INTERGOVERNMENTAL STANDING COMMITTEE ON SHIPPING

REPORT ON THE SURVEY OF THE DAR ES SALAAM TRANSIT AND TRANSPORT CORRIDOR

October, 2022

Table of Contents

List of Figures

List of Tables

List of Abbreviations

ASYCUDA	Automated System for Customs Data
DMGP	Dar es Salaam Maritime Gateway Program
DRC	Democratic Republic of Congo
EAC	East African Community
ICT	Information Communication Technology
ISCOS	Intergovernmental Standing Committee on Shipping
LATRA	Land Transport Regulatory Authority
OGEFREM	Office de Gestion de Fret Multimodal (The Office of Multimodal Freight Management)
OSBP	One Stop Border Post
PPP	Public Private Partnership
PSV	Passenger Service Vehicle
RDA	Road Development Agency
RTSA	Road Transport & Safety Agency
SADC	Southern African Development Community
TANCIS	Tanzania Customs Integrated System
TANROADS	Tanzania National Roads Agency
TANZAM	Tanzania Zambia
TAZAMA	Tanzania Zambia Mafuta
TAZARA	Tanzania Zambia Railway Authority
TICTS	Tanzania International Container Terminal Services
TPA	Tanzania Ports Authority
TRA	Tanzania Revenue Authority
URT	United Republic of Tanzania
USD	United States Dollars
ZABS	Zambia Bureau of Standards
ZipBCC	Zambian Intellectual Property Border Crossing Company
ZMW	Zambian Kwacha
ZRA	Zambia Revenue Authority

1. Introduction

A transport corridor could be defined based on its functions or infrastructural provisions. Modern times require that transport corridors are defined based on both; as an assemblage of transport infrastructure connecting two or more adjoining states, bounded by gateways and providing a suitable conduit for the movement of people and goods.

Across the region, there are several operational and planned transport corridors that include the Northern Corridor, Central Corridor, Dar es Salaam corridor, Walvis Bay corridor, Maputo corridor, LAPSSET corridor, Tanga Corridor, The Dar es Salaam corridor is a multimodal corridor linking the coastal port of Dar es Salaam in Tanzania to Lusaka in Zambia, Kolwezi in the southern part of DRC, Lilongwe in Malawi and Harare in Zimbabwe with some of the key infrastructure including the port, the TAZARA railway line (1,860km), the TANZAM highway (2,400km), TAZAMA oil pipeline (1,710km), Mbeya – Lirongwe road (735km) and the Lusaka – Lubumbashi highway (550km) and other trunk roads in southern DRC, Zambia railways network, Tanzania railways network, Lake Tanganyika transport services (port Mpulungu, Kigoma, Kalemie), Malawi/Nyasa lake services (port Chilumba, Mbamba bay, Chipoka, Nkhata bay, Itungi/Kiwira, Manda).

With the growing appreciation of multimodal transport systems across Africa, different transport modes (water, rail, road, air and pipeline) are being developed into a multimodal system which serve the different routes designated as feeds to the corridor providing the much-needed connectivity which is one of the great measures of corridor performance.

Primarily, the designation of routes as part of a transport corridor is to improve the quality of such routes (measured in terms of transit times and cost of shipment across) and promote both internal, regional and international trade by providing more efficient transport and logistic services. As a system, a transport corridor's reliability is measured by the transit time and flexibility it provides in terms of services' diversity offered on multimodal routes.

This means, all elements of the transport corridor like seaports, railways, roads, inland navigable waterways, pipelines, border crossings, dry ports, roads and support systems ought to function effectively to make the entire corridor efficient. Any bottlenecks within one or more elements has a direct negative effect on the entire corridor as would be manifested in congested ports, costly accidents and incidents across routes, increased transit times and freight costs.

2. Rationale of the Survey

With the foregoing introduction and particularly noting that any inefficiencies in one on more of the corridor elements directly affects the operations of the entire logistics chain including the maritime components like the port operations. This meant that the sustainable elimination of bottlenecks in the shipping and maritime subsector, required proper diagnosis of any constrictions within all interconnecting modes (road, rail, pipeline and maritime) since these modes within the entire corridor are mutually inclusive.

With this understanding, ISCOS planned to conduct surveys of Trade and Transport routes in her Member States in the financial year 2022/23 with the objective of ensuring that challenges to smooth flow of cargo and logistics are identified and solutions sought as well as availing shipping and maritime information on the operations along the routes to stakeholders.

The above informed the survey of the Dar es Salaam Trade and Transport Corridor which was conducted between 21st September to 05th October 2022 with the intentions of identifying corridor opportunities, emerging issues and constraints which when resolved by stakeholders would facilitate smooth trade and logistics along the entire corridor and greatly improve the fluidity of the Dar es Salaam port.

3. Scope

This survey was conducted across part of the Dar es Salaam corridor from the Port of Dar es Salaam through to Lusaka, Kasumulu, Tuduma/Nakonde and Kasumbalesa border crossings involving interviews with selected stakeholders and physical inspections of selected corridor facilities like borders' infrastructure, roadways, weighbridges and dry port facilities. Sections of the Corridor post Lusaka, Kasumbalesa and Kasumulu/Songwe were not wholly covered by this study. Some of the stakeholders interacted with included:

3.1 Tanzania

i. Tanzania Ports Authority – Dar es Salaam port *(port landlord and operator)*;
ii. TAZARA a (railways operator);
iii. Tanzania Revenue Authority – Customs *(Dar es Salaam, Kasumulu and Tunduma Offices)*;
iv. Tanzania Shippers' Council;
v. OGEFREM;
vi. In-Transit Tanzania Drivers' Association *(ITDA)*.

3.2 Zambia

i. Ministry of Transport and Logistics;
ii. Road Development Agency *(RDA)*;
iii. Road Transport & Safety Agency *(Head office and Nakonde office)*;
iv. Zambia Revenue Authority – *Customs, Nakonde Office*;
v. ZAMESCO – *Nakonde Container Terminal*;
vi. Kasumbalesa border crossing.

These activities were conducted by the following ISCOS Officers:

i. Mr. Aderick Kagenzi *(Director Shipping Ports and Freight Services)*;
ii. Ms. Mwanaulu Issa *(Director Trade Facilitation and Policy Harmonisation)*;
iii. Mr. Jonah Mumbya *(Manager Shipping Ports and Freight Services)*;
iv. Mr. Omary Mzuzuri *(Shipping and Freight Logistics Assistant)*;
v. Mr. Richard Chai *(Transport Officer)*.

4. Methodology

The survey utilised a combination of physical observations, interviews and interactions with key stakeholders, physical inspections of facilities and review of relevant documents and involved the physical movement across the entire scope area from Dar es Salaam port to Kasumbalesa and Kasumulu borders.

