworks for PPPs in Northern Corridor countries. While some countries have made effort to develop PPP policies and to put in place the necessary legal framework, majority of the countries have not made any progress. In any case, there will be need to harmonize the policies and legal frameworks to enhance the NC SDI implementation.

The main objectives of the Study are to:

- *Review ongoing PPP initiatives in the Transport Sector and other interdependent Sectors including, Energy, Mining and Inland Water Ways.*
- *Review existing Policy and Legal Frameworks, Institutional set ups for PPPs in Member States of NCTTCA*
- *Review Existing PPP capacity and knowledge gaps*
- *Develop the user guidelines and Hand Book for PPPs Projects.*
- *Develop Action Plan and Strategy for Development of Capacity for PPP among Member Countries*

The tasks to be carried out by the consultant under this study will include but not limited to the following:

- *Compile data on the ongoing PPP Projects and initiatives including Regulatory and Legal framework Status in NCTTCA Member States (Kenya, Uganda, Rwanda, Burundi, DR. Congo and South Sudan)*

- *Undertake an in-depth analysis of existing PPP deals and undertakings in Member States in key target sectors of Transport and Infrastructure, Energy ,Mining and inland water ways*
- *Identify capacity gaps and challenges being faced in managing the projects and other capacity needs for advocacy and enhancement;*
- *Undertake a review of the current challenges and constraints of the existing PPP projects being implemented in Member Countries so as to inform the formulation of appropriate guidelines for the region.*
- *Compile candidate PPP pipeline projects and initiatives in the key sectors of Transport Infrastructure, Energy, Mining including inland water ways in all Member Countries of Northern Corridor. The Consultant is expected to visit each member state of NCTTCA.*
- *Based on the analysis above, design a guidelines and produce a user hand book for advocacy and awareness creation that would improve the management of PPP deals. The Manual should include key thematic areas but not limited to such as PPP Preparation and Contracting Options, Planning for PPP Projects and Deals Risk Identification, Mitigation, and Allocation Programming Procurement and Contract Monitoring Institutional Requirements to Structure Bankable PPP Projects, PPP Transaction Advisory Services, Institutional requirements and Technical Capacity requirements for PPP.*

According to the Proposed Procurement Schedule of the Terms of Reference, the signature of the contract is scheduled for November 20, 2013 and the date for the Submission of Final Report by Consultant is March 30, 2014

The existence of related documentation and its application to the RSS will facilitate the project implementation.

5.9. RECOMMENDED ORGANIZATION

The advantages of a coordinating Entity (within the NCTTA and dependent on the General Secretary).

We can conclude from the above that the RSS Project has been accepted by the NC TTCA decision-makers, as necessary and desirable for all the member countries.

We can also assure that its implementation will probably be within NC TTCA responsibilities and that it is the Organization's consolidated intention that the Private Sector should significantly participate in the Project development.

Until the policy and legal framework unification processes are consolidated within the 5-year strategic Plan 2012-2016, under the auspices of the General Secretary, it would be possible to promote some of the Lots in those countries that already have an appropriate legal framework and some experience in PPP project development, such as Kenya and Uganda. In the remaining Member States the establishment of a Legal framework is being worked on.

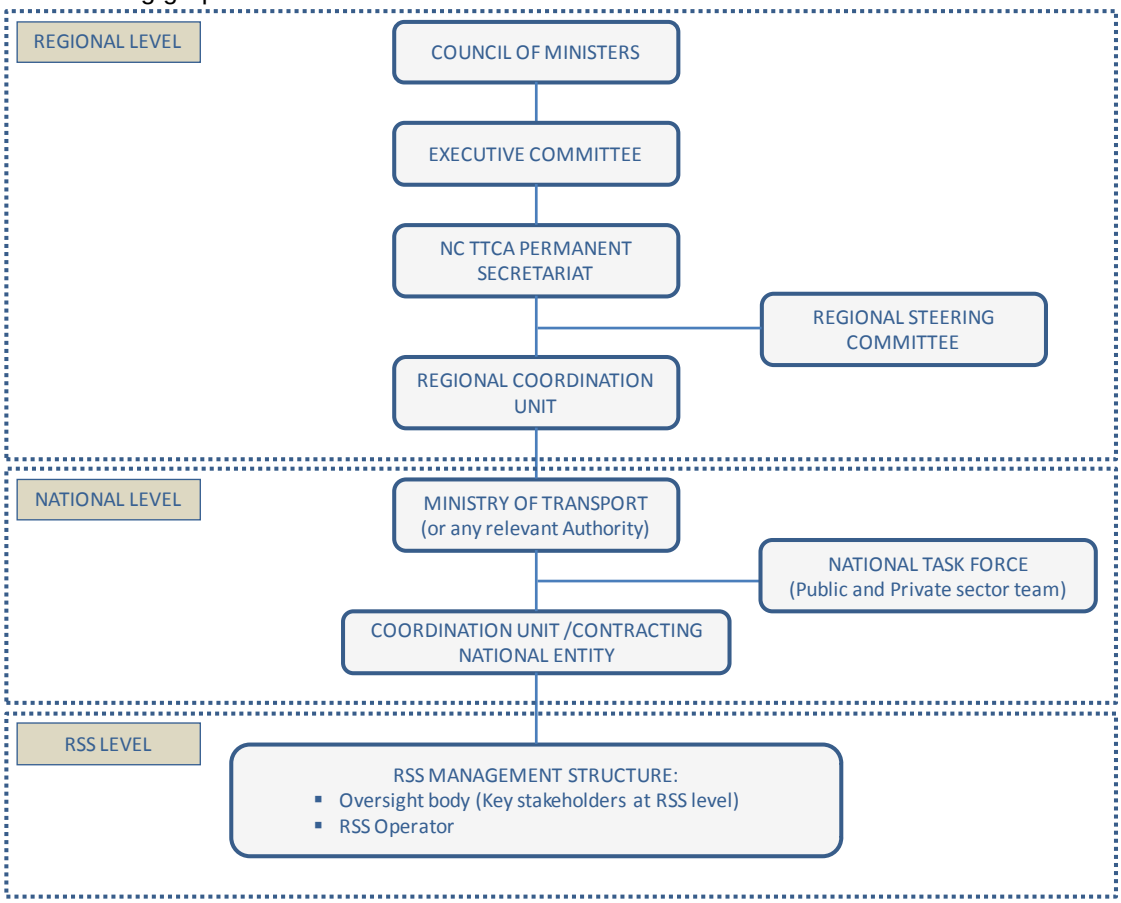
Notwithstanding the above, and taking into account the desirability of a unified approach to the institutional aspects as well as functional aspects of the different RSS (which will

be a key task for the National Task forces), we believe that the following staff, reporting directly to the General Secretary, should be involved right from Project kick-off.

They could be referred to as the "Coordinating Unit for RSS Implementation and Management", and could include part of the existing structures such as Infrastructure Management and Private Sector Promotion.

The existence of such a Unit, even where some of the RSS implementation procedures are started before having a common policy and legal framework, will help to coordinate the different tasks. It will also be the custodian of the experiences acquired and will focus the process development expertise during the different phases: tender, procurement, construction and operation. The Project Team members can change, depending on the phase of development of the Project.

The following graph shows the recommended structure:



The oversight, steering and management of RSSs should take advantage of the existing institutional frameworks both at regional and national levels. Implementation frameworks have been proposed as follows:

- At regional level: A steering committee and a coordination unit within the NCTTCA

- At national level: A Task Force including representatives from public and private sector and a coordination unit in the Ministry or other public agency in charge of transport and road safety
- At local/RSS level: A Management Structure, which may comprise an oversight body bringing together key stakeholders at RSS level and RSS operator's management/operation structure

Describe the functions and attributes (Recommendations in the IMP)

The functions of the Steering Group must be similar to those of the Executive Committee of the Authority, obviously adapted to the implementation of the Project in hand. The category of their members will help to underline the Organization's and of the Member Countries involvement in the success of the Project. The following stand out among these functions:

- Election of the Project Sponsor
- Appoint of the Project Manager and Internal staff
- Appoint External Advisors
- Approval of the Terms of Reference for Proposals
- Approval of the Proposed Allocation of Lots
- Approval of the Final Contracts
- Knowledge and approval of the follow-up reports submitted by the Project Sponsor

The Project Sponsor is the link between the Steering Group and the Project Team, as well as the coordinator with the National Taskforces steering Units.

The Project Team, led by the Project Manager, shall have the responsibilities described above and which are detailed below:

- Evaluating whether it is feasible to structure a PPP model for the project
- Structuring the PPP tender that delivers best value for the Government while providing sufficient business opportunities for the private sector
- Evaluating the tender proposals to select the best provider for the PPP contract
- Preparing the final PPP contract document after the preferred bidder has been selected
- Monitoring the progress and performance of the private provider's work

The Project Team should have competencies to structure and evaluate the (i) financial (ii) legal and (iii) technical aspects of the deal.

These specialists should be able to:

(i) Financial:

- Build up a robust business case
- Identify the responsibilities and risks borne by the public sector

- Prepare and revue tender proposals
- Identify the financial implications of the contract clauses in the contract

(ii) Legal:

- Structure and draft tender documents, the PPP contract and land lease agreements
- Provide general legal advice on taxation, property, planning, environmental law, banking, competition law

(iii) Technical:

- Defining output/outcome specifications and service standards for the services to be provided
- Technical evaluation of proposals and bids
- Quality assurance during construction phase
- Developing appropriate performance measures and monitoring systems to determine the performance of the private sector provider.

Until such Financial, Legal and Technical expertise is not available inside the Secretariat´s Organization, the use of external experts is strongly recommended.

In addition, it will also have an important coordinating role for the different Lots, Collection of the experiences obtained and advising public managers of each Lot.

Contracting Lots by countries. (From "The Northern Corridor Infrastructure Master Plan (May 2011)

Each member country will be responsible for the implementation of the projects included into the Northern Corridor infrastructure master plan that are located within its territory. However, NCTTCA has a role to play in this, especially for Level 1 projects. For this reason, it is necessary to develop a set of indicators and a Monitoring and Evaluation Framework to guide the member countries in the project cycle and to provide NCTTCA with the information and the procedures it needs in order to follow and support the implementation of the projects.

The different functions and responsibilities of the National Units, as well as the Project Teams of each RSS will be those defined in the National Laws.

The interface between these Units and Project Teams with the proposed structure (Steering Group and Project Sponsor) must be determined very clearly in protocols. These protocols will be required by the financers of the Project.

There are areas where National Laws will need to be aligned and harmonized to enable successful implementation of the RSS programme. These areas are:

- Concessions Laws and PPP Laws
- Repatriation of Capital Laws
- Environmental Laws
- Cross Border an clearance procedures Laws

- Land ownership Laws
- Health, Safe and Security Laws

The agreements that will need to be signed by various parties and will govern the conduct of business within RSSs are.

- At each RSS level, there will be a standard charter that will bind all participating stakeholders to specific roles and responsibilities. The charter will also set the required standard for the services, which will be provided within the RSS
- At regional level, the NCTTCA will develop a model charter, which will guide the negotiation and signing of such charters at local level across the Northern Corridor.

6. RISK/THREAT EVALUATION AND MITIGATION STRATEGIES

The objective of this chapter is to identify the main risks and threats based on the most relevant assumptions of the project which may arise during its future development. Likewise, the main mitigation measures for each risk are outlined.

We have followed a well-defined path, after the financial analysis and market studies described above, with the aim of structuring the "bankability" of the project. The outcome is seen as being adequate to attract investors and financiers into putting up the development funds.

A full understanding of who takes what risk and the general rules applied by project financiers can result in remarkably good project finance agreements. Matching these objectives to the structures in a project financing is heavily driven by the specific risk to be covered and the balance sheet and tax objectives of the sponsors.

6.1. THE CONCEPT OF RISK

Risk is the damage potential that can arise from a hazard, or in other words: risk is the product of the cost of a hazardous event and its probability of occurrence.

Project risks arise from a variety of factors including:

1. Natural conditions
2. The way the design of the project was optimized to accommodate natural conditions
3. The arrangement of the contracts under which the project was implemented
4. Financial matters such as credit worthiness of the executing agency.

6.2. PHASES OF DEVELOPMENT AND DIFFERENT CAUSES OF RISKS

A comprehensive programme of evaluation and management of the principal types of risk is proposed which could improve the quality of the decisions made. The programme would cover site investigation, design optimization, contingency in cost estimates, contractual arrangements and would evaluate the political risk, the financial arrangements and the standing of the prospective contracting parties.

During the lifetime of the project, costs pass through three phases: the take-off phase, the construction phase, and the operation phase. Although the most significant risk periods are the construction and the operation phases, for this particular case we consider that the take off phase will be critical, particularly for political reasons. Most of them can be considered a Political Risk.

Construction risk is derived from the probability of the contract being completed on time, within budget and in accordance with design specifications set out in the contracts;

Operating risk is derived from the availability of the RSS and their ability to perform the services with the quantity and quality specified.

The meaning and consequences of the most significant risks are detailed below:

Market Risk occurs when:

- the sales price falls;

- market share drops;
- demand for a Project reduces/ceases;
- Sales are lost due to the deteriorating quality of the project's facilities,

This is one of the most critical areas for risk absorption by the financiers. This key risk in project financing is the most difficult to cover and usually has the weakest support overall within the project's total risks.

Political risk is derived from actions or measures taken unexpectedly by the Governments which cause injury to a private contractor. This figure includes among others, the risk of restrictions being imposed on currency conversions and / or the transfer of financial resources abroad, the expropriation of property affected by the contract or the Governments making substantial changes to the regulatory framework which result in changes to the presupposed conditions for contractor activities, as well as changes to taxation

Legal risk. The burden of legal documentation usually rests on the financier and their advisers. There is some risk that professional advisers will create risks in the document which can affect the tax position, tenure, security, enforcement and other attributes so heavily negotiated in the risk-sharing process and embodied in the project financing in the first place. Second opinions, judgements, and experienced staff and advisers are perhaps the only way to mitigate this final risk category.

Environmental risk is derived from the probability of time or costs overrunning caused by the environmental effects of a particular RSS;

Risk of expropriation is derived from the availability of land for the construction of works on time and within budget;

Financial risk, is derived from potential changes in market conditions, such as

Lack of liquidity, and/or:

Foreign exchange risk, is derived from the probability of variations occurring in the project cost and revenue flows (i.e., when they are denominated in different currencies) and

Rate risk, i.e. the risk derived from the likelihood of ongoing problems in making adjustments aimed at maintaining tariff structures that were initially projected and which if they occur involve significant changes to the prescribed conditions.

