

A Regional Analytical Analysis of Trends in Trade and Transport in East Africa

Executive summary

This report documents the results of the Regional Analytical Analysis of Trends in Trade and Transport in East Africa (RAATTE) study, TradeMark East Africa's (TMEA's) first East Africa-wide survey of traffic and trade trends across the region. The RAATTE study establishes a data collection process, an analysis of trade volumes, an emissions inventory, an assessment of transport costs, and the baseline dataset for use in TMEA's trade facilitation intervention impact assessment efforts.

Implemented by Kenya-based Africa Economic and Social Development Consultants (AESDC), with the support COWI A/S (COWI), this RAATTE study has collected data to report against the following parameters:

- Traffic volumes across the East African trade network and on each of the two major trade corridors (Northern Corridor and Central Corridor).
- The predominant origins and destinations of freight across the network.
- Total cost of transport by country at the commodity level.
- Inventory of the emissions production from goods movement across the region.

Summary of Key Cost and Time Findings of the Study

The total cost of trade across East Africa, inclusive of direct transport costs, port costs, illicit costs, compliance costs and delay costs, but excluding shipping line costs is estimated to be:

Country	Average total cost of trade (USD)
Burundi	4,277 ¹
Kenya	2,364
Rwanda	5,419 ²
Tanzania	5,260
Uganda	3,320
Northern Corridor	3,065
Central Corridor	4,883

Naturally, the costs vary substantially by route, given differences in distances and times travelled. The top 20 most frequently used routes are estimated to have the following costs:

No	Origin	Destination	Road distance (km)	Trade Cost		Median reported trip times (days)
				Average cost per trip (USD)	Average cost per km (USD/km)	
1	Mombasa	Kampala	1,169.0	2,779.9	2.4	3.0
2	Dar es Salaam	Kigali	1,495.0	4,907.6	3.3	4.2

3	Dar es Salaam	Mwanza	1,152.0	4,547.7	3.9	2.1
4	Mombasa	Nairobi	485.0	2,916.0	6.0	0.9
5	Mtwara	Dar es Salaam	556.0	4,876.8	8.8	1.3
6	Mombasa	Juba	1,620.0	2,916.0	1.8	3.3
7	Kampala	Juba	635.0	2,916.0	4.6	2.3
8	Kampala	Mombasa	1,138.0	2,916.0	2.6	2.4
9	Nairobi	Kampala	657.0	2,916.0	4.4	2.0
10	Kampala	Arua	475.0	2,916.0	6.1	0.4
11	Dar es Salaam	Bujumbura	1,494.0	4,876.8	3.3	3.5
12	Bagamoyo	Dar es Salaam	63.0	2,916.0	46.3	0.2
13	Arusha	Dar es Salaam	624.0	4,876.8	7.8	1.3
14	Dar es Salaam	Arusha	624.0	4,876.8	7.8	1.2
15	Tanga	Dar es Salaam	332.0	4,547.7	13.7	1.0
16	Mombasa	Jinja	1,070.0	2,896.6	2.7	2.7
17	Dar es Salaam	Kigoma	1,479.0	4,876.8	3.3	2.6
18	Mbeya	Dar es Salaam	815.0	4,876.8	6.0	1.3
19	Dar es Salaam	Mbeya	815.0	4,876.8	6.0	1.4
20	Mombasa	Kigali	1,477.0	2,916.0	2.0	4.2

Methodology for the Study

The study team employed a mixed methodology approach in collecting data required for this study and the tools employed included the following:

- Freight Origin and Destination (OD) Survey.
- Traffic Census.
- Freight Transport Cost Survey.

All study tools were tested using a pilot process. The pilot utilized an “iterative process” which enabled the team to improve the tool’s design diligently and quickly mobilize for the Full Study.

Sample Size

The baseline OD survey managed to reach the target sample size with where the response rate is the proportion of the anticipated sample successfully collected. The results of the OD Survey collection are as follows:

Country	Target Sample (n)	Sample size (n)	Number of stations covered ³	Sample/Target
Burundi	372	281	1	76%
Kenya	3,348	5,109	9	153%
Rwanda	744	600	2	81%
Tanzania	3,348	4,736	9	142%
Uganda	2,976	4,459	8	150%
Total	10,788	15,185	29	141%

Traffic Census

A purpose-built web-based Digital Traffic Census (DTC) application was used to collect vehicular traffic on both sides of the road at the selected traffic survey sites. These were supplemented by manual paper census taking to ensure continuity in case of internet access failures. The survey sites were located at high-volume sites in each East African Community (EAC) country. They were selected to subject the methods, tools and research instruments to their maximum stress limits.