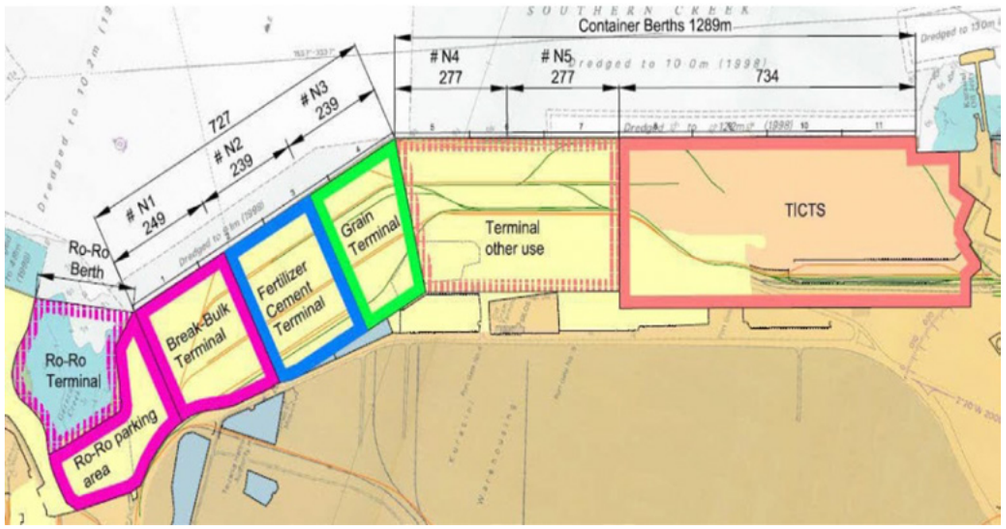
5. Observations and Recommendations

At every point of the survey, several key issues were raised, discussed, and observed majorly highlighting deficiencies across the corridor that required the intervention of stakeholders to resolve for the sole aim of improving the corridor performance and efficiency which would reduce the transit and logistics costs across the corridor as an outcome.

Below were the key issues highlighted during the survey:

5.1 Dar es Salaam Port

Dar es Salaam port owned by the Tanzania Ports Authority (TPA) was the main maritime gateway for the Dar es Salaam transit corridor serving URT, Malawi, Zambia, Zimbabwe and Democratic Republic of Congo in addition to serving other land linked states like Burundi, Rwanda and Uganda through the Central Transit Corridor.



Source: DMGP Report

Figure 1: Dar es Salaam Port Layout

The Dar corridor was so critical to the port given that it was responsible for about 24% of the total port throughput and 70% of the total transit cargo through the port. At the time of the survey the port had a total length of the main quay at 2,600m with six terminals namely:

i. General cargo Terminal: Berths 1-7: break bulk, RoRo and dry bulk (berths 1-4) and containers (berths 5-7). These berths were operated by TPA;
ii. Container Terminal: Berths 8-11 (operated by TICTS on a concession from 2000 till 2025 handling about 70% of all container traffic and covering quay length of 725m with capacity to dock three vessels at once);
iii. Kurasini Oil Jetty (1&2): liquid bulk with capacity to berth tankers of 45,000MT and 5,000MT capacities respectively;
iv. Grain Terminal: Dry bulk, with support facilities like silos of 30,000tons capacity;
v. The Single Point Mooring (SPM) – an offshore crude and refined petroleum facility with capacity to handle 150,000MT vessel;
vi. Passenger terminals: to Zanzibar and other destinations.

The port's cargo offtake was largely dependent on the efficiency of the TAZARA line, the road network and transport services that serve the Dar corridor.

Under the Dar es Salaam Maritime Gateway Program (DMGP), the port was undergoing major expansion and renovations that included the strengthening and deepening of berths 1-7 and 8-11 to 14.5m below datum, deepening and widening the entrance channel and turning basin in the port up to the end of berth 11 to 15.5m below datum, constructing a multi-purpose berth at Gerezani Creek and improving the rail linkages. On completion of these works, the port's capacity was envisioned to increase to 28million tons by 2025 from the current 10million intrinsic capacity (general cargo: 3.1mn tons, containers: 1mn tons and liquid bulk: 6mn tons).

Figure 2: Berth 5-7 with the Mobile Yard Crane Used for handling Containers and General Cargo

All Customs declarations and clearances were done in the Tanzania Customs Integrated System (TANCIS) which was rolled out in 2014 to replace ASYCUDA World. The system had capabilities for pre-arrival declaration that would speedup clearance processes.

With pre-arrival declarations and the integrated single customs system, over 90% of the goods would be cleared within three days of arrival. The other 10% that fell outside the three days were attributed to delays in communication from other parties to the single customs system.

There were nine service providers engaged to provide electronic seals under the TRA Customs guidelines including setting the maximum chargeable amount per seal at TSh63,000 for any providers and allowing shippers to choose their e-seal providers. Each e-seal was also required to have a minimum 80% battery life (which could last at least 7days) before being mounted.

5.1.1 Observations

i) TICTS facilities and equipment were posting better performance with equipment availability reported at more than 80% compared to handling equipment on berths 1-7 which was reported to be around 50-55% availability. There were committed efforts however for TPA to and and/ install new equipment in the short run;
ii) TICTS was operating six modern STS gantry cranes of 45tons capacity and 20 Rubber tyred gantry cranes (RTGCs) in addition to other yard handling equipment while berths 1-7 were utilising mobile harbour cranes which were far slower when handling containers (handling about 15 containers an hour), had very limited reach and lifting capacity;
iii) There were a total of about 137refer plug points with 107 owned by TICTS and 30 by TPA;
iv) Average ships' turnaround time was estimated at 14days verses the targeted 60hours;
v) There was no integrated port community system to manage information sharing amongst key stakeholders like the transport operators, port users, customs and other authorities, customs declarations and responses, cargo releases (between customs and consignees), status information and real time tracking and tracing of goods amongst all interested parties;
vi) TANCIS provided single customs territory capabilities to East African Community members but not SADC members;
vii) All transit containerised and petroleum cargo were moved under an electronic seal mounted and activated at the port till the exit border crossing. While local imports were moved under a manual seal (checked on at designated check points along the corridor). The e-seal providers and TRA could track the sealed cargo throughout its journey but the shipper/consignee didn't have an interface to track their cargo.

5.1.2Recommendations

i) As the port strives to become a modern and competitive port, the Ports Authority needs to fast track the development and deployment of an integrated port community system bringing onboard all key stakeholders to enhance trade facilitation and real-time information sharing;

ii) TPA should optimise its operations to achieve vessels' turnaround time of 60hours targeted by 2025;

iii) Expeditious upgrading of the port handling equipment on berths 1-7 was necessary to improve port efficiencies;

iv) There is need for the implementation of a single customs territory approach between URT and the Republic of Zambia and Malawi to reduce on the requisite customs clearance processes and hence make the port more attractive for the destination countries.

5.2 Tanzania – Zambia Railways Authority (TAZARA)

TAZARA railways is a single track 1,067mm Cape gauge passenger and freight railway line that was opened in 1975 connecting the port of Dar es Salaam (Tanzania) to the town of Kapiri Mposhi (Zambia) about 1,860km in total length. It is owned and operated by the two governments under the TAZARA that was formed in 1976 by Acts of parliament in both Tanzania and Zambia.