Force Majeure risk, i.e., the probability of certain unforeseen events occurring that could result in partial or total destruction of infrastructure and / or cessation of activities (eg, fires, earthquakes, floods, prolonged droughts, strikes, riots, etc.).

6.3. RISK ANALISYS

To carry out our analysis we distinguish two stages:

- Risk identification and its possible impact statement, by estimating the likelihood of occurrence.
- Risk management including mitigation and allocation

As for the probability of occurrence and the importance of their impact on costs and project timelines, we will classify both cases using four grades: very low (VL), low (L), medium (M) and high (H).

6.4. RISK IDENTIFICATION

From the Project development process transcribed below, we have identified the risks and threats inherent in each activity, establishing the key factors and the potential consequences. We have also qualified the likelihood of them occurring, and the impact on cost and time.

Project Development Process. Activities/Risks:

1. Project Approval
    - 1.1. Number and location of the RSS
    - 1.2. Lots to contract
    - 1.3. Priorities
    - 1.4. Financial Feasibility
2. Road Show
    - 2.1. Presentation to Developers
    - 2.2. Evaluation of the Interested Parties
3. Form of Contracting
    - 3.1. Terms of Reference
    - 3.2. Tendering and Awarding
    - 3.3. Contracting
    - 3.4. Financial Closing
4. Construction Phase
    - 4.1. Ground Risk
    - 4.2. Technological Risks
    - 4.3. Human (Social) Risks
    - 4.4. Environmental Risks
    - 4.5. Legal and Regulatory Risks
    - 4.6. Political Risks
    - 4.7. Financial Risks
    - 4.8. Force Majeure
5. Operation Phase
    - 5.1. Outsourcing of Functions and Services
    - 5.2. Hiring Staff

5.3. Project Performance

5.4. Environmental Risks

5.5. Legal and Regulatory Risks

5.6. Political Risks

5.7. Financial Risks

5.8. Force Majeure

6.5. RISK MANAGEMENT

From a conceptual standpoint, there is a direct proportional relationship between risk and profitability, because the greater the risk, the greater the benefit demanded by contractors. This means that in order for private investors to take greater risks (even though they may undertake mitigation measures such as taking out insurance); they will demand much higher levels of profitability, which implies an unnecessary higher cost of the project.

Appropriate distribution of risk is therefore essential to reduce project costs and ensure their successful implementation. By contrast, inadequate distribution could jeopardize their financial viability or hinder their efficient management and raise the costs of construction and services provided.

Once a risk has been identified and quantified, it is important to define the responsibilities for indemnifying the risk consequences. This must be accomplished by suitable clauses in the contract agreements between the parties involved. Should the risk occur, the party carrying the risk must have the financial capability to guarantee continued existence and adequate financing during the period of liability.

A full understanding of who takes what risk and the general rules applied by project financiers can result in remarkably good project finance agreements. Matching these objectives to the structures in project financing is heavily driven by the specific risk to be covered and the balance sheet and tax objectives of the sponsors. Depending on the Contracts used, certain risks will be transmitted to the Contractors, which is in fact a mitigation measure.

There are various contractual liabilities to transfer the financial consequences of a troublesome event, such as indemnities, sureties, bonds, guarantees and insurances.

6.6. THE RISKS MATRIX

As a result of the analysis and conclusions, we have elaborated a Risk Matrix, which summarises the risks, potential consequences, key factors, likelihood of occurrence, their effects on costs and time, our recommendation for allocation and possible mitigation measures. *The allocation will depend on the chosen development mode.*

In the Risk Matrix, in addition to our recommendations of which risk each party must support, we also outline possible mitigation measures.

By adopting the mitigation measures identified and recommended in the Risk Matrix, we can then focus on the risks that will remain wholly or partly in the Public Party.

According to the ratings of likelihood of occurrence and impact on costs and deadlines established in the Risk matrix, we focus on those with medium (M) or high (H) probability or impact, and which would affect the Government.

Finally, **sensitivity analysis** is completed for those types of risks with higher probability of occurrence and major impact incidence on TTCA-NC.

The risk matrix proposed is enclosed.

		INCIDENCE				
POTENTIAL CONSEQUENCES	PROBABILITY	COSTS	TIME	RISK ALLOCATION	INSURANCE OPTION	MITIGATION
Delays				NC TTCA	No	
	L	M	M			Meetings with Stakeholders
	L	L	L			Diligence in the processing
	L	M	M			Meetings with Stakeholders
	L	L	M			Diligence in the processing
						Diligence in the processing
	M	H	M			To get approval from the Governments
There are no interested Parties	M	M	M	Consultant	No	Complete the Legal Framework
There are no interested Parties	M	M	M	Consultant		Modify the Terms of Reference
				NC TTCA/ Consultant		
Delays	M	VL	M	NC TTCA	No	Accelerate work of the Committee of PPPs
	M	VL	L	NC TTCA		Accelerate work of the Committee of PPPs
	M	L	M	NC TTCA		Provide to the General Secretariat the required structure
Delays	L	VL	L	NC TTCA	No	Diligence in the processing
	L	VL	L			Modify the Terms of Reference
Delays	L	VL	L	NC TTCA	No	Diligence in the processing
	M	L	M	NC TTCA		Provide to the General Secretariat the required structure
Project cancellation	M	L	M	Concessionary	No	Make Due Diligences 1.4 and 2.2.

POTENTIAL CONSEQUENCES	PROBABILITY	INCIDENCE		RISK ALLOCATION	INSURANCE OPTION	MITIGATION
		COSTS	TIME			
Increasing Costs and Delays						
	VL	VL	VL	NC TTCA/Contractor	No	Adequate level of site investigation. Equitable
	VL	L	L	NC TTCA/Contractor	No	contract "bill of quantities" based. Provide
	VL	VL	VL	Insurance Policies	Yes	adequate contingengy allowances.
Costs and time overruns						
	VL	VL	VL	Contractor	No	Choose a capable and experienced contractor with
	VL	VL	VL	Contractor	No	good reputation.
	VL	VL	VL	NC TTCA/Contractor	Partially	Appropriate clauses in the contract
Delays	L	L	L	Contractor	No	
Delays	L	L	L	Contractor	Partially	Expert Contractor . To include strikes and riots as
Delays and Renegotiating Conditio	VL	VL	VL	NC TTCA/Contractor		Force Majeure in Insurance policies
Increasing Costs and Delays	VL	VL	VL	NC TTCA/Contractor	Yes	Conduct environmental impact statement and
Delays	VL	VL	VL	NC TTCA/Contractor	No	obtain permits before bidding
Delays and Renegotiating Conditio	L	VL	VL	NC TTCA	No	
Delays and Renegotiating Conditio	VL	VL	VL	NC TTCA	No	Obtaining permits and right of way and execute
Delays and Renegotiating Conditio	VL	VL	VL	NC TTCA	No	resettlement before bidding
Delays	L	L	L	NC TTCA	No	
Renegotiating conditions	VL	L	VL	NC TTCA	Partially	
Renegotiating conditions	VL	L	VL	NC TTCA/Contractor	No	Appropiate clauses in construction contract
Delays	VL	VL	VL	NC TTCA	No	Appropiate clauses in construction contract.
Delays	L	L	L	NC TTCA	No	Provide adequate contingency allowances
Renegotiating conditions	L	L	L	NC TTCA	No	
	VL	M	M	NC TTCA		
						Appropiate clauses in the construction contract.Provide a sovereign guarantee to maintain the exchange rate. Convertibility of local currency
Increasing Costs	M	M	VL	NC TTCA	Partially	must be guarantied by Government
Delays and Renegotiating Conditio	L	L	VL	NC TTCA/Contractor	No	
Increasing Costs	M	M	VL	NC TTCA/Contractor	Partially	
Increasing Costs	M	M	VL	NC TTCA/Contractor	No	
Infeasibility	L	M	VL	NC TTCA		
Delays and Renegotiating Conditio	L	VL	VL		No	Reject reckless bids. Choose a capable and
						experienced contractor. Establish appropriate bonds and securities
Costs and time overruns	VL	VL	VL	NC TTCA/Contractor	Yes	
						Define rigorously cases of Force Majeure. Execute adequate Insurance Policies with a reputable company

		INCIDENCE				
POTENTIAL CONSEQUENCES	PROBABILITY	COSTS	TIME	RISK ALLOCATION	INSURANCE OPTION	MITIGATION
				Concessionaire	No	
	VL	L	VL			
	VL	L	VL			Choose capable and experienced Operator with good reputation.Training local Labor Force in management and operation practice
Losses	L	L	VL			
	L	L	VL			
	VL	L	VL			
Delays	L	VL	L	Concessionaire	No	Training local Labor Force in operation practice
Costs and time overruns	M	L	VL	Concessionaire	No	Choose capable and experienced Operator with good reputation.Establish clear and measurable Indicators. Establish appropiate bond and securities
Costs overruns	L	L	L	Concessionaire	Partially	Appropiate clauses in operation contract.
Delays and Renegotiating Condition	VL	VL	VL	NC TTCA	No	Obtaining permits before operation period
Renegotiating conditions	VL	L	VL	NC TTCA	Partially	Appropiate clauses in operation contract
Renegotiating conditions	VL	VL	VL	NC TTCA	No	
Renegotiating conditions	L	L	L	NC TTCA	No	Appropiate clauses in operation contract
	L	M	M	NC TTCA	No	
Losses and possible Default	M	NONE	NONE	Concessionaire	Partially	Require a dedicated debt service reserve fund.
Costs overruns	M	M	VL	NC TTCA/ Concessionaire	No	
Costs overruns	M	M	VL	NC TTCA/ Concessionaire	Partially	Appropiate clauses in the operation contract.
Costs overruns	M	M	VL	NC TTCA	Partially	Convertibility of local currency must be guarantied
Infeasibility	L	M	VL	NC TTCA	No	by Government
Costs and time overruns	VL	L	VL	NC TTCA/ Concessionaire	Yes	Define rigorously cases of Force Majeure. Execute adequate Insurance Policies with a reputable company

7. STRATEGIES FOR THE FINANCING AND THE IMPLEMENTATION OF THE PROJECT

7.1. SCOPE OF THE WORKS

This block will focus on the **financial analysis** of the RSS network program, and more precisely on the specific financial outcomes of each and every pre-selected RSS, depending on several key assumptions and variables.

More specifically, the objectives of this block of activities are:

a. To prepare a **financial model** that will permit the activities foreseen in RSS programme to be simulated, and therefore helping in the decision taking for evaluating the potential attraction of the project with regard to possible concessionaires in a bidding competition.

b. To obtain the **financial profitability indicators** for every RSS, along with the level of potential **solvency** and ***bankability*** (according to *project financing* schemes) and/or needs for public under a case by case basis.

Hence, in the following pages we will start by describing the key assumptions adopted for the financial modelling stages of the RSS Programme, as well as the main results obtained. These assumptions are obviously based, in a larger extent, on the availability of relevant data on the different categories analyzed (technical, traffic, financial..).

We have to recall that, in line with the aims of ToR for this RSS study, we are proposing an approach for the analysis based on a Private financing[18] framework (but which can be of course compatible with some sorts of supports by Multi-lateral financing, if needed)

7.2. TECHNICAL / OPERATIONAL ASSUMPTIONS ADOPTED

7.2.1. PERIOD CONSIDERED FOR THE FINANCIAL ANALYSIS

The time horizon considered for the evaluation of the project concession (a period which is common for all RSS) is 22 years: 2015 – 2036 among which it has to be considered the following:

- Initial investments period: a 2 years period (2015 – 2016) for initial investments, among which the net investments period is only 18 months: last six months on second year can be considered as already operational for business.
- Full operations period: 20 years (2017 – 2036) are considered for project operations. Last year (2036) is considered to be really operational only at 50% for concession removal considerations
- Hence, the project time schedule considered is:
  - Initial investments between 2015 and 2016 (18 months)
  - Full operation between 2017 and 2036.
- Timing of investments disbursements: as a general rule we have considered that investments can be implemented at a 65% level on first year, and 35% on second

[18] That approach could be considered as opposite to the concept of soft loan financing by means of a direct Government based financing

year. This assumption could be modified if necessary for the entire network and also on a case by case scenario.

7.2.2. CAPITAL COSTS REQUIRED.

The estimation for capital expenses (CAPEX) for each RSS is derived from the demand estimated for each RSS and ratio application from *Michinoeki World Bank guidelines.* The calculations are included in the First Interim Report.

- Investments key elements considered are:
  - Parking area
  - Pedestrian and gardening
  - Buildings
  - Land
  - Others
- Useful life of assets / amortization criteria. We have considered that all project assets are fully depreciated during the operational period. It should be noted that first / last year of business period are only operational at 50% (as explained above) and amortization quotas are accordingly scheduled to this operational characteristic
- Interest during construction: From basic initial investment estimates (CAPEX), the financial modeling must also take into account the financing costs incurred during the construction phase. Therefore *interests during construction* (IDC[19]) must also be included as a part of fixed assets and, hence, must be financed. As a matter of illustration we show below the case of Nakuru RSS (all data are in US$) in which we can see that interest during two first years must be financed[20].

[19] the most relevant component of IDC are pre - operational interest costs from senior debt

[20] that is, included in the assets to be financed

PROJECT OPERATIONS & CASH FLOW			2015 Year 1	2016 Year 2
inflation rate	4,5%		1	2
Cost increase index			*1,045*	*1,092*
Tariffs increase index			*1,045*	*1,092*
Execution period (months)			*12*	*6*
Operations period			*0*	*6*
capital subsidy	0%			
investments in first year:		65,00%		
Initial Investment cost		**Total**	**1.094.193**	**647.598**
Parking		382.475	248.609	133.866
Pedestrian and gardening		53.350	34.677	18.672
Building		822.694	534.751	287.943
others		183.734	119.427	64.307
land		197.354	128.280	69.074
interest rate:		8,00%		
Interest during construction			28.449	73.736
grace period	2			
repayment period	12			

7.2.3. REVENUES AND OPERATING EXPENSES

Our analysis started with the compilation of our own estimations[21] for preliminary dimensioning of each and every pre-selected RSS. This means that the following proposed inputs are quite significantly based on our own findings during field trips but also on the availability of data.

That dimensioning process led to further estimations for both *core project revenues* and *operational costs.* Again, we contrasted all of our data and ratios with the World Bank ***Michinoeki*** **guidelines**.

All data in the financial model are in US$

For operational assumptions we have estimated a general and common framework for all RSS in terms of expenses and revenues, and also taking into account our knowledge of specific economic activities in East Africa. But we have customized every set of proposed revenues and costs to each RSS case.

- For the assumptions concerning operating and maintenance costs (personnel, energy..), in all RSS cases we have used the following general costs structure:

Maintenance and operating costs	
Personnel (Secretariat for market and restaurant) ($)	**6,520**
Security guard/parking attendant (three persons) ($)	**7,042**
Repairs ($/m^2 building)	**1.165**
Public utilities ($/m^2 building)	**9.896**
Others	**10% 1-4**

[21] Derived from field works during the first journey Mombasa – Bujumbura, buts also from further journeys, including South Sudan, north of Uganda, etc.

- Assumptions on revenue structure for the project
  - We have studied the possible typologies of services which can be offered to be included in a typical RSS. But, obviously, not all types of services have been proposed to all RSS[22]. The types of project core revenue proposed analyzed are:
    - Restaurants
    - Shops
    - Banks
    - Workshops (cars / minibuses)
    - Cleaning vehicles
    - Hotels
    - Petrol stations
    - Services to trucks / buses
    - Supermarkets
    - Health clinics
    - Public spaces
  - **Scenarios for projections**: we have dimensioned all services / activities in a RSS according to an agreed steady state estimation of demand. That level is not the current level of demand observed from field trip. All RSS have therefore been dimensioned so as not to be collapsed from the start of operations. This has led to an important increase in RSS programme CAPEX from previous estimations.
  - **Income from RSS revenues** is based -- given the operational structure of all RSS -- from a set of tariffs or rentals for every considered activity (in RSS premises) in terms of US$ / m^2. ➔ Therefore, a given RSS will get income from proposed spaces (m^2) of any specific activity on RSS premises, but at the same time that space (m^2) has been estimated according to:
    - the general demand (users / day) of every RSS case, and
    - the specific demand estimated for every activity proposed in any RSS case
  - The set of tariffs (US$ / m^2) has been first estimated according to TYPSA's knowledge on rental price ranges in East Africa (Kenya, Uganda..). But we have also tested our tariffs proposal according to our knowledge about the different business margins and conditions of the activities proposed[23]. We are showing in the below table the adopted set of range of tariffs computed, according to the intensity of use of the different business activities by road users.

[22] It should be noted that weighbridges activities inside RSS premises have not been considered in the analysis, according to several comments during September 2013 PIT meeting.

[23] For instance, petrol stations concessions do not usually pay more than 1% of annual income to land owners. By contrast, restaurants and hotels can afford around 5% - 10% of annual income, etc

Table. Proposed tariffs by activities (nominal prices 2014)

	TARIFFS SCHEDULE (US$ / m2) BY DEMAND ON SERVICE		
	LOW	MEDIUM	HIGH SERVICE
RESTAURANTS	0,462	2,154	5,538
SHOPS	0,224	1,077	2,746
BANKS	0,462	2,154	5,538
WORKSHOP CARS / MINIBUSES	0,897	4,308	10,985
CLEANING VEHICLES	0,075	0,359	0,915
HOTEL	0,045	0,215	0,549
PETROL STATIONS	4,487	21,538	54,923
SERVICES TO TRUCKS & BUSES	1,346	6,462	16,477
SUPERMARKET	0,056	0,269	0,687
HEALTH CLINICS	0,224	1,077	2,746
PUBLIC SPACES	0,200	0,200	0,200

- Criteria for indexing of prices and costs: prices (tariffs) and costs have been escalated according to a tariff / cost increase Index based on the inflation rate adopted in the financial model for the project time horizon: 4,5% (annual)

7.3. FINANCIAL MODELLING

7.3.1. OPERATING CASH FLOWS OF THE PROJECT

For the purposes of drawing up the financial model, our estimations on revenues, costs and investments (with accounting[24] criteria) are transformed to values with a criterion of effective **cash inflows and outflows**.

The operating aspects of the project have been modelled via project EBITDA[25] estimation, and we have then obtained for every RSS case the ***project free cash flows***[26] which are the key indicators to evaluate the global (un-levered) financial feasibility of the project[27]: **Project Internal Rate of Return (IRR)**

Project IRR is based on *free cash flows* projection and constitutes the preliminary step for further modelling of the **financial structure of the project**, which will provide the **shareholder or Equity IRR** (profitability of the levered project), which is the measure of the effective return for the promoters of the project under a concessionaire company.

7.3.2. KEY INPUTS ADOPTED

- Assumptions on *financial hurdle rate*:

[24] accrual

[25] Earnings Before Interests, Taxes, Depreciation and Amortization.

[26] Operating cash flows independent of the financial structure adopted for the project

[27] As we will see, we have also estimated the different additional financial cash flows in any financial appraisal, mainly, shareholder (equity) cash flows and debt cash flows. This part is related with the idea of PPP packaging and gives an estimate on the financial (levered) analysis and bankability elements of RSS programme.

The estimated hurdle rate or WACC[28] rate for every RSS is **8.19%,** based on different technical assumptions (derived from CAPM[29]) such as:

- Financial gearing adopted: 65% / 35% (debt / equity)
- Corporate taxation data: 20%
- Risk free rate: around 6%
- Cost of debt: 8% (reference + 200 bb.pp)
- Proxy of probable financial equity returns (Ke): 11.5%

All these assumption are fully flexible in the model in order to evaluate different financial scenarios on a case by case basis, if necessary.

WACC PARAMETERS	
Capital	35,00%
Ref. Rate	6,00%
Premium	5,50%
Beta	1,000
Costs of Capital	11,50%
Debt	65,00%
Interest Rate	8,00%
Taxes	20,00%
WACC	**8,19%**

- Assumptions on operational funding needs (working capital)
  - Operational cash needed: 2% of revenues
  - Clients: 2% of revenues
  - Stocks: 2% of revenues
  - Providers: 3% of revenues
  - ➔ operational investments (change in working capital needs): 3% of revenues

==> Increase in WC	
(change in W.C as % of op income)	*3%*
(Working Capital)	
CC	
Cash needed	*2%*
Clients as %	*2%*
stocks as %	*2%*
Providers as %	*3%*

7.3.3. FINANCING PLAN / BANKABILITY

After having studied the possible (un-levered) cash generation structure of any RSS project, an analysis needs to be made of whether this is sufficient not only for a profitable operation, but

[28] WACC (*Weighted Average Cost of Capital*)

[29] Capital Asset Pricing Model, CAPM

also for a **comfortable compliance with the commitments to repay the main debt, and for contributing to reimbursing the capitals invested by the promoters of the project.**

These effects can be analyzed by means of estimating shareholder profitability, or **Equity (financial) IRR**.

Shareholder financial profitability differs from the **Project (financial) IRR** to the degree that we include financial leverage into the analysis.

Therefore we have built up the model in order to also **simulate a financial structure for the project** and to measure the possibilities of profitability and ***bankability*** for it, aspects that are particularly relevant for structuring a project under the form of a *project finance* modality.

For the determination of a financial structure that is supportable by the project we have based our works on some conditions of capitals markets, such as:

- Cost of financial (*Senior*) debt for the project: 8%. (this can be viewed as a pure market debt or even a weighted average cost (market / institutional debt)
- Grace period: 2 years (construction period)
- Repayment period of Senior Debt: 12 years
- DSCR target for reaching acceptable bankability levels: 1.30 (average first 5 years)[30]

7.4. FINANCIAL OUTCOMES

7.4.1. ESTIMATION OF THE FINANCIAL PROFITABILITY OF THE PROJECT

The global economic financial profitability of the project has been derived from the following financial indicators:

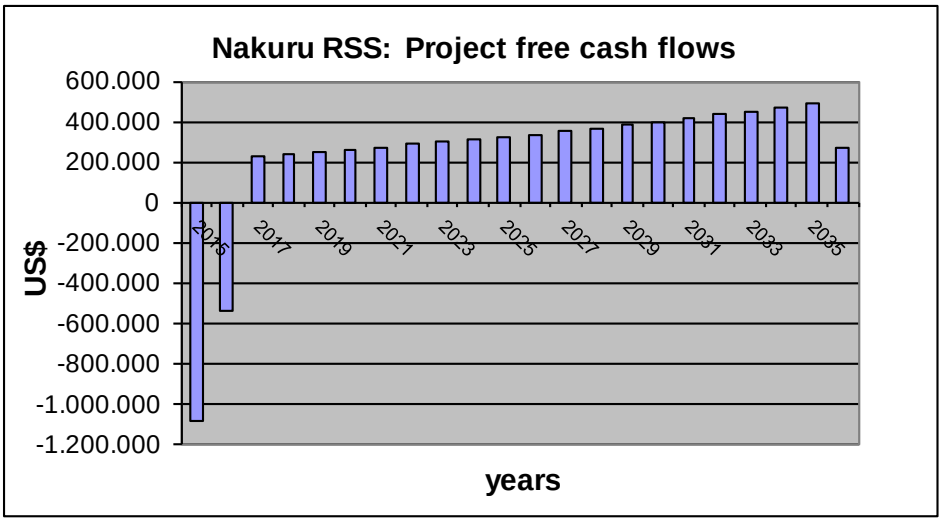
- Project IRR
- Project Net Present Value (NPV)
- Discounted investment recovery period (discounted Pay Back)

We have estimated all financial indicators for all pre-selected RSS. The detailed results of any RSS are shown in a table at the end of the report. For illustrative purposes we are showing the different financial outcomes for a specific (random) case: **Nakuru RSS**

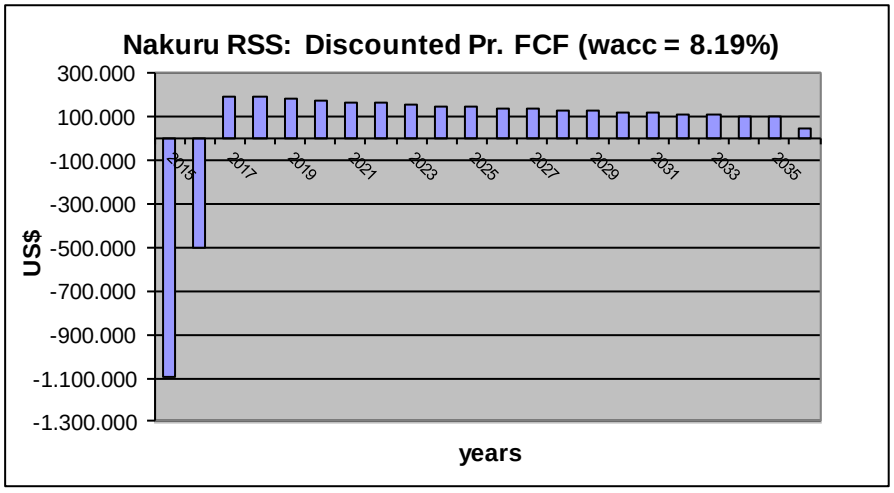
The projection of Nakuru RSS free cash flows is showed below, as well as the projection of the discounted free cash flows, which are the key cash flows to evaluate global financial feasibility

[30] This is a rather subjective issue. DSCR level should be large enough so as to be very confident (on a project finance basis) on the capacity of cash flows to repay easily the debt (principal plus financial expenses) under the agreed contractual conditions (rates, fees, repayment period..). Therefore, based on our experience in project financing and PPP cases in Africa we think that a DSCR of 1.3 could be fairly realistic.

Graphic: free cash flows (FCF)



Graphic: discounted free cash flows



In this case we reach a project IRR of **15.26%** which is by far higher than 8.19% (WACC rate) and therefore indicates a **first intuition on global financial profitability:** regardless of any particular financial structures that should be proposed, Nakuru RSS project **creates a net economic value** to average project funding providers (sponsors, banks..).

Table: financial indicators (Nakuru)

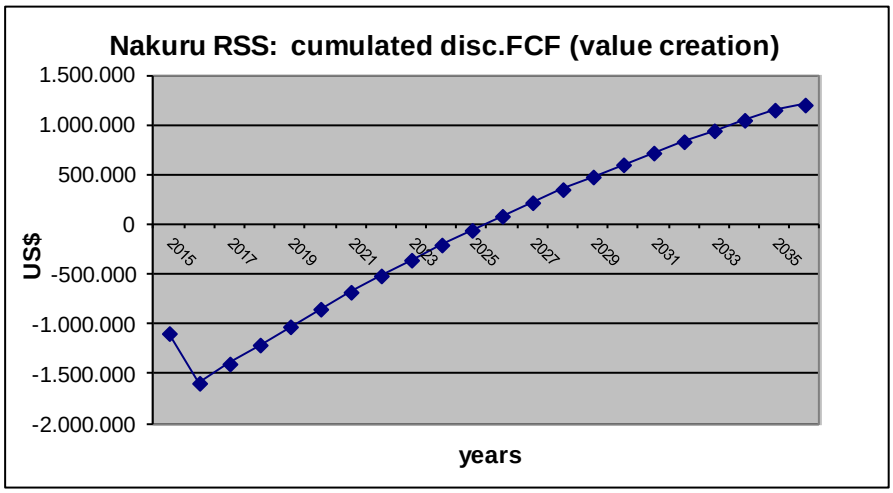
Project IRR (wacc =8.19%):		**15.26%**	
FCF total:		**5,198,556**	**US$**
Project NPV		**1,201,822**	**US$**
Proj. Pay Back	**(years)**	**12**	

That (net) value creation is represented by project NPV. In particular, **Nakuru RSS creates an economic value of 1,201 Mill. US$** (in today terms) above from all costs incurred (NPV = 1,201 Mill. US$).

Besides, the project is actually quite **liquid** since in year 12 all costs incurred have been fully recovered (NPV = 0 at year 12), and from year 13 to year 22 the project creates that extra economic profit of 1,201 Mill. US$

All these project dynamics in value creation can be showed in next figure (cumulated discounted free cash flows)

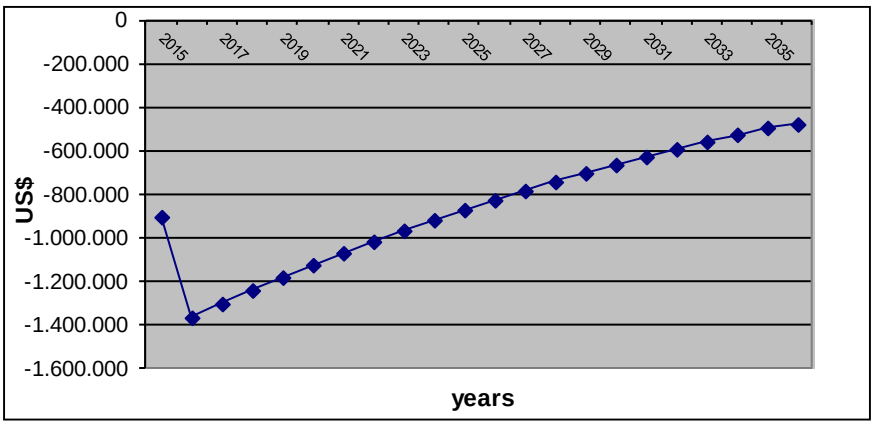
Graphic: Cumulated discounted free cash flows



All these calculations have been done for all pre-selected RSS. Of course, not all cases show that same pattern of financial feasibility.