At Kapiri Mposhi the line feeds into the Zambia Railway Cape gauge line that connects to Lusaka and Ndola all through to Lubumbashi in DRC.

Initially conceived as a project to provide an alternative for independent Zambia to access the coast for her imports and exports without going through South Africa, Namibia and Rhodesia that were under apartheid. Constructed between 1970 and 1975 at a cost of USD406m (about USD2.83billion in 2022), the line was designed with a capacity of 5million tones a year but only peaked at 1.2million tones in 1987 after which throughput begun to reduce in the 1990s as Namibia gained independence and apartheid rule came to an end opening alternative routes through Beira, Durban and Walvis Bay ports in the south.

Table 1: Shows TAZARA Performance over the years

Fiscal Year	Tonnage of goods conveyed - TAZARA	Tonnage of goods conveyed - Private Operators	Total
2014/2015	87,860	-	87,860
2015/2016	128,106	-	128,106
2016/2017	171,405	-	171,405
2017/2018	220,818	-	220,818
2018/2019	175,597	187,113	362,712
2019/2020	182,302	197,166	379,468
2020/2021	217,661	263,772	481,433
2021/2022	210,161	112,249	322,410
2022/2023*	450,000*	300,000*	750,000*

**Projected throughput*

The line opened with 102 locomotives, 92 stations and three fully equipped maintenance workshops (Dar es Salaam, Mbeya and Mpika) with fully functional communication and signalling system. However, all the locomotives failed in their early operational stages due to very step slopes in some sections of the line. In addition, minimal investment in the line over time, vandalization of the line's signalling system and closure of 17 stations reduced the line's initial design capacity of 5tonnes per year to 2million tonnes per year. By 2014/15 financial year, throughput had dropped to about 88,000tonnes a year, the lowest ever recorded.

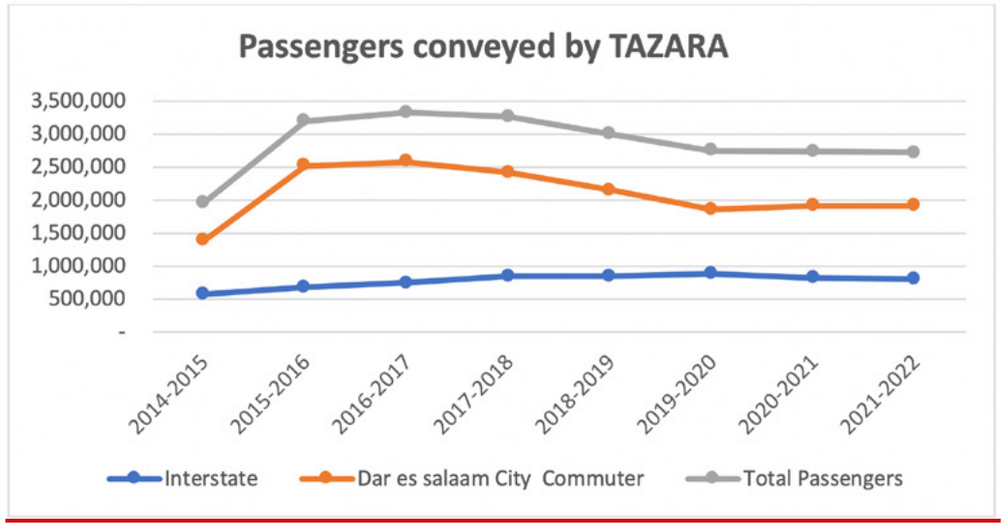


Figure 3: Shows TAZARA Passenger Service Performance

Short term revitalisation initiatives were underway which included the reinstallation of the signalling system, acquisition of additional locomotives and the execution of PPP arrangements for private operators to bring in extra capacity. This was envisioned to increase throughput to 1.2m tonnes a year within five years. Two private operators had already been onboarded and this had helped to grow throughput to above 210,000tones a year since 2000 and expected to grow further with the conclusion of negotiations with the third private player that were in advanced stages.

5.2.1 Observations

The following were observed during the survey:

i) There was more demand for the line than it could carry. It was observed that TAZARA was only carrying about 10% of the corridor cargo with the rest going by road. This was amidst the growing cargo volumes because of the rebounding of mining operation in Zambia that have for example seen sulphur importations growing to between 25,000 and 30,000 tonnes a month (about 330,000tonnes a year). With its explosive nature, it would be desired that all the sulphur be transported by rail;

ii) Out of the 102 locomotives the line started operations with, there were only 12 operational at the time of the survey with four of them being utilised for engineering services;

iii) No new Worksop equipment had been installed in the maintenance workshops of Dar es Salaam, Mbeya and Mpika therefore they had become obsolete to serve the current purpose;

iv) Line downtime was noticed to be quite long especially after an incident which potentially affected reliability. For example, passenger services between Tanzania and Zambia were suspended between 22nd September and 13th October 2022 after a goods train accident occurred at Msanza-Kapwilla area in Nakonde on 22nd September 2022;

v) Feasibility studies for a railway line connecting Mpulungu port to the TAZARA line at Nseluka in Kasama (about 200km) had been conducted. This would provide the much-needed supply line to the port for cargo from Lusaka (1060km away) and Ndola (917km away) for onward shipment to DRC and Burundi across Lake Tanganyika;

vi) PPP arrangements were observed to bring onboard the requisite additional operational capacity greatly needed to increase cargo uptake and delivery from and too the port respectively. This would help the two governments to focus on revamping the infrastructure;

vii) TAZARA being of the Cape gauge allowed traffic from other SADC railway operators like the Spoornet of South Africa, Botswana Railways, Zambia Railways Limited, Namibia Railways, National Railways of Zimbabwe, Mozambique Railways and Societe Nationale Des Chemins De Fer Du Congo Sarl (SNCC) of the DRC to run on its line extending its reach by far.

5.2.2 Recommendations

i) The governments of Tanzania and Zambia need to expeditiously rehabilitate the railway line infrastructure (to reinstate its design capacity and increase rolling speeds), acquire newer rolling stock and reequip the engineering workshops. This would greatly improve the port of Dar es Salaam fluidity and improve the corridor performance and competitiveness;

ii) The government of Zambia should speed up the development of the Mpulungu – Nseluka railway spur that would greatly grow the Mpulungu port throughput (predominantly exports) since it would be more reliable, economical and faster to deliver cargo to the port by rail;

iii) Engagement with the private operators in PPPs needs to be sustained to attract additional rolling capacity on the line. This had since been observed to grow the throughput of the line with TAZARA largely focusing on the maintenance of the permanent way.

5.3 Corridor Main Road Infrastructure

The corridor road network could be divided into three sections for better commentary:

a) Dar es Salaam – Tunduma

This section of about 919km forms a part of the paved trunk roads network in the URT maintained and managed by TANROADS. The road surface condition was largely good with visibly clear road furniture and markings. Some road sections within the Mikumu National Park were under maintenance but wouldn't grossly interrupt traffic flow.