We have projects in which we have positive free cash flows (EBITDA > 0) showing a positive scheme in operations, but some difficulties at recovering investments. This is the case of, for instance, **Mau Summit RSS.**

Graphic: Cumulated discounted free cash flows (Mau Summit)



In this case, we have:

Table: financial indicators (Mau Summit)

Project IRR:			
wacc=	*8%*	**3.77%**	
FCF total:		**752,132**	**US$**
Project NPV		**-480,014**	**US$**
Proj. Pay Back	**(years)**	**0**	

Project is not financially feasible at first glance, but could be helped by Public support (Government Grants, Multilateral soft loans, etc.) since operations are efficient.

In other cases, we have project characterized by unsustainable operations. In those cases EBITDA is permanently negative and therefore we can't see any economic value creation since project is making financial losses year by year, and not because revenues couldn't recover capital (financial) costs.

We could say that first order condition of financial sustainability is not even reached. This is the case, for instance, of **Naluwerere RSS**. Key data and graphs are showed below.

Graphic: Cumulated discounted free cash flows (Naluwerere)

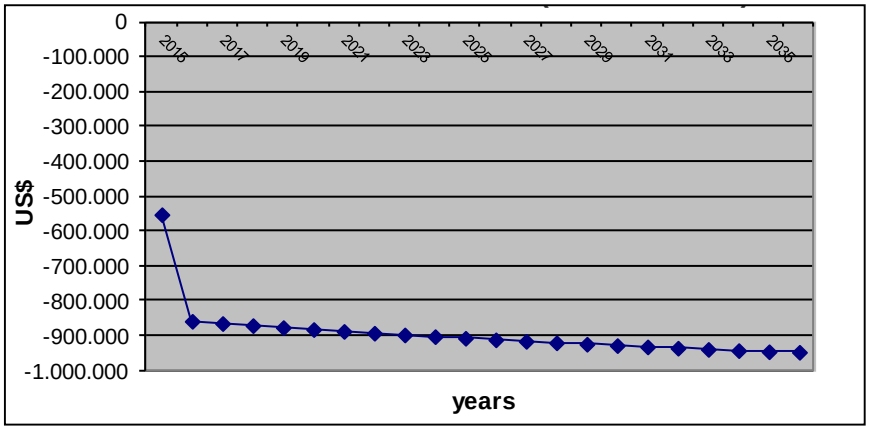


Table: financial indicators (Naluwerere)

Project IRR:	**wacc=**	*8%*	**#¡DIV/0!**	
FCF total:			**-1.101.999**	**€**
Project NPV			**-948.416**	**€**
Proj. Pay Back		**(years)**	**0**	

7.4.2. ESTIMATION OF SHAREHOLDER FINANCIAL PROFITABILITY

In this block we analyze cases in which we are interested in knowing if, given a project already globally financially feasible, the project is also *bankable*, that is, if it can creates extra cash in order to:

- Repay easily the Senior Debt within a pre- agreed schedule

- Remunerate accordingly all Equity investors

Equity financial profitability is estimated by means of the simulation of a *specific financial structure* (debt / capital), a debt programme and the estimation of relevant cash flows for private investors.

As a matter of illustration we hare showing below the financial indicators obtained for the case, again, of **Nakuru** RSS:

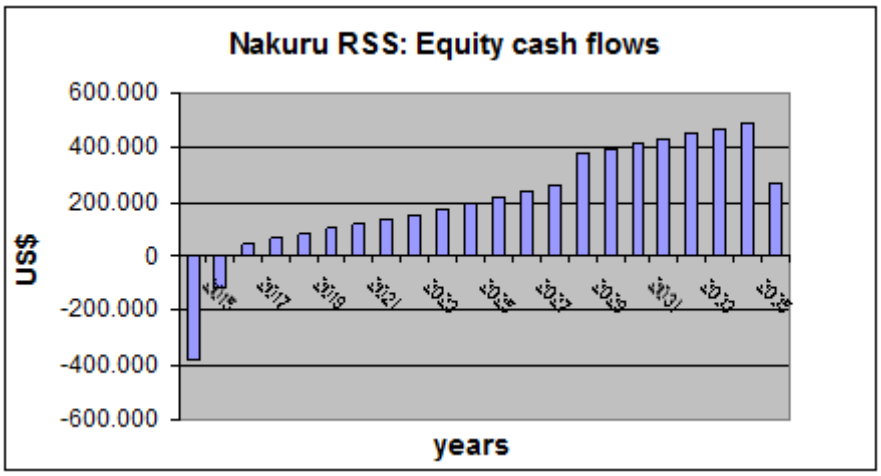
- Equity IRR: 21.82%
- NPV of the public contributions needed: 0 US$
- Bankability: average[31] DSCR (annual debt service coverage ratio: 1.49

Potential private investors in Nakuru RSS project could reach an acceptable profitability since:

Equity IRR = 21.82% > > ke = 11.5%

At the same time, project debt repayments can be very confidently accomplished since average DSCR[32] = 1.49, which indicates that *cash available for debt service* (CADS) is almost 50% higher than required for debt service repayment.

Graph: Equity cash flows (Nakuru)



For illustrative purposes we are showing in next two pages an example (Nakuru) of the main financial projections implemented for each of the 67 RSS cases. The first one is a projection of the core income, costs, operational cash flows, free cash flows and key financial ratios.

The second one shows the modelling of the specific financial structure proposed and how this one fits the project required investments and makes the final structure sustainable.

[31] Average first 5 years of operation

[32] DSCR = Debt Service Coverage Ratio. We are considering here an average of first 5 years of programme repayment horizon

Table: Financial projections for Nakuru RSS. Operations and free cash flows

NAKURU

Road Side Stations Programme 2015 - 2045

phase I (months) 18

phase II (years) 20

PROJECT OPERATIONS & CASH FLOW			2015 Year 1	2016 Year 2	2017 Year 3	2018 Year 4	2019 Year 5	2020 Year 6	2021 Year 7	2022 Year 8	2030 Year 16	2031 Year 17	2032 Year 18	2033 Year 19	2034 Year 20	2035 Year 21	2036 Year 22
Operating revenues			**0**	**150.199**	**313.916**	**328.042**	**342.804**	**358.230**	**374.350**	**391.196**	**556.320**	**581.355**	**607.516**	**634.854**	**663.422**	**693.276**	**362.237**
Handling fees			**0**	**150.199**	**313.916**	**328.042**	**342.804**	**358.230**	**374.350**	**391.196**	**556.320**	**581.355**	**607.516**	**634.854**	**663.422**	**693.276**	**362.237**
Restaurants		4.497	0	29.467	61.585	64.356	67.252	70.279	73.441	76.746	109.141	114.052	119.184	124.548	130.152	136.009	71.065
Shops		549	0	3.599	7.521	7.860	8.213	8.583	8.969	9.373	13.329	13.929	14.556	15.211	15.895	16.610	8.679
Banks / bureau offices		222	0	1.452	3.034	3.170	3.313	3.462	3.618	3.781	5.376	5.618	5.871	6.135	6.411	6.700	3.501
Car / minbueses workshops		769	0	5.038	10.530	11.003	11.499	12.016	12.557	13.122	18.661	19.500	20.378	21.295	22.253	23.254	12.150
Cleaning cars / trucks		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel		165	0	1.080	2.256	2.358	2.464	2.575	2.691	2.812	3.999	4.179	4.367	4.563	4.769	4.983	2.604
Petrosl stations		16.477	0	107.959	225.635	235.788	246.399	257.487	269.074	281.182	399.869	417.863	436.667	456.317	476.852	498.310	260.367
Services to trucks / buses		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Supermarkets		137	0	900	1.880	1.965	2.053	2.146	2.242	2.343	3.332	3.482	3.639	3.803	3.974	4.153	2.170
Health Clinics		108	0	706	1.475	1.541	1.610	1.683	1.759	1.838	2.614	2.731	2.854	2.982	3.117	3.257	1.702
Public spaces		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maintenance cost			**0**	**1.337**	**2.795**	**2.921**	**3.052**	**3.190**	**3.333**	**3.483**	**4.954**	**5.177**	**5.409**	**5.653**	**5.907**	**6.173**	**3.225**
Repairs	a	2.449	0	1.337	2.795	2.921	3.052	3.190	3.333	3.483	4.954	5.177	5.409	5.653	5.907	6.173	3.225
Operating cost			**0**	**20.779**	**43.427**	**45.381**	**47.424**	**49.558**	**51.788**	**54.118**	**76.962**	**80.425**	**84.044**	**87.826**	**91.778**	**95.908**	**50.112**
Personnel	a	6.520	0	3.560	7.440	7.775	8.125	8.491	8.873	9.272	13.186	13.779	14.399	15.047	15.724	16.432	8.586
Security guard	a	7.042	0	3.845	8.036	8.397	8.775	9.170	9.583	10.014	14.241	14.882	15.551	16.251	16.982	17.747	9.273
Public utilities	a	20.811	0	11.363	23.749	24.818	25.935	27.102	28.321	29.596	42.088	43.982	45.961	48.030	50.191	52.449	27.405
Others	a	3.682	0	2.011	4.202	4.391	4.589	4.795	5.011	5.237	7.447	7.782	8.132	8.498	8.880	9.280	4.849
EBITDA			**0**	**129.420**	**270.489**	**282.661**	**295.380**	**308.672**	**322.563**	**337.078**	**479.359**	**500.930**	**523.472**	**547.028**	**571.644**	**597.368**	**312.125**
amortization schedule																	
depreciation			0	-38.611	-77.222	-77.222	-77.222	-77.222	-77.222	-77.222	-77.222	-77.222	-77.222	-77.222	-77.222	-77.222	-38.611
EBIT			0	90.809	193.267	205.439	218.159	231.451	245.341	259.856	402.137	423.708	446.250	469.806	494.423	520.147	273.514
adusted taxes	*20%*		0	-18.162	-38.653	-41.088	-43.632	-46.290	-49.068	-51.971	-80.427	-84.742	-89.250	-93.961	-98.885	-104.029	-54.703
NOPLAT			0	72.648	154.613	164.351	174.527	185.160	196.273	207.885	321.710	338.967	357.000	375.845	395.538	416.117	218.811
amorization			0	38.611	77.222	77.222	77.222	77.222	77.222	77.222	77.222	77.222	77.222	77.222	77.222	77.222	38.611
CAPEX			-1.094.193	-647.598	0	0	0	0	0	0	0	0	0	0	0	0	0
FCF projection			-1.094.193	-540.845	226.924	241.149	251.306	261.920	273.011	284.601	398.213	415.437	433.437	452.247	471.903	492.443	267.353
			-1.094.193	*-499.926*	*193.886*	*190.452*	*183.457*	*176.739*	*170.286*	*164.085*	*122.352*	*117.987*	*113.785*	*109.741*	*105.847*	*102.098*	*51.236*
			-1.094.193	*-1.594.119*	*-1.400.233*	*-1.209.782*	*-1.026.325*	*-849.586*	*-679.300*	*-515.216*	*601.128*	*719.115*	*832.900*	*942.641*	*1.048.488*	*1.150.586*	*1.201.822*
			n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d	16	17	18	19	20	21	22

Project IRR:	**wacc=**	*8,19%*	**15,26%**
FCF total:			**5.198.556 €**
Project NPV			**1.201.822 €**
Proj. Pay Back		**(years)**	**12,0**

Table: Financial projections for Nakuru RSS. Investments and funding

NAKURU

Road Side Stations Programme 2015 - 2045

phase I (months) 18

phase II (years) 20

PROJECT OPERATIONS & CASH FLOW				2015 Year 1	2016 Year 2	2017 Year 3	2018 Year 4	2019 Year 5	2020 Year 6	2021 Year 7	2022 Year 8	2030 Year 16	2031 Year 17	2032 Year 18
inflation rate	4,5%			1	2	3	4	5	6	7	8	16	17	18
Cost increase index				*1,045*	*1,092*	*1,141*	*1,193*	*1,246*	*1,302*	*1,361*	*1,422*	*2,022*	*2,113*	*2,208*
Tariffs increase index				*1,045*	*1,092*	*1,141*	*1,193*	*1,246*	*1,302*	*1,361*	*1,422*	*2,022*	*2,113*	*2,208*
Execution period (months)				*12*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Operations period				*0*	*6*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*
capital subsidy	0%													
investments in first year:		65,00%												
Initial Investment cost		**Total**		**1.094.193**	**647.598**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Parking		382.475		248.609	133.866									
Pedestrian and gardening		53.350		34.677	18.672									
Building		822.694		534.751	287.943									
others		183.734		119.427	64.307									
land		197.354		128.280	69.074									
interest rate:		8,00%												
Interest during construction				28.449	73.736	0	0	0	0	0	0	0	0	0
grace period	2													
repayment period	12													
Project financing														
Share Capital		35,00%		382.968	226.659	0	0	0	0	0	0	0	0	0
EIB loan		0,00%		0	0	0	0	0	0	0	0	0	0	0
Bank Loan		65,00%		711.225	420.939	0	0	0	0	0	0	0	0	0
EU Grant		0,00%		0	0	0	0	0	0	0	0	0	0	0
Annual input				*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Bank Loan														
Loan Balance c/f				711.225	1.132.164	1.132.164	1.037.817	943.470	849.123	754.776	660.429	0	0	0
Loan repayment year 1		94.347		0	0	94.347	94.347	94.347	94.347	94.347	94.347	0	0	0
Interest payments				0	0	90.573	83.025	75.478	67.930	60.382	52.834	0	0	0
End balance			0	711.225	1.132.164	1.037.817	943.470	849.123	754.776	660.429	566.082	0	0	0
Assets depreciation				**0**	**38.611**	**77.222**	**77.222**	**77.222**	**77.222**	**77.222**	**77.222**	**77.222**	**77.222**	**77.222**
Material Assets														
Investment		1.544.437		965.913	578.524	0	0	0	0	0	0	0	0	0
Depreciation		1.544.437		0	38.611	77.222	77.222	77.222	77.222	77.222	77.222	77.222	77.222	77.222

7.4.3. RESULTS FOR ALL RSS CASES

All the financial outcomes, for each and every RSS, are shown on **tables A and B** at the end of this report. With the assumptions adopted we can highlight the following conclusions:

- **20 RSS (29.85%) have a high private financing potential. They seem to be totally feasible from a financial perspective and PPP considerations**: globally financially feasible and bankable, and therefore could be of interest of private investors. They could be proposed to private funding without any need in terms of further Public support (funding, subsidy..).

  RSS cases in this category:

  - **Mackinnon road II**
  - **Voi**
  - **Mtito Andei**
  - **Nakuru**
  - **Salgaa**
  - **Webuye**
  - **Malaba**
  - **Busitema**
  - **Lugazi**
  - **Masaka road**
  - **Mbarara**
  - **Kabale**
  - **Maai Mahiu**
  - **Korinda Junction**
  - **Kumi**
  - **Lira**
  - **Elegu**
  - **Mpondwe**
  - **Beni**
  - **Bunagana**

- **22 RSS (32.84%) have a medium private financing potential. They could be financially feasible with a certain financial support from Public Authorities or Institutional / Multi-lateral funding**. The level of financial support must be analyzed case by case.

  RSS cases are in this category:

  - Miritini
  - Taru
  - Maungu

- Sultan Hamud
- Junction Machakos
- Naivasha
- Mau Summit
- Burnt Forest
- Jua Kali
- Mbiko
- Lukaya
- Lyantonde
- Biharwe
- Ruhango
- Butare
- Kamdini
- Gulu
- Migeera
- Karuma
- Purongo
- Ishaka
- Goma

- **25 RSS (37.31%) have a low private financing potential, since they are not sustainable by themselves from an operational point of view**. Average EBITDA < 0. If projection completion would be a key issue in these cases, Public support would be needed not only to reach financial profitability levels, but basically to cover at least operational expenses.

  RSS Cases are in this category:

  - Manyani
  - Makindu
  - Naluwerere
  - Idudi
  - Buwama
  - Ntungamo
  - Rukomo
  - Nyacyonga
  - Kayanza
  - Bugarama
  - Yala

- Sega Town
- Nimule
- Nasitu
- Pakwach
- Arua
- Oraba
- Mirama Hills
- Ryabega
- Rugende
- Komanda
- Niania
- Kisangani
- Kitabi
- Bukavu

- Main average financial outcomes (67 RSS):
  - Average Project IRR = 11.64% / average Equity IRR = 15.66%
  - Weighted[33] average project IRR = 12.11% / Weighted average Equity IRR = 16.96%

[33] Weights: RSS days users

Table A: summary of key financial indicators for the 67 RSS. Proposed *bankable* RSS

COUNTRY		NAME	Users day	Users	Ke	WACC	NPV	Pr-IRR	Eq-IRR	EBITDA	DSCR	Financial feasibility	Equity profitability	Operation sustainability	Bankability	Proposed RSS
			#	%	%	%	US$	%	%	US$	x					
KENYA	1	MIRITINI	1.384	1,90	11,50%	8,19%	727.376	13,13%	17,65%	316.097	1,29	YES	YES	YES	NO	NO
KENYA	2	TARU	747	1,02	11,50%	8,19%	-419.897	4,26%	2,62%	123.349	0,61	NO	NO	YES	NO	NO
KENYA	3	MACKINNON ROAD II	3.018	4,13	11,50%	8,19%	1.327.491	16,66%	24,72%	404.443	1,63	YES	YES	YES	YES	OK
KENYA	4	MAUNGU	410	0,56	11,50%	8,19%	-189.563	5,84%	5,08%	105.965	0,71	NO	NO	YES	NO	NO
KENYA	5	VOI	2.854	3,91	11,50%	8,19%	1.084.067	13,98%	19,29%	419.894	1,37	YES	YES	YES	YES	OK
KENYA	6	MANYANI	319	0,44	11,50%	8,19%	-979.707	n.a	n.a	-594	-0,01	NO	NO	NO	NO	NO
KENYA	7	MTITO ANDEI	3.180	4,36	11,50%	8,19%	1.257.198	16,41%	24,21%	389.253	1,60	YES	YES	YES	YES	OK
KENYA	8	MAKINDU	197	0,27	11,50%	8,19%	-782.346	n.a	n.a	-6.013	-0,06	NO	NO	NO	NO	NO
KENYA	9	SULTAN HAMUD	512	0,70	11,50%	8,19%	-337.291	5,32%	4,27%	148.443	0,68	NO	NO	YES	NO	NO
KENYA	10	JUNCTION MACHAKOS	896	1,23	11,50%	8,19%	-115.775	7,70%	8,10%	366.625	0,84	NO	NO	YES	NO	NO
KENYA	11	NAIVASHA	861	1,18	11,50%	8,19%	292.825	9,56%	11,21%	370.162	0,98	YES	NO	YES	NO	NO
KENYA	12	NAKURU	3.850	5,27	11,50%	8,19%	1.201.822	15,26%	21,82%	408.674	1,49	YES	YES	YES	YES	OK
KENYA	13	SALGAA	3.670	5,03	11,50%	8,19%	1.084.067	13,98%	19,29%	419.894	1,37	YES	YES	YES	YES	OK
KENYA	14	MAU SUMMIT	579	0,79	11,50%	8,19%	-480.014	3,77%	1,85%	119.961	0,58	NO	NO	YES	NO	NO
KENYA	15	BURNT FOREST	425	0,58	11,50%	8,19%	-444.933	4,37%	2,79%	136.261	0,62	NO	NO	YES	NO	NO
KENYA	16	JUA KALI	744	1,02	11,50%	8,19%	-575.500	2,91%	0,54%	111.877	0,53	NO	NO	YES	NO	NO
KENYA	17	WEBUYE	873	1,20	11,50%	8,19%	1.301.130	20,71%	33,74%	322.726	2,05	YES	YES	YES	YES	OK
KENYA	18	MALABA	901	1,23	11,50%	8,19%	1.165.458	17,45%	26,41%	338.060	1,71	YES	YES	YES	YES	OK
UGANDA	19	BUSITEMA	2.823	3,87	11,50%	8,19%	1.275.083	17,03%	25,52%	378.246	1,67	YES	YES	YES	YES	OK
UGANDA	20	NALUWERERE	234	0,32	11,50%	8,19%	-948.416	n.a	n.a	-10.853	-0,09	NO	NO	NO	NO	NO
UGANDA	21	IDUDI	3.176	4,35	11,50%	8,19%	-938.570	n.a	n.a	-11.871	-0,10	NO	NO	NO	NO	NO
UGANDA	22	MBIKO	601	0,82	11,50%	8,19%	-15.573	7,99%	8,57%	122.416	0,86	NO	NO	YES	NO	NO
UGANDA	23	LUGAZI	3.912	5,36	11,50%	8,19%	1.249.094	15,65%	22,63%	410.456	1,53	YES	YES	YES	YES	OK
UGANDA	24	BUWAMA	139	0,19	11,50%	8,19%	-938.570	n.a	n.a	-11.871	-0,10	NO	NO	NO	NO	NO
UGANDA	25	LUKAYA	547	0,75	11,50%	8,19%	-102.301	6,91%	6,81%	114.333	0,79	NO	NO	YES	NO	NO
UGANDA	26	MASAKA ROAD	6.417	8,79	11,50%	8,19%	1.368.496	15,12%	21,55%	470.583	1,48	YES	YES	YES	YES	OK
UGANDA	27	LYANTONDE	515	0,71	11,50%	8,19%	-4.556	8,12%	8,79%	113.145	0,87	NO	NO	YES	NO	NO
UGANDA	28	MBARARA	3.117	4,27	11,50%	8,19%	1.084.067	13,98%	19,29%	419.894	1,37	YES	YES	YES	YES	OK
UGANDA	29	BIHARWE	412	0,56	11,50%	8,19%	-143.566	6,38%	5,95%	108.205	0,75	NO	NO	YES	NO	NO
UGANDA	30	NTUNGAMO	193	0,26	11,50%	8,19%	-1.292.720	n.a	n.a	-15.593	-0,10	NO	NO	NO	NO	NO
UGANDA	31	KABALE	3.867	5,30	11,50%	8,19%	1.084.067	13,98%	19,29%	419.894	1,37	YES	YES	YES	YES	OK
RWANDA	32	RUKOMO	87	0,12	11,50%	8,19%	-1.288.607	n.a	n.a	-15.148	-0,10	NO	NO	NO	NO	NO
RWANDA	33	NYACYONGA	161	0,22	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
RWANDA	34	RUHANGO	820	1,12	11,50%	8,19%	-792.747	n.a	n.a	11.255	0,09	NO	NO	YES	NO	NO
RWANDA	35	BUTARE	1.288	1,76	11,50%	8,19%	-113.956	6,94%	6,86%	129.378	0,79	NO	NO	YES	NO	NO
BURUNDI	36	KAYANZA	86	0,12	11,50%	8,19%	-858.442	n.a	n.a	-11.871	-0,12	NO	NO	NO	NO	NO
BURUNDI	37	BUGARAMA	143	0,20	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO
KENYA	38	MAAI MAHIU	913	1,25	11,50%	8,19%	1.333.421	21,37%	35,30%	322.726	2,12	YES	YES	YES	YES	OK
KENYA	39	YALA	290	0,40	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
KENYA	40	SEGA TOWN	193	0,26	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
KENYA	41	KORINDA JUNCTION	1.675	2,29	11,50%	8,19%	971.127	13,65%	18,66%	390.628	1,34	YES	YES	YES	YES	OK
UGANDA	42	KUMI	987	1,35	11,50%	8,19%	1.470.633	25,20%	44,71%	320.363	2,55	YES	YES	YES	YES	OK
UGANDA	43	LIRA	847	1,16	11,50%	8,19%	1.333.374	21,37%	35,30%	322.719	2,12	YES	YES	YES	YES	OK
UGANDA	44	KAMDINI	707	0,97	11,50%	8,19%	75.122	9,30%	10,77%	113.145	0,97	YES	NO	YES	NO	NO
UGANDA	45	GULU	567	0,78	11,50%	8,19%	-70.057	7,29%	7,43%	114.326	0,81	NO	NO	YES	NO	NO
UGANDA	46	ELEGU	1.403	1,92	11,50%	8,19%	1.054.329	14,07%	19,48%	402.982	1,38	YES	YES	YES	YES	OK
SOUTH SUDAN	47	NIMULE	287	0,39	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
SOUTH SUDAN	48	NASITU	147	0,20	11,50%	8,19%	-858.442	n.a	n.a	-11.871	-0,12	NO	NO	NO	NO	NO
UGANDA	49	MIGEERA	593	0,81	11,50%	8,19%	-62.090	7,40%	7,60%	115.509	0,82	NO	NO	YES	NO	NO
UGANDA	50	KARUMA	494	0,68	11,50%	8,19%	-111.275	6,75%	6,54%	108.205	0,78	NO	NO	YES	NO	NO
UGANDA	51	PURONGO	396	0,54	11,50%	8,19%	-715.461	n.a	n.a	5.103	0,05	NO	NO	YES	NO	NO
UGANDA	52	PAKWACH	297	0,41	11,50%	8,19%	-993.607	n.a	n.a	-8.215	-0,07	NO	NO	NO	NO	NO
UGANDA	53	ARUA	198	0,27	11,50%	8,19%	-1.038.141	n.a	n.a	-13.502	-0,11	NO	NO	NO	NO	NO
UGANDA	54	ORABA	99	0,14	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO
UGANDA	55	MIRAMA HILLS	241	0,33	11,50%	8,19%	-1.038.141	n.a	n.a	-13.502	-0,11	NO	NO	NO	NO	NO
UGANDA	56	RYABEGA	161	0,22	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
UGANDA	57	RUGENDE	80	0,11	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO
UGANDA	58	ISHAKA	441	0,60	11,50%	8,19%	60.266	9,08%	10,41%	110.939	0,95	YES	NO	YES	NO	NO
UGANDA	59	MPONDWE	2.226	3,05	11,50%	8,19%	1.075.712	14,18%	19,69%	406.157	1,39	YES	YES	YES	YES	OK
DRC	60	BENI	1.781	2,44	11,50%	8,19%	1.004.436	13,82%	18,99%	395.574	1,35	YES	YES	YES	YES	OK
DRC	61	KOMANDA	221	0,30	11,50%	8,19%	-1.002.420	n.a	n.a	-13.502	-0,11	NO	NO	NO	NO	NO
DRC	62	NIANIA	147	0,20	11,50%	8,19%	-1.028.228	n.a	n.a	-16.565	-0,14	NO	NO	NO	NO	NO
DRC	63	KISANGANI	73	0,10	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO
DRC	64	BUNAGANA	2.305	3,16	11,50%	8,19%	1.069.559	14,15%	19,63%	405.244	1,38	YES	YES	YES	YES	OK
DRC	65	GOMA	1.153	1,58	11,50%	8,19%	-523.223	4,55%	3,06%	168.734	0,63	NO	NO	YES	NO	NO
RWANDA	66	KITABI	86	0,12	11,50%	8,19%	-858.442	n.a	n.a	-11.871	-0,12	NO	NO	NO	NO	NO
DRC	67	BUKAVU	43	0,06	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO

AVERAGE DATA			11,50%	8,19%	-69.819	11,64%	15,66%	158.095	0,68
WEIGHTED AVERAGE DATA			11,50%	8,19%	700.769	12,11%	16,96%	314.749	1,20

Table B: Classification of RSS upon financial outcomes: *bankable* RSS, feasible RSS with public subsidies and non sustainable RSS