Figure 4: A section of the Dar es Salaam – Tunduma Trunk Road in Morogoro Region

Generally, this section was wide enough with proper hard shoulders save for the 8km section within the high-altitude section between Mbuyuni and Ilula in Morogoro region in which the road was narrow and limited to a speed of 10km/h.

This section was observed to have seven weigh bridges, eight police checks, at least 23 traffic police stops. Rutting was observed between Uyole and Tunduma which slowed traffic. There was no clear railway level crossing signage at safe distance at Inyala which made it risky for road traffic.

There were reported isolated police extortions especially amongst transit vehicles' drivers who would allegedly be asked for bribes when got carrying unauthorised passengers or cargo but would also be reprimanded for not carrying any.

It was observed that as per the Foreign Vehicles Transit Charges Act, 2019; all foreign registered vehicles transiting through Tanzania were tolled. However, to align with COMESA charges and resolve tariff challenges for vehicles from the EAC, the Ministry responsible for Finance through the 2022/23 FY budget reduced the rate for vehicles with at least 3axles from $16 to $10 per 100km as seen int table below:

Table 2: Shows the Toll rates in Tanzania

No.	Category of vehicle	Amount payable
1	Up to but does not exceed 3 axles	US$ 6 or its equivalent in convertible currency or Tanzanian shillings for every 100 Kilometres.
2	Exceeding 3 axles	US$ 10 or its equivalent in convertible currency for every 100 Kilometres.

b) Uyole – Kasumulu

This was a bituminous trunk double lane road of 7.0m width in very good condition with properly road furniture and no hard shoulders. There was one weighbridge (about 500m off the Iringa – Mbeya trunk road) for axle load controls and one regular security check point towards Kasumulu.

Between 50 and 80 transit trucks used this road section daily with varying numbers of transit small vehicles.

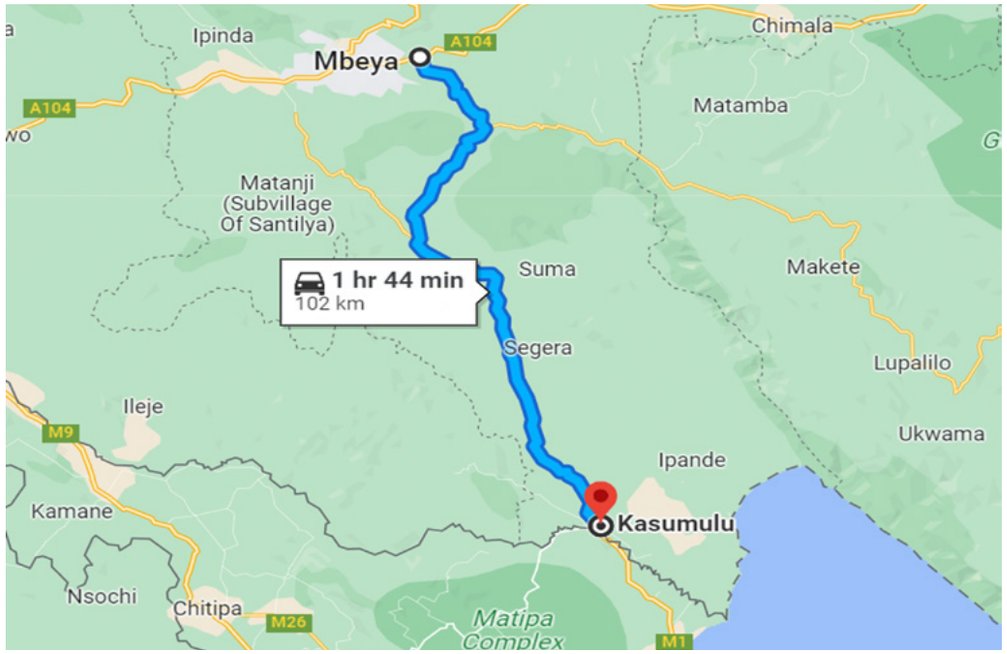


Figure 5: Google Map showing Uyole - Kasumulu route

In Tanzania, TANROADS was responsible for national roads infrastructure development with LATRA being the road safety regulator.

c) Nakonde – Kapiri Mposhi

Nakonde to Kapiri Mposhi is about 818km through Isoka, Chitembo and Mpika with the road surface was largely in fair condition for especially fast-moving traffic at the time of the survey. The road had many sections with damaged pavement with numerous potholes across the entire stretch up to Mpika.

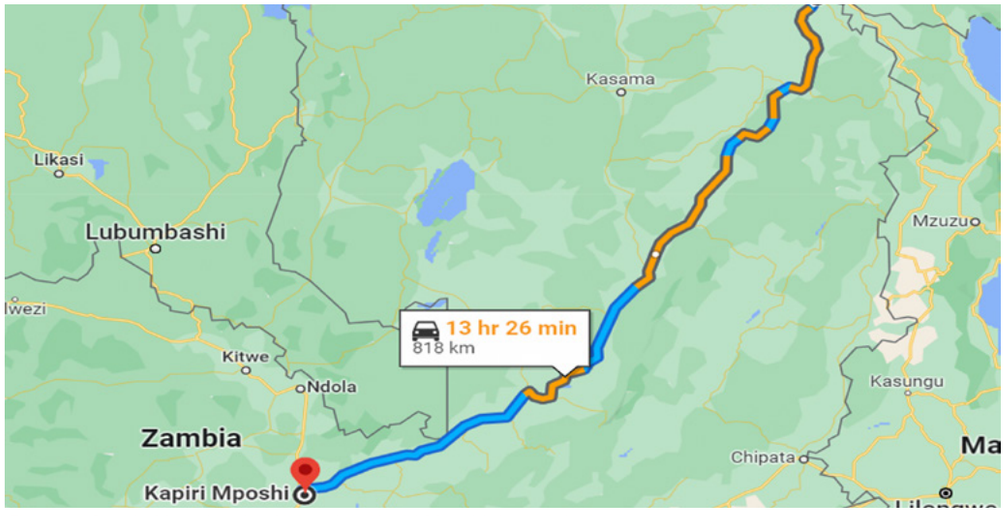


Figure 6: Google Map showing Nakonde - Kapiri Mposhi through Isoka route

The other alternative was the 986km long route through Mbala turnoff, Kasama and Mpika which was in good condition. Serenje to Kapiri Mposhi was in very good condition since its surface had recently been laid over.

Figure 7: Shows One of the Damaged Sections along Mpika – Serenje road with Traffic Creating Bypasses

At least five accidents involving trucks were observed along the Nakonde – Mbala turnoff – Serenje stretch that were attributable to the condition of the road being bad. Due to the high levels of reported accidents on Zambian roads associated with the road condition, RTSA deployed two recovery (tow-away) trucks to help clear accidented vehicles off the road to avoid traffic jams.

It was also noticeable that travel times were far longer than would be due to the limited travel speeds occasioned by the bad road surface between Nakonde and Mpika.

d) Lusaka – Kasumbalesa

The 452km Lusaka – Kasumbalesa section was the busiest route in Zambia with the major traffic composed of cargo trucks. The entire road stretch was evidently affected by the high volume of heavy trucks with rutting in many sections especially between Lusaka and Ndola. The road Lusaka – Ndola and Chingola – Kasumbalesa road sections were generally in fair condition with the Ndola – Chingola section being in very good condition.