COUNTRY		NAME	Demand		RSS operation		Financial profitability		Bankability cases (DSCR)	May need Public support	Not profitable
			Users day #	Users %	Sustainable	Unsustainable	Global (unlevered)	Equity (levered)			
KENYA	1	MIRITINI	1.384	1,90	MIRITINI		MIRITINI	MIRITINI		MIRITINI	
KENYA	2	TARU	747	1,02	TARU					TARU	
KENYA	3	MACKINNON ROAD II	3.018	4,13	MACKINNON ROAD II		MACKINNON ROAD II	MACKINNON ROAD II	MACKINNON ROAD II		
KENYA	4	MAUNGU	410	0,56	MAUNGU					MAUNGU	
KENYA	5	VOI	2.854	3,91	VOI		VOI	VOI	VOI		
KENYA	6	MANYANI	319	0,44		MANYANI					MANYANI
KENYA	7	MTITO ANDEI	3.180	4,36	MTITO ANDEI		MTITO ANDEI	MTITO ANDEI	MTITO ANDEI		
KENYA	8	MAKINDU	197	0,27		MAKINDU					MAKINDU
KENYA	9	SULTAN HAMUD	512	0,70	SULTAN HAMUD					SULTAN HAMUD	
KENYA	10	JUNCTION MACHAKOS	896	1,23	JUNCTION MACHAKOS					JUNCTION MACHAKOS	
KENYA	11	NAIVASHA	861	1,18	NAIVASHA		NAIVASHA			NAIVASHA	
KENYA	12	NAKURU	3.850	5,27	NAKURU		NAKURU	NAKURU	NAKURU		
KENYA	13	SALGAA	3.670	5,03	SALGAA		SALGAA	SALGAA	SALGAA		
KENYA	14	MAU SUMMIT	579	0,79	MAU SUMMIT					MAU SUMMIT	
KENYA	15	BURNT FOREST	425	0,58	BURNT FOREST					BURNT FOREST	
KENYA	16	JUA KALI	744	1,02	JUA KALI					JUA KALI	
KENYA	17	WEBUYE	873	1,20	WEBUYE		WEBUYE	WEBUYE	WEBUYE		
KENYA	18	MALABA	901	1,23	MALABA		MALABA	MALABA	MALABA		
UGANDA	19	BUSITEMA	2.823	3,87	BUSITEMA		BUSITEMA	BUSITEMA	BUSITEMA		
UGANDA	20	NALUWERERE	234	0,32		NALUWERERE					NALUWERERE
UGANDA	21	IDUDI	3.176	4,35		IDUDI					IDUDI
UGANDA	22	MBIKO	601	0,82	MBIKO					MBIKO	
UGANDA	23	LUGAZI	3.912	5,36	LUGAZI		LUGAZI	LUGAZI	LUGAZI		
UGANDA	24	BUWAMA	139	0,19		BUWAMA					BUWAMA
UGANDA	25	LUKAYA	547	0,75	LUKAYA					LUKAYA	
UGANDA	26	MASAKA ROAD	6.417	8,79	MASAKA ROAD		MASAKA ROAD	MASAKA ROAD	MASAKA ROAD		
UGANDA	27	LYANTONDE	515	0,71	LYANTONDE					LYANTONDE	
UGANDA	28	MBARARA	3.117	4,27	MBARARA		MBARARA	MBARARA	MBARARA		
UGANDA	29	BIHARWE	412	0,56	BIHARWE					BIHARWE	
UGANDA	30	NTUNGAMO	193	0,26		NTUNGAMO					NTUNGAMO
UGANDA	31	KABALE	3.867	5,30	KABALE		KABALE	KABALE	KABALE		
RWANDA	32	RUKOMO	87	0,12		RUKOMO					RUKOMO
RWANDA	33	NYACYONGA	161	0,22		NYACYONGA					NYACYONGA
RWANDA	34	RUHANGO	820	1,12	RUHANGO					RUHANGO	
RWANDA	35	BUTARE	1.288	1,76	BUTARE					BUTARE	
BURUNDI	36	KAYANZA	86	0,12		KAYANZA					KAYANZA
BURUNDI	37	BUGARAMA	143	0,20		BUGARAMA					BUGARAMA
KENYA	38	MAAI MAHIU	913	1,25	MAAI MAHIU		MAAI MAHIU	MAAI MAHIU	MAAI MAHIU		
KENYA	39	YALA	290	0,40		YALA					YALA
KENYA	40	SEGA TOWN	193	0,26		SEGA TOWN					SEGA TOWN
KENYA	41	KORINDA JUNCTION	1.675	2,29	KORINDA JUNCTION		KORINDA JUNCTION	KORINDA JUNCTION	KORINDA JUNCTION		
UGANDA	42	KUMI	987	1,35	KUMI		KUMI	KUMI	KUMI		
UGANDA	43	LIRA	847	1,16	LIRA		LIRA	LIRA	LIRA		
UGANDA	44	KAMDINI	707	0,97	KAMDINI		KAMDINI			KAMDINI	
UGANDA	45	GULU	567	0,78	GULU					GULU	
UGANDA	46	ELEGU	1.403	1,92	ELEGU		ELEGU	ELEGU	ELEGU		
SOUTH SUDAN	47	NIMULE	287	0,39		NIMULE					NIMULE
SOUTH SUDAN	48	NASITU	147	0,20		NASITU					NASITU
UGANDA	49	MIGEERA	593	0,81	MIGEERA					MIGEERA	
UGANDA	50	KARUMA	494	0,68	KARUMA					KARUMA	
UGANDA	51	PURONGO	396	0,54	PURONGO					PURONGO	
UGANDA	52	PAKWACH	297	0,41		PAKWACH					PAKWACH
UGANDA	53	ARUA	198	0,27		ARUA					ARUA
UGANDA	54	ORABA	99	0,14		ORABA					ORABA
UGANDA	55	MIRAMA HILLS	241	0,33		MIRAMA HILLS					MIRAMA HILLS
UGANDA	56	RYABEGA	161	0,22		RYABEGA					RYABEGA
UGANDA	57	RUGENDE	80	0,11		RUGENDE					RUGENDE
UGANDA	58	ISHAKA	441	0,60	ISHAKA		ISHAKA			ISHAKA	
UGANDA	59	MPONDWE	2.226	3,05	MPONDWE		MPONDWE	MPONDWE	MPONDWE		
DRC	60	BENI	1.781	2,44	BENI		BENI	BENI	BENI		
DRC	61	KOMANDA	221	0,30		KOMANDA					KOMANDA
DRC	62	NIANIA	147	0,20		NIANIA					NIANIA
DRC	63	KISANGANI	73	0,10		KISANGANI					KISANGANI
DRC	64	BUNAGANA	2.305	3,16	BUNAGANA		BUNAGANA	BUNAGANA	BUNAGANA		
DRC	65	GOMA	1.153	1,58	GOMA					GOMA	
RWANDA	66	KITABI	86	0,12		KITABI					KITABI
DRC	67	BUKAVU	43	0,06		BUKAVU					BUKAVU

From the analysis of the Base Case, we can highlight the following additional considerations:

- **About the entire network of ALL RSS**
  - Users per day 73,009
  - Weighted average NPV, discounted at WACC 700,769 US$
  - Weighted average Project IRR 12.11 %
  - Equity IRR (with conditions described in the study) 16.96 %
  - Debt Service Covered Ratio (DSCR) (average 5 first years) 1,20
- **About each of the RSS**
  - **20 RSS** (29.85%) seem to be totally feasible from a financial perspective: globally financially feasible and bankable, and therefore could be of interest of private investors and PPP schemes.
  - **22 RSS** (32.84%) could be financially feasible with a certain financial support from Public Authorities or Institutional / Multi-lateral funding. The level of financial support must be analyzed case by case.
  - **25 RSS** (37.31%) have low potential for further private financing schemes. They are not even sustainable by themselves from an operational point of view. Average EBITDA < 0. If projection completion is a key issue in these RSS cases, Public support would be needed for reaching financial profitability levels, and also to cover at least operational expenses.
- **Sensitivities**

We have implemented the following sensitivities on the Base Case:

- 25% increase on CAPEX
- 50% increase on OPEX
- 100% increase in OPEX
- 25% on CAPEX plus 50% of increase in OPEX.

The results are summarized in the following table:

INDIVIDUAL QUALIFICATION OF RSS

concept	BASE CASE	SENSITIVITIES			
	RSS	CAPEX	OPEX 1	OPEX 2	CAPEX + OPEX 1
bankable	20	8	12	9	4
may need public support	22	34	29	32	37
not sustainable	25	25	26	26	26
	67	67	67	67	67

Hence, the most robust outcomes (sensitivity of 25% in Capex plus 50% in Opex) are clearly the RSS of **Webuye, Maai Mahiu, Kumi and Lira,** and these could be the first RSS to consider in terms of potential and specific PPP experiences.

But our results and approach show nevertheless also the process to follow if TMEA and TTCA-NC should be interested not only in a case by case analysis of the most bankable RSS, but in a more

complete “network” in which the most profitable cases could finance the cases of some other RSS, less profitable, but with some potential network effects alongside the NC.

8. FINANCIAL RESULTS AND RSS GROUPS

8.1.1. RSS CATEGORIES FROM FINANCIAL OUTCOMES

As it was stated and justified in the previous report we could highlight three types of RSS categories, according to their private financing potential in any further PPP process to be developed or encouraged by TTCA-NC and TMEA

Hence with the assumptions adopted we can distinguish these **3 groups** from the 67 original analyzed cases:

- **Group 1: 20 RSS (29.85%) could be totally feasible from a financial perspective and further PPP considerations.**
  - They are naturally globally financially feasible (Project IRR > WACC)
  - They are potentially profitable for private sponsors (Equity IRR > Ke)
  - They are financially solvent and potentially and bankable (DSCR > 1.3)

➔ **Therefore these 20 RSS could be of interest for private investors and they could be candidates in a PPP process and financed without any need in terms of further Public support (funding, subsidy..).**

Table: Group 1. RSS cases with high private financing potential

Mackinnon road II	**Webuye**	**Mbarara**	**Lira**
Voi	**Malaba**	**Kabale**	**Elegu**
Mtito Andei	**Busitema**	**Maai Mahiu**	**Mpondwe**
Nakuru	**Lugazi**	**Korinda Junction**	**Beni**
Salgaa	**Masaka road**	**Kumi**	**Bunagana**

- **Group 2: 22 RSS (32.84%) could be financially feasible with a certain financial support from Public Authorities or Institutional / Multi-lateral funding**.
  - In this group, in some RSS cases financial profitability can't be reached without some public support (Project IRR < WACC but Project IRR >0)
  - In some other cases RSS are already financially feasible (Project IRR > WACC) but they simply do not reach *bankability* levels (DSCR < 1.3)

➔ **In this group RSS are also potentially profitable and / or bankable but they are not 100% financially sustainable by themselves. The levels of effective financial support must be analyzed case by case (which is something possible with the financial model implemented).**

Table: Group 2. RSS cases with private financing potential if partially publicly financed

Miritini	Mau Summit	Biharwe	Karuma
Taru	Burnt Forest	Ruhango*	Purongo*
Maungu	Jua Kali	Butare	Ishaka
Sultan Hamud	Mbiko	Kamdini	Goma
Junction Machakos	Lukaya	Gulu	
Naivasha	Lyantonde	Migeera	

*Red= profitable and almost bankable / Blue = almost profitable / * = very low positive return*

- **Group 3: 25 RSS (37.31%) are not sustainable by themselves from an operational point of view: o**perational costs are not covered by regular income
  - In all cases we have: average EBITDA < 0, which implies that here is a permanent loss in Profit & Loss statement.
  - Therefore, RSS in this group can't be proposed for financing without solving before three types of public financial support:
    - ✓ First, annual public inflows to make profitable the operational process and reach positive EBITDA
    - ✓ Second, annual public inflows to habilitate an additional cash generation process in which free cash flows can generate IRR > WACC
    - ✓ Third, additional public inflows so as to:
      - repay the debt with solvency (and bankability, with at least: DSCR>1.3)
      - Compensate all Equity funding providers (Equity IRR > Ke)

➔ RSS in this group do not create positive operational cash flows: if projection completion of any RSS in this group is nevertheless a key issue for public authorities[34] Public financial support would be needed not only to reach financial profitability levels, but basically to cover at least operational expenses.

[34] because of, for instance, some network effects along the NC or some compensating actions within NC countries

Table: Group 3. RSS cases with low private financing potential

Manyani	Ntungamo	Yala	Arua	Komanda
Makindu	Rukomo	Sega Town	Oraba	Niania
Naluwerere	Nyacyonga	Nimule	Mirama Hills	Kisangani
Idudi	Kayanza	Nasitu	Ryabega	Kitabi
Buwama	Bugarama	Pakwach	Rugende	Bukavu

8.1.2. GRAPHICAL REPRESENTATIONS OF RSS CASES

Figure: RSS globally financially feasible (Pr IRR > WACC)

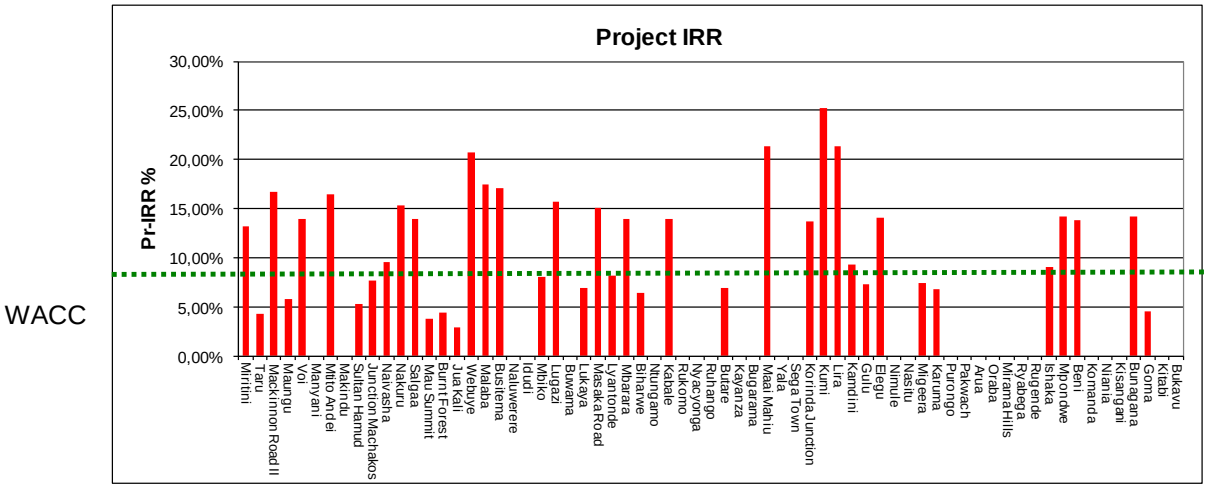


Figure: RSS financially sustainable & profitable for equity providers (Eq IRR > Ke)

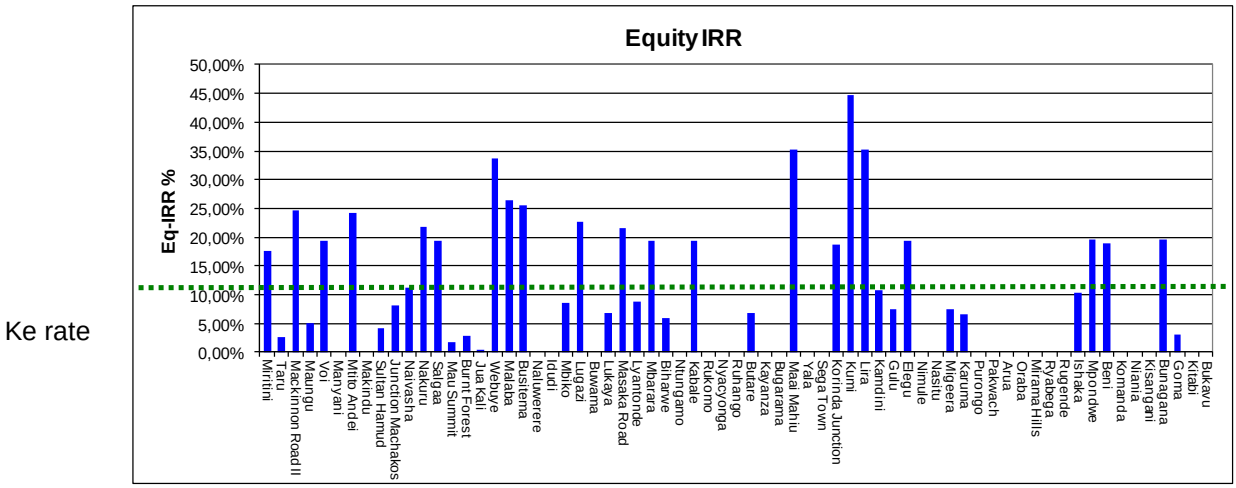


Figure: RSS financially bankable (DSCR>1.3)