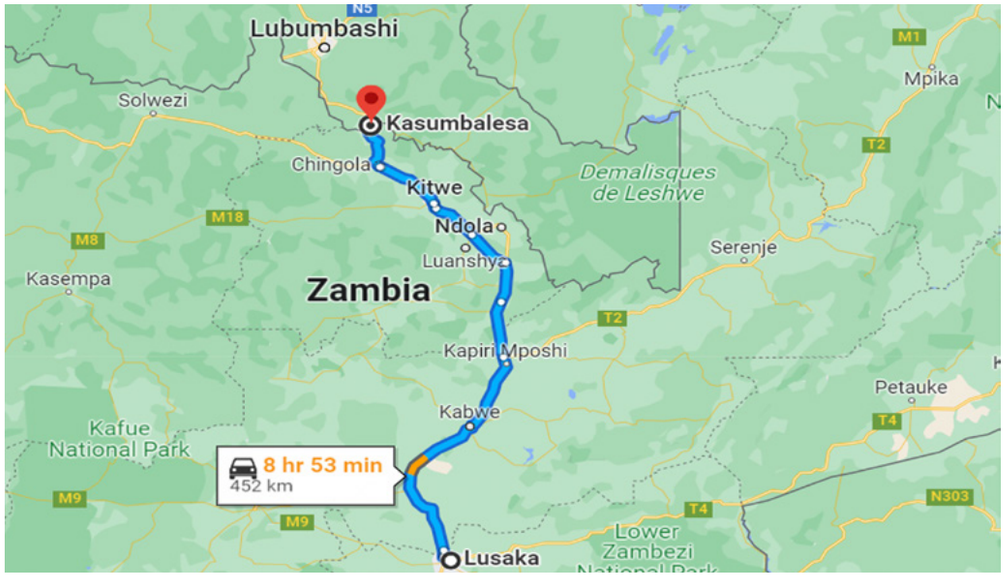


Figure 8: Google Map showing the Lusaka - Tunduma route

It was observed that all national roads were tolled (and over 37 border/entry points) as provided for in the Tolls Act, 2011. The toll fee or other charge imposed for the use of a toll road contributed to the Road Fund and would exclusively be used for the construction, maintenance and rehabilitation of roads.

There were two types of tolls as provided for in the Tolls Regulations, 2013 as amended specifying the toll amounts for the different classes and categories of vehicles using Zambia national roads as shown below:

i) **Entry toll:** Levied on foreign registered vehicles entering or transiting through Zambia. This was being collected at 38 designated toll points (border posts, ports of entry, roads) as per the following schedule set by the Tolls Regulations, 2013 as amended:

Table 3: Toll Rates Applicable on Zambian Roads for Foreign Registered Vehicles

	Charge method Per distance/fixed	Rates per trip (USD)	
		Return	Single
Toll on COMESA/SADC registered vehicles			
Buses	100km	10	5
Rigid vehicles up to 3axles	100km	12	6
Vehicles with multiple axles	100km	20	10
Private small vehicles	Fixed	20	10
Tanzania registered vehicles (on reciprocal basis)			
2 axles	100km	12	6

3 axles	100km	20	10
4 axles	100km	32	16
Small vehicles	Fixed	30	15
Buses	Fixed	160	80
DRC registered vehicles (on reciprocal basis)			
Truck Inland	Fixed	900	450
Truck cross country	Fixed	1000	500
Light truck (1.5-4.9tons) inland	Fixed	150	150
Light truck (1.5-4.9tons) cross country	Fixed	200	200
Light truck (5-10tons) inland	Fixed	400	300
Light truck (5-10tons) cross country	Fixed	600	400
25–34 seater bus inland	Fixed	100	100
25-34 seater bus cross country	Fixed	200	200
35 and above seater bus inland	Fixed	250	200
35 and above seater bus cross country	Fixed	300	300
Small min up to 24 seater bus and vannette of below 1.5tons inland	Fixed	50	50
Small min up to 24 seater bus and vannette of below 1.5tons cross country	Fixed	80	80
Small vehicle inland	Fixed	20	20
Small vehicle cross country	Fixed	40	40

ii) **Road usage/per distance toll:** These were inland tolls levied on any vehicles (apart from the exempted categories) using Zambian roads each time they go through a designated toll gate. There were 52 designated toll gates in the country as set out by the Tolls Regulations, 2013 as amended and below were the set rates per passage through the toll gate:

Table 4: Toll Rates Applicable on Zambian Roads for Local Vehicles

Zambian and foreign registered vehicle Road toll tariff structure – inland toll gates		
Category for unladen weight of vehicles and weight (gross vehicle mass) kg	Charge method	Toll fee (ZMW)
small vehicle (up to 3.5tons) (including car, can and minibus up to 16 seats) (single access)	Fixed	20
Light vehicle with 2 axles including minibus (more than 3.5tons to 6.5tons) (17-30seats) (single access)	Fixed	40
Medium heavy vehicle with 2-3 axles(rigid) including bus above 30 seats(more than 6.5tons) (single access)	Fixed	50
Heavy vehicle with 4axles and above (single access)	Fixed	150
Abnormal load vehicle (single access)	Fixed	500

RTSA was responsible for traffic management and road safety regulation while the road infrastructure development was under the RDA.

5.3.1 Observations

i) Tanzania, Zambia and DRC all tolled their roads at $16 per 100km, $10 per 100km and 1,000 for each entry for trucks of more than three axles respectively;

ii) Axle load and vehicle dimensions limits varied especially between Tanzania and Zambia with the Tanzania largely basing on the EAC Axle load laws while Zambia applied SADC rules;

iii) The corridor road network in Zambia was largely not in the best condition which limited travel speeds, caused numerous costly vehicle breakdowns accidents. This had a direct effect on the cost of transport and logistics across the entire corridor;

iv) Any Zambian PSV to operate on Tanzanian roads needed a road service permit which would only be issued after the vehicle was inspected. The only inspection centre was in Dar es Salaam. This was reported as a technical lockout for Zambian PSV operators to access the Tanzanian market.

5.3.2 Recommendations

i) There is need to review the tolling policies with the aim of reducing tariff barriers across the corridor;

ii) Corridor states needed to expedited the harmonisation of axle load regulations and vehicle dimensions' regulations;

iii) Tanzania needed to facilitate the inspection of Zambian PSVs seeking to apply for road service permits. This would ease cross border movements to/from both states;

iv) Zambia to expedite the reconstruction of Nakonde – Isoka – Chinsali – Mpika road and the proposed development of Lwampula bridge that would connect Zambia to Lubumbashi through Kasomena/Mwenda which would reduce the current route distance by about 300km between Nakonde and Lubumbashi. These interventions would lower transit costs and ease traffic congestion at Kasumbalesa border crossing;

v) RDA should resurface and expand the Kasumbalesa border access roads.

5.4 Weighbridges

Road pavement failure rate is directly related to the axle loads carried over the pavement; therefore, in a bid to control the rate of road failure, many national roads agencies in the region have deployed weighbridges to check on excessive loads. These come in different sizes, measurement configurations and technologies which therefore limit the type of loads and vehicle configuration that could be weighed by each.

There are four weighbridge types in principle that could be operated with differing operational technologies, either static or dynamic/weigh in motion:

i) **Portable scales:** These measure individual wheels, axles, axle units and vehicle/combination mass (depending on set installation combination), are relatively light and easy to set up anywhere on a relatively flat surface and give relatively accurate readings. They can be used either statically or weigh in motion and are preferably used for screening purposes and not advisable to be used for law enforcement.

ii) **Single axle scale:** Commonly referred to as first generation weigh scales having decks of dimensions 3.2m width by 1m length capable of weighing individual axles at a time. These much as are cheaper to install, they are laborious and time consuming to operate and difficult to capture loads for combination axles with more inaccurate readings that could lead to costly litigations.

iii) **Single deck or axle unit scales:** These are usually 3.2m (width) by 4m (length) single solid deck capable of weighing up to 40tons used to way individual axles or axle groups at a time typically useful when traffic volume is less than 500vehicles per day. Individual axle and axle group weights are then summed (manually or automatically) to generate the gross vehicle weight. They are relatively cheaper to install and operate compared to the multideck and provide simple and quick verification.

iv) **Multideck weighbridge:** This type consists of more than one deck normally consisting four individual decks units with lengths typically of 3m, 6m, 7m and 6m, respectively giving an overall length of 22m with a standard width of 3.2m. Each individual deck normally has the capacity to weigh 40tons and given their installation and operational costs, multi-deck weighbridges would be warranted by traffic of at least 500vehicles a day. Configuration would have axle groups of both truck and trailer displayed on separate indicator screens with another providing a summing indicator.

Multi-decks provide quicker weighing with very accurate results of over 99% especially when operated in static mode and they are more difficult to manipulate.

The different weighing methods (static and weigh in motion) present different attributes and benefits as summarised below:

Table 5: Shows the different Weighbridge Types

	Fixed Weigh Bridge • Easy to operate • Fewer personnel • High costs of installation	Mobile Weigh Bridge • Have wide coverage • Have high operating costs and prone to equipment damage • Need security • Disruptive to general traffic
Static weighing • More precision • Acceptable for litigation • Slower especially single axle types	i) Easy to operate ii) Can weigh and register axle units iii) Provides the highest precision levels	i) Lowest investment ii) Optimal for enforcement check/ screening
Weigh in Motion • Rapid monitoring • Not generally acceptable for enforcement/litigation • Lower precision	i) They are faster for monitoring ii) Require large installation iii) Direction of vehicles needs great care	i) Minimum disruptions of commercial traffic ii) Very good for statistical monitoring iii) Lowest accuracy

Across the surveyed route, it was noticed that there were eight weigh bridge stations (Kurasini, Vigwaza, Mikese, Mikumi, Tanangozi, Makambako, Uyole and Mpemba) in Tanzania (Dar es Salaam – Kasumulu – Tunduma) and three (Mpika, Kapiri Mposhi and Kafulafuta) in Zambia (Nakonde – Lusaka and Kapiri Mposi – Kasumbalesa) however, the following were surveyed.

Under the 2022 Road Sector Annual Work Plan, Zambia planned to install two additional weighbridges along the corridor with one at Nakonde (under the rehabilitation of Nakonde – Isoka – Chinsali road project) and another between Chingola and Kasumbalesa (under the Kapiri Mposhi – Ndola road rehabilitation project).

a) Mikese Weighbridge

Mikese was about 165km from Dar es Salaam had two weighbridges; Mikese 1 (for traffic from Dar es Salaam) and Mikese 2 (for traffic to Dar es Salaam) installed on either sides of the road respectively. There were sufficient lay-bys leading into the weigh stations that allowed traffic for weighing to get off the main road sections to avoid jamming general traffic.

Figure 9: Google map showing Mikese weighbridge

Mikese 1 had a fixed single deck weigh-in-motion weigh bridge (weighing at 5-10km/h with only non-compliant vehicles stopped) with holding area of about 1,500m2 for non-compliant vehicles while Mikese 2 operated a single deck static weigh bridge. The combination of operating a weigh in motion weigh bridge, having adequate lay-bys and holding area ensured that there was no traffic jam at the weigh station.

b) Mikumi Weighbridge

This weighbridge station was found within the Mikimu National Park around 300km from Dar es Salaam installed with a single deck fixed and static weigh bridge. About 550m east of the weighbridge, there were lay-bys on both sides of the road measuring about 650m on each side.

Figure 10: Google map showing Mikumi weighbridge

These were useful for truck drivers to rest but also helped regulate traffic flow of trucks from the Dar es Salaam direction which ensured no congestion at the weighbridge. However, due to the weighbridge being located on side of the road, there was traffic congestion stretching about 700m from the weigh station largely caused by right turning vehicles accessing the weighbridge.

Figure 11: Congested approach to Mikumi weighbridge

The station had a holding area of about 3,000m^2 capable of holding up to 50 noncompliant vehicles at once to verify their axle load compliance.

c) Tanangozi Weighbridge

Found in Iringa region at Wenda, the Tanangozi weigh station had two fixed, single deck and static weighbridges one on each side of the road. The station had two lay-bys were about 400m long on both sides of the road with about 3,300m^2 of paved holding/parking space for non-complying vehicles on each side.

No major issues were reported at this weighbridge during the survey and there was free flow of traffic with each vehicle taking about two minutes to exit the weigh station from the time it lands on the weighbridge.

Figure 12: Google map showing Tanangozi weighbridge

d) Mpemba Weighbridge

Mbemba weighbridge station was located 10km from Tunduma border crossing installed with a fixed single deck static weighbridge. The station had one weighbridge installed on the side towards Tunduma having a holding area of about 6,200m^2 and a combined lay-by length on both sides of about 700m.
Vehicles from the border had to cross the road to access the weighbridge sometimes holding back other traffic for considerable times.

Figure 13: Google map showing Mpemba weighbridge

e) Kapiri Mposhi Weighbridge

Kapiri Mposhi weigh station was located at the junction of Serenje – Kapiri Mposi road and Kabwe – Ndola Roadon the left side of the Kabwe – Ndola road. It had a fixed, static and multideck weighbridge installed. It had an advance lay-by of about 200m from the Kabwe direction with sufficient circulation and holding areas for vehicles with questionable axle loads.

There was noticeable traffic jam around the junction partly caused by traffic from Ndola making a right turn to enter the weigh station and traffic from Serenje crossing the main Kabwe – Ndola road to enter the weigh station.