DSCR min

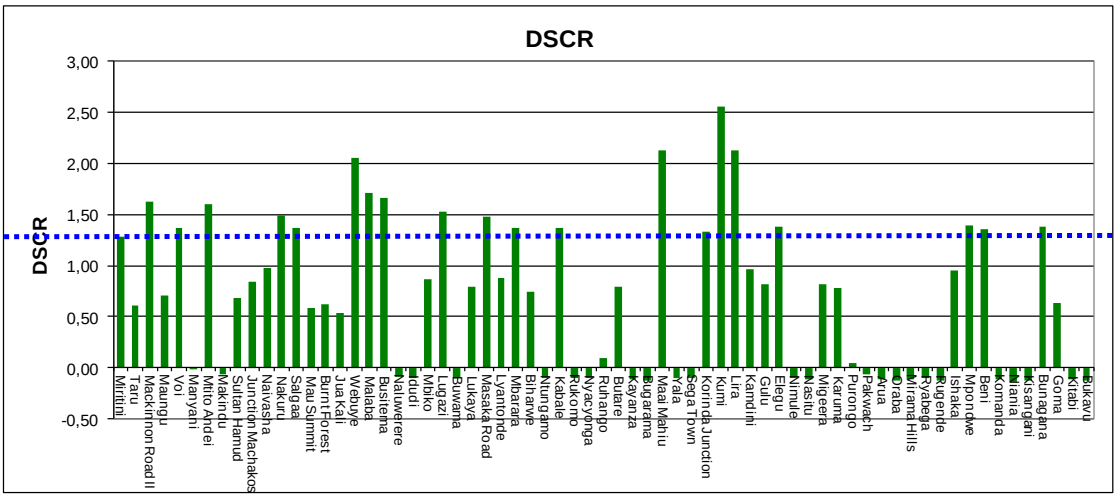


Table A: summary of key financial indicators for the 67 RSS. Proposed *bankable* RSS

COUNTRY		NAME	Users day	Users	Ke	WACC	NPV	Pr-IRR	Eq-IRR	EBITDA	DSCR	Financial feasibility	Equity profitability	Operation sustainability	Bankability	Proposed RSS
			#	%	%	%	US$	%	%	US$	x					
KENYA	1	MIRITINI	1.384	1,90	11,50%	8,19%	727.376	13,13%	17,65%	316.097	1,29	YES	YES	YES	NO	NO
KENYA	2	TARU	747	1,02	11,50%	8,19%	-419.897	4,26%	2,62%	123.349	0,61	NO	NO	YES	NO	NO
KENYA	3	MACKINNON ROAD II	3.018	4,13	11,50%	8,19%	1.327.491	16,66%	24,72%	404.443	1,63	YES	YES	YES	YES	OK
KENYA	4	MAUNGU	410	0,56	11,50%	8,19%	-189.563	5,84%	5,08%	105.965	0,71	NO	NO	YES	NO	NO
KENYA	5	VOI	2.854	3,91	11,50%	8,19%	1.084.067	13,98%	19,29%	419.894	1,37	YES	YES	YES	YES	OK
KENYA	6	MANYANI	319	0,44	11,50%	8,19%	-979.707	n.a	n.a	-594	-0,01	NO	NO	NO	NO	NO
KENYA	7	MTITO ANDEI	3.180	4,36	11,50%	8,19%	1.257.198	16,41%	24,21%	389.253	1,60	YES	YES	YES	YES	OK
KENYA	8	MAKINDU	197	0,27	11,50%	8,19%	-782.346	n.a	n.a	-6.013	-0,06	NO	NO	NO	NO	NO
KENYA	9	SULTAN HAMUD	512	0,70	11,50%	8,19%	-337.291	5,32%	4,27%	148.443	0,68	NO	NO	YES	NO	NO
KENYA	10	JUNCTION MACHAKOS	896	1,23	11,50%	8,19%	-115.775	7,70%	8,10%	366.625	0,84	NO	NO	YES	NO	NO
KENYA	11	NAIVASHA	861	1,18	11,50%	8,19%	292.825	9,56%	11,21%	370.162	0,98	YES	NO	YES	NO	NO
KENYA	12	NAKURU	3.850	5,27	11,50%	8,19%	1.201.822	15,26%	21,82%	408.674	1,49	YES	YES	YES	YES	OK
KENYA	13	SALGAA	3.670	5,03	11,50%	8,19%	1.084.067	13,98%	19,29%	419.894	1,37	YES	YES	YES	YES	OK
KENYA	14	MAU SUMMIT	579	0,79	11,50%	8,19%	-480.014	3,77%	1,85%	119.961	0,58	NO	NO	YES	NO	NO
KENYA	15	BURNT FOREST	425	0,58	11,50%	8,19%	-444.933	4,37%	2,79%	136.261	0,62	NO	NO	YES	NO	NO
KENYA	16	JUA KALI	744	1,02	11,50%	8,19%	-575.500	2,91%	0,54%	111.877	0,53	NO	NO	YES	NO	NO
KENYA	17	WEBUYE	873	1,20	11,50%	8,19%	1.301.130	20,71%	33,74%	322.726	2,05	YES	YES	YES	YES	OK
KENYA	18	MALABA	901	1,23	11,50%	8,19%	1.165.458	17,45%	26,41%	338.060	1,71	YES	YES	YES	YES	OK
UGANDA	19	BUSITEMA	2.823	3,87	11,50%	8,19%	1.275.083	17,03%	25,52%	378.246	1,67	YES	YES	YES	YES	OK
UGANDA	20	NALUWERERE	234	0,32	11,50%	8,19%	-948.416	n.a	n.a	-10.853	-0,09	NO	NO	NO	NO	NO
UGANDA	21	IDUDI	3.176	4,35	11,50%	8,19%	-938.570	n.a	n.a	-11.871	-0,10	NO	NO	NO	NO	NO
UGANDA	22	MBIKO	601	0,82	11,50%	8,19%	-15.573	7,99%	8,57%	122.416	0,86	NO	NO	YES	NO	NO
UGANDA	23	LUGAZI	3.912	5,36	11,50%	8,19%	1.249.094	15,65%	22,63%	410.456	1,53	YES	YES	YES	YES	OK
UGANDA	24	BUWAMA	139	0,19	11,50%	8,19%	-938.570	n.a	n.a	-11.871	-0,10	NO	NO	NO	NO	NO
UGANDA	25	LUKAYA	547	0,75	11,50%	8,19%	-102.301	6,91%	6,81%	114.333	0,79	NO	NO	YES	NO	NO
UGANDA	26	MASAKA ROAD	6.417	8,79	11,50%	8,19%	1.368.496	15,12%	21,55%	470.583	1,48	YES	YES	YES	YES	OK
UGANDA	27	LYANTONDE	515	0,71	11,50%	8,19%	-4.556	8,12%	8,79%	113.145	0,87	NO	NO	YES	NO	NO
UGANDA	28	MBARARA	3.117	4,27	11,50%	8,19%	1.084.067	13,98%	19,29%	419.894	1,37	YES	YES	YES	YES	OK
UGANDA	29	BIHARWE	412	0,56	11,50%	8,19%	-143.566	6,38%	5,95%	108.205	0,75	NO	NO	YES	NO	NO
UGANDA	30	NTUNGAMO	193	0,26	11,50%	8,19%	-1.292.720	n.a	n.a	-15.593	-0,10	NO	NO	NO	NO	NO
UGANDA	31	KABALE	3.867	5,30	11,50%	8,19%	1.084.067	13,98%	19,29%	419.894	1,37	YES	YES	YES	YES	OK
RWANDA	32	RUKOMO	87	0,12	11,50%	8,19%	-1.288.607	n.a	n.a	-15.148	-0,10	NO	NO	NO	NO	NO
RWANDA	33	NYACYONGA	161	0,22	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
RWANDA	34	RUHANGO	820	1,12	11,50%	8,19%	-792.747	n.a	n.a	11.255	0,09	NO	NO	YES	NO	NO
RWANDA	35	BUTARE	1.288	1,76	11,50%	8,19%	-113.956	6,94%	6,86%	129.378	0,79	NO	NO	YES	NO	NO
BURUNDI	36	KAYANZA	86	0,12	11,50%	8,19%	-858.442	n.a	n.a	-11.871	-0,12	NO	NO	NO	NO	NO
BURUNDI	37	BUGARAMA	143	0,20	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO
KENYA	38	MAAI MAHIU	913	1,25	11,50%	8,19%	1.333.421	21,37%	35,30%	322.726	2,12	YES	YES	YES	YES	OK
KENYA	39	YALA	290	0,40	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
KENYA	40	SEGA TOWN	193	0,26	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
KENYA	41	KORINDA JUNCTION	1.675	2,29	11,50%	8,19%	971.127	13,65%	18,66%	390.628	1,34	YES	YES	YES	YES	OK
UGANDA	42	KUMI	987	1,35	11,50%	8,19%	1.470.633	25,20%	44,71%	320.363	2,55	YES	YES	YES	YES	OK
UGANDA	43	LIRA	847	1,16	11,50%	8,19%	1.333.374	21,37%	35,30%	322.719	2,12	YES	YES	YES	YES	OK
UGANDA	44	KAMDINI	707	0,97	11,50%	8,19%	75.122	9,30%	10,77%	113.145	0,97	YES	NO	YES	NO	NO
UGANDA	45	GULU	567	0,78	11,50%	8,19%	-70.057	7,29%	7,43%	114.326	0,81	NO	NO	YES	NO	NO
UGANDA	46	ELEGU	1.403	1,92	11,50%	8,19%	1.054.329	14,07%	19,48%	402.982	1,38	YES	YES	YES	YES	OK
SOUTH SUDAN	47	NIMULE	287	0,39	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
SOUTH SUDAN	48	NASITU	147	0,20	11,50%	8,19%	-858.442	n.a	n.a	-11.871	-0,12	NO	NO	NO	NO	NO
UGANDA	49	MIGEERA	593	0,81	11,50%	8,19%	-62.090	7,40%	7,60%	115.509	0,82	NO	NO	YES	NO	NO
UGANDA	50	KARUMA	494	0,68	11,50%	8,19%	-111.275	6,75%	6,54%	108.205	0,78	NO	NO	YES	NO	NO
UGANDA	51	PURONGO	396	0,54	11,50%	8,19%	-715.461	n.a	n.a	5.103	0,05	NO	NO	YES	NO	NO
UGANDA	52	PAKWACH	297	0,41	11,50%	8,19%	-993.607	n.a	n.a	-8.215	-0,07	NO	NO	NO	NO	NO
UGANDA	53	ARUA	198	0,27	11,50%	8,19%	-1.038.141	n.a	n.a	-13.502	-0,11	NO	NO	NO	NO	NO
UGANDA	54	ORABA	99	0,14	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO
UGANDA	55	MIRAMA HILLS	241	0,33	11,50%	8,19%	-1.038.141	n.a	n.a	-13.502	-0,11	NO	NO	NO	NO	NO
UGANDA	56	RYABEGA	161	0,22	11,50%	8,19%	-849.151	n.a	n.a	-10.768	-0,10	NO	NO	NO	NO	NO
UGANDA	57	RUGENDE	80	0,11	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO
UGANDA	58	ISHAKA	441	0,60	11,50%	8,19%	60.266	9,08%	10,41%	110.939	0,95	YES	NO	YES	NO	NO
UGANDA	59	MPONDWE	2.226	3,05	11,50%	8,19%	1.075.712	14,18%	19,69%	406.157	1,39	YES	YES	YES	YES	OK
DRC	60	BENI	1.781	2,44	11,50%	8,19%	1.004.436	13,82%	18,99%	395.574	1,35	YES	YES	YES	YES	OK
DRC	61	KOMANDA	221	0,30	11,50%	8,19%	-1.002.420	n.a	n.a	-13.502	-0,11	NO	NO	NO	NO	NO
DRC	62	NIANIA	147	0,20	11,50%	8,19%	-1.028.228	n.a	n.a	-16.565	-0,14	NO	NO	NO	NO	NO
DRC	63	KISANGANI	73	0,10	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO
DRC	64	BUNAGANA	2.305	3,16	11,50%	8,19%	1.069.559	14,15%	19,63%	405.244	1,38	YES	YES	YES	YES	OK
DRC	65	GOMA	1.153	1,58	11,50%	8,19%	-523.223	4,55%	3,06%	168.734	0,63	NO	NO	YES	NO	NO
RWANDA	66	KITABI	86	0,12	11,50%	8,19%	-858.442	n.a	n.a	-11.871	-0,12	NO	NO	NO	NO	NO
DRC	67	BUKAVU	43	0,06	11,50%	8,19%	-1.063.949	n.a	n.a	-16.565	-0,13	NO	NO	NO	NO	NO

AVERAGE DATA			11,50%	8,19%	-69.819	11,64%	15,66%	158.095	0,68
WEIGHTED AVERAGE DATA			11,50%	8,19%	700.769	12,11%	16,96%	314.749	1,20

Table B: Classification of RSS upon financial outcomes: *bankable* RSS, feasible RSS with public subsidies and non sustainable RSS