Figure 14: Google map showing Kapiri Mposhi weighbridge

f) Kafulafuta weighbridge

Kafulafuta was a fixed, static single deck weighbridge located at Masaiti between Kapiri Mposi and Ndola, about 79km from Kapiri Mposhi in Zambia. The weigh station was off the main trunk but didn't have an entrance lay-by off the 7.5m standard two lane busy highway which predominantly causes queuing back into the road which causes massive traffic jams to general traffic.

Figure 15: Google map showing Kafulafuta weighbridge

There was a small holding area of about 900m^2 at the exit of the station for vehicles with pending issues to sort with the station. The location and size of the holding area was seen to be obstructive to traffic exiting the station.

5.4.1 Observations

i) There were generally compliances both in Tanzania and Zambia of over 97% of axle limits especially among transit cargo with most of the noncompliance registered amongst local trucks. Transit trucks that were non-compliant were largely due to cargo shifting due to uneven road surfaces in some parts along the corridor route;

ii) Majority of the weighbridges surveyed in Tanzania and all in Zambia were of static type which were much slower in operation;

iii) Weighbridges constructed on one side of the road was observed to be obstructive to general traffic as vehicles made turns to access weighbridges on the opposite side of the road. This raised safety issues in addition to causing delays due to congestion and intermittent blockages of the road as vehicles crossed towards weighbridges;

iv) Both Tanzania and Zambia had same gross vehicle weight limit for combination vehicles of 56tons with the steering/single tyre axle limit at 8tons with double tyre axles at 10tons. There was a 5% permissible variation on the gross vehicle load limit;

v) There were differences observed in the vehicle dimensions between Tanzania (as per East African Community Vehicle Load Control Act, 2016) and Zambia (as per the Public Roads Act, 2002 and the Public Roads (Maximum Weight of Vehicles) Regulations, 2007) as indicated (in meters) below:

Table 6: Shows Limits of Vehicle Dimensions in Tanzania and Zambia

	Max. overall length			Maximum vehicle width	Maximum vehicle height
	Rigid body	Articulated	Combination		
Tanzania	12.5	17.4	22	2.65	4.3
Zambia	13.5	18.5	22	2.6	4.8

vi) Standard practice requires that fixed weighbridges are under a roofed structure to protect them from adverse environment and minimise mal-functionalities of the electronic systems. However, all surveyed weighbridges were observed to have no roofed structures over them.

5.4.2 Recommendations

The study recommends:

i) Tanzania and Zambia to expedite the harmonisation of permissible vehicle dimensions and attributes to eliminate discriminatory limitations;

ii) The installation of weighbridges on both sides of the road at a weigh station to avoid right U-turns to access the weighbridge on the opposite side of the road especially at busy stations handling over 1,000 vehicles a day like Kapiri Mposhi and Kafulafuta which are found on a trunk road with an Annual Average Daily Traffic (AADT) of between 3,000 – 5,000 majority of which are trucks;

iii) Replace all single deck weighbridges with multideck ones (preferably with weigh in motion capabilities) at stations where the daily registered traffic was above 500 vehicles. This was the case with all surveyed stations.

5.5 Kasumulu Border Crossing

Kasumulu border crossing is a transit connection between Tanzania and Malawi about 100km from Uyole in Mbeya region. The border was conceived by the two countries to operate as a One Stop Border Post (OSBP) in which the functions of the two stops on either side are consolidated under one roof on either sides such that people and cargo only stop once and all requisite border clearances for the two countries are done under one roof using integrated systems. The intention of this is to shorten the clearance processes at the border therefore facilitating more cross border trade and movement.

By the time of the survey, Tanzania had progressed with the construction of the OSBP facility (including the installation of a container scanner, cargo inspection and destuffing areas, passenger and truck clearance terminals) with completion timelines set for December 2022 yet Malawi was reportedly still acquiring land.

Figure 16: OSBP Under Construction on Tanzanian Side Kasumulu Border at 98% Completion

TRA disarmament of the E-seals on transhipment cargo would be done at the border crossing after a physical inspection and exit clearance had been granted.

Figure 17: Disarmed E-Seals at Kasumulu border crossing

5.5.1 Observations

It was observed that:

i) Transit trucks were congested on the Tanzanian side with dwell times ranging between 24hours and several days. This was because there was not parking space on the Malawian side therefore even after clearing with Tanzania, drivers left trucks on the Tanzanian side until clearance with Malawi was completed before crossing the border;

ii) There was no system integration between Tanzania and Malawi with the later largely applying manual processes that were significantly slower;

iii) Transhipment cargo to Malawi was cleared before reaching the border therefore, cargo inspections and disarming of the E-Seals would be done at the border and truck would be cleared to proceed. Incoming transhipment cargo from Malawi would only be armed with E-Seals, inspected and cleated to proceed, these processes were observed to take less than an hour;

iv) There was no container scanner on the Tanzanian side with Malawi having one and integration of the two Customs systems was underway with trials targeted to start running in October 2022.

5.5.2 Recommendations

i) Malawi to expedite the construction of OSBP facilities to complement what Tanzania was putting in place;

ii) The two Customs clearance systems needed to speak to each other to speedup clearance procedures therefore integration efforts needed to be expedited.

5.6 Tunduma/Nakonde border crossing

The conception of Tunduma/Nakonde border crossing was to operate as an OSBP requiring a single stop in the entry country for people, goods and vehicles where all requisite controls, checks and procedures for the adjoining states are performed after which one exits one country and enters another. Sound OSBP operations are hinged on four main pillar which:

i) **Legal and Institutional Framework:** National laws are normally limited to national jurisdiction therefore there is need to embrace bilateral legal arrangements to have the laws of the adjoining states closely work to facilitate OSBP operations. There's also need to nominate the lead agency of the OSBP.

ii) **Harmonization of procedures:** There is need to simplify and harmonise of border crossing and customs clearance procedures for OSBP to be implemented effectively.

iii) **Systems integration and data exchange:** For clearances to be quickly done under one roof, there is need for clearance systems of adjoining states to speak to each other and exchange prescribed information/data about the persons, cargo and vehicles crossing the border. A single window system comes in handy to address this where documentation is simplified, each involved party is able to share/access common information required for customs, immigration, and related services' approvals.

iv) **Infrastructure:** An effective OSBP requires physical infrastructure such as offices, warehousing, parking, support equipment like scanner and access roads mirroring each other on both sides of the border.

During the survey, it was noted that the OSBP concept was being implemented but with some limitations noted on both sides of the border:

5.6.1 Observations at Tunduma – Tanzania

i) TRA received and processed all cargo trucks and vehicles from Zambia 24/7 with a few that had pending customs issues held at designated customs areas in Mpemba. There was also space capable of holding up to 100 trucks/buses and over 50 small vehicle as they were being processed through the border;

ii) Both exiting and entering traffic had different roads which helped reduced potential traffic congestion;

Figure 18: Google map showing Tunduma OSBP with Parking Yards Highlighted

iii) TRA was installing an in-motion scanner targeted to be completed by end of the first quarter of 2023;

iv) With the pre-arrival clearance being utilised, transit cargo is just visually checked, E-seal disarmed and exited which saves a lot of time;

v) Cargo from Dar es Salaam through Tunduma had been set to exit within 3days but due to the limitations at the OSBP, this was extended to 7days by TRA.

5.6.2 Observations at Nakonde – Zambia

i) ZRA could only process container trucks between 0800hrs – 2000hrs with the rest of the cargo received at night save for explosive cargo that would be given priority. This meant that the rest of the trucks had to be held at Mpemba, Tanzania till they were called upon;

ii) There was no holding area for vehicles as clearance was being done, this caused unnecessary traffic jam at the border with a designated parking for trucks located 10km away;

iii) Both passengers and trucks were being cleared in the same facility which caused human congestion and confusion;

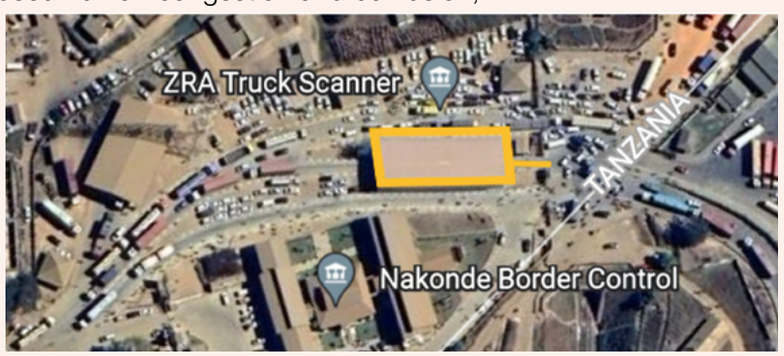


Figure 19: Google map showing Nakonde OSBP with Container Scanner Highlighted showing how close it was to the main road

iv) Both incoming and outgoing trucks and vehicles under customs (imports, exports and transhipments) used the same road which caused traffic congestion;

v) ZRA's ASYCUDA World customs system was partially integrated with TANCIS but couldn't read some vital documents from TANCIS;

vi) Single window system was being implemented that helped all national agencies (ZABs, RTSA, Immigration, Radiation agency) involved in border crossing to communicate, view and exchange information amongst each other to quicken clearances;

vii) All Zambian bound containers were scanned with transit ones sampled. The scanner could only handle about 70 containers a day yet around 300container trucks arrive on average. The scanner being located too close to the entrance paused a bottle neck to traffic flow. This meant that ZRA couldn't receive all trucks as they came in forcing TRA to hold them at designated areas in Mpemba;

viii) Most of the clearances were initiated when the trucks arrived at the border. Pre-arrival clearance seemed not quite popular amongst clearing agents. This caused delays, made ZRA look understaffed at the border and was prone to encourage corrupt tendencies;

ix) If all documents were in order, cargo clearance would take 2-3days to be complete. This was quite high and imposed huge costs to logistics;

x) There was planned relocation of the scanner as part of the proposed development of the Nakonde – Isoka – Chinsali road that would also construct border post roads into Zambia;

xi) Office infrastructure was visibly limited with huge congestions at customs and RTSA offices being a common occurrence.

5.6.3 Recommendations

The study therefore recommends that:

i) Zambia needs to expedite the development of OSBP supportive infrastructure like roads (different for entry and exit traffic), extra office spaces, parking areas, inspection parlours and relocation of customs scanner;

ii) The two customs agencies need to complete the systems' integration to facilitate quicker processing times through the border;

iii) Adoption and enforcement of pre-arrival clearance by ZRA needed to be rolled out as it would significantly reduced customs clearance times at the border from 2-3days to within a few hours;

iv) ZRA needed to consider the implementation of E-seals system especially for transit cargo. This would reduce the need for scanning containers at Nakonde;

5.7 Kasumbalesa Border Crossing – Zambia

Kasumbalesa border crossing connected Zambia and DRC providing the busiest crossing between the two countries processing over 600 vehicles each day across. The border crossing was not managed as an OSBP therefore both countries had customs and immigration offices in their respective territories.

Figure 20: Google Map showing the Border facilities under ZipBCC

On the Zambian side, border infrastructure (office spaces, parking and associated road infrastructure from the gates, installation of ICT equipment) were constructed by ZipBCC under a Design, Build Operate and Transfer arrangement granted by the government of Zambia. Construction of the border post was completed and operations launched in March 2011. Traffic management within the border crossing facilities was also under ZipBCC.

Figure 21: Survey Team Interacting with some Truck Drivers at Kasumbalesa

5.7.1 Observations

During the survey, it was observed that:

i) There was reportedly no bilateral arrangement between Zambia and DRC for the implementation of an OSBP at the border whose absence was causing visible inefficiencies at the border;

ii) All Zambian border control offices (ZRA, Immigration, ZABS, RTSA) were at the facility. Congestion was very visible in the offices which indicated a fragmented approach to border clearances;

iii) Clearance through the border could take over 7days for ordinary cargo while dangerous/explosive cargo like ammonia was given priority taking about 3-4days;

iv) There was parking for over 500trucks and vehicles but still seemed insufficient going by the number of trucks that were waiting to access the border premises. Parking was free for the first 3days after which each day was charged $25. ZipBCC also charged $100 and $25 per truck and small vehicle respectively for each border crossing;

v) It would take an average of 60days to make a round trip from Dar es Salaam to Kolwezi – DRC and back with Dar es Salaam to Kasumbalesa taking about 8days and the rest in DRC. Documentation for exiting DRC seemed to be delayed deliberately to give ground for corruption tendencies;

vi) Entry visas were required into DRC costing $50 for Zambian drivers which was sighted as quite high;

vii) Traffic management on the access road (about 2.5km from Chililabombwe direction) to the border crossing was chaotic with traffic in both directions using the same narrow and largely uneven road section causing hefty dreadlocks. Approaching traffic from Chililabombwe would stretch to over 10km;

viii) The security situation in DRC was reported to be so volatile with many cases of armed robberies and killings of truck drivers. Drivers reported that bodies of colleagues who get killed in DRC would not be released until about $250,000 was paid. About four drivers had been reported as killed in DRC in September 2022.

5.7.2 Recommendations

i) Zambia and DRC to consider the implementation of an OSBP at Kasumbalesa as it would solve the prevailing inefficiencies and speed up customs and immigration clearance processes;

ii) Border road infrastructure needed to be improved and imbedded with better traffic management mechanisms like road dualling to separate incoming from exiting traffic;

iii) Implementation of a Single window system at the border point would drastically reduce the time taken to clear goods and persons through the border by having all Zambian government entities view and review applications and grant approvals in the same system;

iv) Customs' systems integration was necessary as it would drastically cut down the time taken for customs clearance through the border;

v) A bilateral approach was necessary to address the numerously reported fatal attacks on especially foreign truck drivers while in DRC;

vi) Zambia and DRC should consider the construction of another border crossing to relieve some pressure from Kasumbalesa. The Lubumbashi through Kasomena/Mwenda option (Luapula bridge) should be expedited with an OSBP arrangement at the border crossing;

vii) The DRC government needed to secure the route from Kasumbalesa to Lubumbashi as insecurity had been highlighted as a major cause of delays.

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