COUNTRY		NAME	Demand		RSS operation		Financial profitability		Bankability cases (DSCR)	May need Public support	Not profitable
			Users day #	Users %	Sustainable	Unsustainable	Global (unlevered)	Equity (levered)			
KENYA	1	MIRITINI	1.384	1,90	MIRITINI		MIRITINI	MIRITINI		MIRITINI	
KENYA	2	TARU	747	1,02	TARU					TARU	
KENYA	3	MACKINNON ROAD II	3.018	4,13	MACKINNON ROAD II		MACKINNON ROAD II	MACKINNON ROAD II	MACKINNON ROAD II		
KENYA	4	MAUNGU	410	0,56	MAUNGU					MAUNGU	
KENYA	5	VOI	2.854	3,91	VOI		VOI	VOI	VOI		
KENYA	6	MANYANI	319	0,44		MANYANI					MANYANI
KENYA	7	MTITO ANDEI	3.180	4,36	MTITO ANDEI		MTITO ANDEI	MTITO ANDEI	MTITO ANDEI		
KENYA	8	MAKINDU	197	0,27		MAKINDU					MAKINDU
KENYA	9	SULTAN HAMUD	512	0,70	SULTAN HAMUD					SULTAN HAMUD	
KENYA	10	JUNCTION MACHAKOS	896	1,23	JUNCTION MACHAKOS					JUNCTION MACHAKOS	
KENYA	11	NAIVASHA	861	1,18	NAIVASHA		NAIVASHA			NAIVASHA	
KENYA	12	NAKURU	3.850	5,27	NAKURU		NAKURU	NAKURU	NAKURU		
KENYA	13	SALGAA	3.670	5,03	SALGAA		SALGAA	SALGAA	SALGAA		
KENYA	14	MAU SUMMIT	579	0,79	MAU SUMMIT					MAU SUMMIT	
KENYA	15	BURNT FOREST	425	0,58	BURNT FOREST					BURNT FOREST	
KENYA	16	JUA KALI	744	1,02	JUA KALI					JUA KALI	
KENYA	17	WEBUYE	873	1,20	WEBUYE		WEBUYE	WEBUYE	WEBUYE		
KENYA	18	MALABA	901	1,23	MALABA		MALABA	MALABA	MALABA		
UGANDA	19	BUSITEMA	2.823	3,87	BUSITEMA		BUSITEMA	BUSITEMA	BUSITEMA		
UGANDA	20	NALUWERERE	234	0,32		NALUWERERE					NALUWERERE
UGANDA	21	IDUDI	3.176	4,35		IDUDI					IDUDI
UGANDA	22	MBIKO	601	0,82	MBIKO					MBIKO	
UGANDA	23	LUGAZI	3.912	5,36	LUGAZI		LUGAZI	LUGAZI	LUGAZI		
UGANDA	24	BUWAMA	139	0,19		BUWAMA					BUWAMA
UGANDA	25	LUKAYA	547	0,75	LUKAYA					LUKAYA	
UGANDA	26	MASAKA ROAD	6.417	8,79	MASAKA ROAD		MASAKA ROAD	MASAKA ROAD	MASAKA ROAD		
UGANDA	27	LYANTONDE	515	0,71	LYANTONDE					LYANTONDE	
UGANDA	28	MBARARA	3.117	4,27	MBARARA		MBARARA	MBARARA	MBARARA		
UGANDA	29	BIHARWE	412	0,56	BIHARWE					BIHARWE	
UGANDA	30	NTUNGAMO	193	0,26		NTUNGAMO					NTUNGAMO
UGANDA	31	KABALE	3.867	5,30	KABALE		KABALE	KABALE	KABALE		
RWANDA	32	RUKOMO	87	0,12		RUKOMO					RUKOMO
RWANDA	33	NYACYONGA	161	0,22		NYACYONGA					NYACYONGA
RWANDA	34	RUHANGO	820	1,12	RUHANGO					RUHANGO	
RWANDA	35	BUTARE	1.288	1,76	BUTARE					BUTARE	
BURUNDI	36	KAYANZA	86	0,12		KAYANZA					KAYANZA
BURUNDI	37	BUGARAMA	143	0,20		BUGARAMA					BUGARAMA
KENYA	38	MAAI MAHIU	913	1,25	MAAI MAHIU		MAAI MAHIU	MAAI MAHIU	MAAI MAHIU		
KENYA	39	YALA	290	0,40		YALA					YALA
KENYA	40	SEGA TOWN	193	0,26		SEGA TOWN					SEGA TOWN
KENYA	41	KORINDA JUNCTION	1.675	2,29	KORINDA JUNCTION		KORINDA JUNCTION	KORINDA JUNCTION	KORINDA JUNCTION		
UGANDA	42	KUMI	987	1,35	KUMI		KUMI	KUMI	KUMI		
UGANDA	43	LIRA	847	1,16	LIRA		LIRA	LIRA	LIRA		
UGANDA	44	KAMDINI	707	0,97	KAMDINI		KAMDINI			KAMDINI	
UGANDA	45	GULU	567	0,78	GULU					GULU	
UGANDA	46	ELEGU	1.403	1,92	ELEGU		ELEGU	ELEGU	ELEGU		
SOUTH SUDAN	47	NIMULE	287	0,39		NIMULE					NIMULE
SOUTH SUDAN	48	NASITU	147	0,20		NASITU					NASITU
UGANDA	49	MIGEERA	593	0,81	MIGEERA					MIGEERA	
UGANDA	50	KARUMA	494	0,68	KARUMA					KARUMA	
UGANDA	51	PURONGO	396	0,54	PURONGO					PURONGO	
UGANDA	52	PAKWACH	297	0,41		PAKWACH					PAKWACH
UGANDA	53	ARUA	198	0,27		ARUA					ARUA
UGANDA	54	ORABA	99	0,14		ORABA					ORABA
UGANDA	55	MIRAMA HILLS	241	0,33		MIRAMA HILLS					MIRAMA HILLS
UGANDA	56	RYABEGA	161	0,22		RYABEGA					RYABEGA
UGANDA	57	RUGENDE	80	0,11		RUGENDE					RUGENDE
UGANDA	58	ISHAKA	441	0,60	ISHAKA		ISHAKA			ISHAKA	
UGANDA	59	MPONDWE	2.226	3,05	MPONDWE		MPONDWE	MPONDWE	MPONDWE		
DRC	60	BENI	1.781	2,44	BENI		BENI	BENI	BENI		
DRC	61	KOMANDA	221	0,30		KOMANDA					KOMANDA
DRC	62	NIANIA	147	0,20		NIANIA					NIANIA
DRC	63	KISANGANI	73	0,10		KISANGANI					KISANGANI
DRC	64	BUNAGANA	2.305	3,16	BUNAGANA		BUNAGANA	BUNAGANA	BUNAGANA		
DRC	65	GOMA	1.153	1,58	GOMA					GOMA	
RWANDA	66	KITABI	86	0,12		KITABI					KITABI
DRC	67	BUKAVU	43	0,06		BUKAVU					BUKAVU

9. FINAL RECOMMENDATIONS ON PPP PACKAGINNG

According to all information and outcomes displayed during the financial phase we are presenting a set of recommendations for the further PPP process regarding RSS project implementation.

The **final strategy** to be adopted on this process will heavily depend on TMEA, TTCA-NC and other East Africa Public Agents interests and resources capabilities at launching such a challenging programme.

Hence, we could say that, apart from the logical institutional, National and budgeting restrictions that could arise in the future, the key elements to consider for an effective Programme implementation will be:

- the magnitude and scope to adopt in this PPP process and
- the targeted timing for reaching the different stages in the process
- the level of effective regional integration to be reached in the medium term since even if the RSS program will be led and structured by a regional and specific Unit, all PPP cases will still be contracted on a national level[35]

In that sense, we have highlighted the following recommendations, according strictly to the quantitative financial outcomes reached.

9.1.1. STRATEGY 1: A RELEVANT PACKAGE OF RSS TO BE IMPLEMENTED

- If the PPP process pursued is to be launched as a full RSS Program (looking for network effects, a fair presence of countries alongside the NC,…) then a first recommendation would be to start with RSS within Group 1
- A logical extension would be to include also some selected RSS cases from group 2: the cases which are more near of bankability levels.
- This Program strategy minimizes Public financial supports, but Public authorities will have nevertheless a crucial role in promoting and leading the full PPP process via the New Entity.
- A possible PPP contractual outcome could be that a private company finances, builds and operates the RSS (or a group), allowing for contracting with third parties for the construction and certain specific operations in the operation phase
- By nature we think this is a medium / long term RSS PPP strategy (5 – 8 years)
- In theory with this strategy it would be possible to gradually reach in the long run an even more complete “network” of RSS (adding more cases from Group 2)
- In this latter case the most profitable cases could finance (subsidize) the cases of some other RSS, less profitable, but with some potential network effects alongside the NC.

[35] We assume that, as indicated on the NC Infrastructure Master Plan (May 2011), procurement will be done through the different countries.

Table: proposed cases for a full RSS PPP program

Mackinnon road II	**Webuye**	**Mbarara**	**Lira**	**Miritini**
Voi	**Malaba**	**Kabale**	**Elegu**	**Naivasha**
Mtito Andei	**Busitema**	**Maai Mahiu**	**Mpondwe**	**Ishaka**
Nakuru	**Lugazi**	**Korinda Junction**	**Beni**	
Salgaa	**Masaka road**	**Kumi**	**Bunagana**	

9.1.2. STRATEGY 2: ONLY SELECTED FINANCIALLY ROBUST RSS CASES

- If by contrast the scope of the PPP process pursued is oriented only to the very most profitable cases, and network effects are not a crucial element in the RSS strategy, then a recommendation would be to start with the most robust cases, within Group 1
- In that sense, the optimum strategy would be to pursue the process with some specific cases (individually or as a whole group) from Group 1: the ones that better *resisted* the most intense sensitivity test (sensitivity of 25% variation in CAPEX plus 50% variation in OPEX), allowing for risk minimization
- A possible PPP contractual outcome could be that a Private Company *partially finances* (with certain financial contribution from the Government), builds and operates the RSS (or a group). The Private Company can also contract third parties for the construction and certain specific operations in the operation phase
- This strategy also minimizes the complexity of the entire PPP process since it does not target a real and regional extended RSS program
- This strategy could have an additional advantage for countries or regions with a low track record of PPP experiences: it could be an efficient and first *learning process* before considering a further full program strategy such as Strategy 1
- By nature this is a short term RSS PPP strategy (2 – 4 years)

Table: proposed cases for a selective RSS PPP process

Webuye	**Maai Mahiu**	**Kumi**	**Lira**

9.1.3. STRATEGIES FOR GROUP 3 RSS CASES

- With regard to Group 3 RSS, we have maintained in this report that only if theses RSS cases were strategic from a social or political point of view, then project implementation could be justified. But in that case, significant (public) subsidies would be needed at both investment and operational sides.
- An implementation procedure could be that Government builds (through a Contractor) the RSS (or a group) and contracts the Operation to a private Company, or to "third sector"[36].
- Anyhow, we think that due to the complexity of procedure and implementation of the required subsidies within this figure we recommend that development of Group 3 RSS should be very specially supervised and managed by a strong Entity (from an organizational and financial side) like **TTCA-NC** through the *Special Unit Steering Group* itself.

[36] a) Community-based groups; b) Self-help groups; c) Cooperatives; d) Local Authority; e) Chamber of commerce; f) Private Companies based in the environment…

10. CONCLUSIONS AND RECOMMENDATIONS

The development of RSSs will have a very positive effect on the improvement in road safety on the Northern Corridor in East Africa, which will see exponential growth in traffic volumes over the next 25 years. Quite apart from providing long–distance truck drivers with places to rest, eat and sleep, they offer the prospect on integrating the facilities into the surrounding local communities, providing markets for produce, stimulating employment in the rural and raising health standards through access to health care professionals not just targeting AIDS/HIV and other sexually transmitted diseases but also other diseases.

Fundamental to their success, however, is the choice of location, the active involvement of the local communities in the design and operation of these facilities as well as financial and logistical support from public institutions and the international aid community.

Allowing some functions such as vehicle testing, weighbridges and secure warehousing and parking to be located in the area of the RSSs might be a positive step provided the appropriate legal framework can be put in place.

Care must be taken, however, to ensure that any re-location of activities does not conflict with the developmental objectives proposed for the RSSs. The capacity of the RSSs to stimulate local development with a range of social and economic activities should not be compromised.

Financing will need to be provided for the initial construction costs, land acquisition and purchase of relevant equipment. Operating budgets will need to be found for staff and maintenance. Decisions will need to be made on management responsibilities and rates to be charged for rest house/hotel use etc. as well as for services related to health care etc. Ultimately, some form of efficient management structure will need to be put in place to run the RSSs but this needs to involve representatives from the local community since they too will be users of the facilities in many cases especially with respect to market activities.

It would be useful to build on the experiences of the pilot Michinoeki projects developed in Kenya.

Regarding the private finance and PPP possibilities, the main conclusions are:

- PPP processes can be **directly implemented in 30% of the pre-selected RSS cases**. This can be prepared on a case by case basis or by means of RSS packages: 20 RSS would potentially be of interest to private investors, and candidates for a PPP process, and financed without any need in terms of further Public support (funding, subsidy..).
- An **additional 33% of RSS cases could also be developed within PPP** frameworks, although some Public financial support will be required: RSS within this group are potentially profitable and / or bankable but they are not 100% financially sustainable by themselves.
- The remaining **37% of RSS can only be considered by National / Regional specific policies or social constraints, and not according to efficiency considerations**. Such a program would require significant public institutional and legal supports, but also public financial help (support would be needed not only to reach financial profitability levels, but basically to cover at least operational expenses) as well as changes in the contracting structure

The proposed Action Plan for implementing the project will be as follows:

- If the PPP process pursues a **full regional RSS Program** (looking for network effects, a fair presence of all countries alongside the NC..) then a first recommendation would be to start with **RSS within Group 1**. A logical extension would be to include also some selected RSS cases from group 2: the cases more near of bankability levels.

- If the scope of PPP process is oriented only **to pick the most profitable cases** (regardless of network effects, or social developments, local communities..) , then a recommendation would be to start with **the most financially robust cases (**individually or as a whole group) from Group 1[37]:
- If some Group 3 RSS have to become part of a strategy (public subsidies would be needed at both investment and operational sides) we recommend that that process should be supervised and managed by **TTCA-NC** through the *Special Unit Steering Group* itself.

The PPP requirements are:

- The **contracting phase** on the PPP process will still be done in the near future by East Africa NC countries and therefore, according to the different regulatory and legal frameworks ➔ this is a first reason for allowing for promoting, as a first measure, some progress and improving in regional *regulatory harmonization*
- Nevertheless we have detected certain evident progress of the ***Private Sector Investment Promotion Committee*** works, especially with regards to the development of skills in PPP project structuring and procurement as well as best practices and common guidelines on PPP, with a view of further harmonizing PPP policies and common legal frameworks.
- It is strongly recommended the implementation of a **Regional Coordination Unit** within **TTCA-NC** with very clear capabilities and orientations towards the harmonization of criteria and regulatory frameworks, and with the aim of becoming the very interface and coordination figure between the different National PPP Units and the individual projects to be implemented

[37] the ones that better resisted the most intense sensitivity test (sensitivity of 25% variation in CAPEX plus 50% variation in OPEX), allowing for risk minimization

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