The Traffic Census involved counting 100% of the vehicles passing the census traffic count sites, including all types of freight vehicles. The Traffic Census was conducted for twelve (12) hours over seven days for a continuous seven (7) days period, and also included full 24-hour counts for two of the days of each counting period. The national police services were incorporated into each country team and their primary role was to facilitate the traffic census and provide security to the study team. A total regional average daily traffic (ADT) of 343,963 vehicles were counted, of which Kenyan traffic accounted for just under 50%. Overall, freight accounted for about 28% of total traffic on the road during the census period.

Freight Origin/Destination Survey

The purpose of the OD Survey was to establish the physical and operational characteristics of traffic flows in terms of, among others, the following particulars: vehicle, owner, driver, headquarters of operation, cargo, journey, fuel consumption, and unofficial payments. The surveys were conducted during the entirety of each census period. The OD Survey was conducted at the same sites as the Traffic Census Survey.

The results obtained from the OD Survey support the estimation of both traffic flows and transport costs for this study.

³Station count numbers and locations as agreed with TMEA.

The top freight routes by traffic volumes are reflected in the following table:

Rank ⁴	Regional	Burundi	Kenya	Rwanda	Tanzania	Uganda
1	Mombasa-Kampala	Dar es Salaam-Bujumbura	Mombasa-Kampala	Dar es Salaam-Kigali	Dar es Salaam-Mwanza	Mombasa-Kampala
2	Dar es Salaam-Kigali	Bujumbura-Dar es Salaam	Mombasa-Athi River	Dar es Salaam-Gisenyi	Mtwara-Dar es Salaam	Kampala-Juba
3	Dar es Salaam-Mwanza	Kampala-Bujumbura	Nairobi-Kampala	Mombasa-Kigali	Bagamoyo-Dar es Salaam	Kampala-Arua
4	Mombasa-Nairobi	Gitega-Bujumbura	Nairobi-Mombasa	Nairobi-Kigali	Arusha-Dar es Salaam	Kampala-Gulu
5	Mtwara-Dar es Salaam	Arua City-Bujumbura	Mombasa-Kisumu	Dar es Salaam-Cyangugu	Dar es Salaam-Kigali	Mombasa-Juba

Transport Cost Survey of Freight Transport Operators

The Freight Transport Cost Analysis Survey focused on collecting information from freight transport fleet operators on the principal drivers of cost in terms of transport prices and transport costs from various freight transport and logistic companies. Following the experience of the Pilot Study, the Cost Analysis Survey was simplified, in order to attract a more robust response. This was only partially successful as we collected 83 responses, which was significantly higher than the pilot volume, but well below our target of 250. Information collected from the survey was collated as follows:

List of Freight Transport Operators, Commodities Selected for Discussion, Type of Trucks used to Transport Selected Commodities, Principal Commodity Origin and Destinations, Commodity Packaging, Transport Charges of Transporting the Goods from Origin to Destination, Typical Informal Charges and Transport Cost Build-Up Model.

Our analysis indicates the following in-East African Community (EAC) average total costs per twenty-foot equivalent unit (TEU) trip. The regional average cost by trade corridor in terms of the Northern Corridor and Central Corridor is as follows:

Item	Northern Corridor	Central Corridor
Average direct transport cost per trip (USD) ⁵	1,981.9	2,980.5

The average cost for each EAC member country was as follows:

Item	Kenya	Tanzania	Uganda	Rwanda	Burundi
Average direct transport cost Per trip (USD)	1,282	3,375	2,243	4,383	2,391

⁴In order of frequency of use

⁵Excludes illicit costs

Freight Transport GHG Emissions Assessment

The assessment of the greenhouse gas (GHG) emissions resulting from road freight activities in the five selected countries has been carried out as the calculation of CO₂ emissions generated by truck movements along the main national corridors identified in the truck traffic census. The level of these emissions depends on a series of factors such as the number of vehicles circulating on a given route, the type of vehicles used, their average fuel consumption, as well as the average distance travelled on a daily basis. The assessment makes efficient use of the two datasets available: The truck traffic census, which captured the average daily truck traffic along national roads, irrespectively of their initial origin or end destination; and the survey data collected from truck drivers, which enables the refinement of some of the assumptions used for the CO₂ calculation. Several corrections were added by the team, to double-check some of the assumptions used in the methodology described in Section 3.3. Our assessment indicates the following annual CO₂ emissions caused by truck traffic in the five selected countries (in million tonnes per annum), based on the data available:

Annual CO ₂ emissions from truck traffic on main corridors, in million tonnes per annum					
Regional	Burundi	Kenya	Rwanda	Tanzania	Uganda
14.56	0.01	6.94	0.74	5.47	1.40

Conclusion

TMEA can consider this first RAATTE study to have largely met its objectives. Though, not without problems, the study successfully captured volume, movement, commodity, and cost data, to an extent never previously accomplished by TMEA. The data are largely consistent with expectations, usable, and useful. The data collected should help support the preparation of a regional trade observatory and also improve TMEA's capacity to forecast changes in prices and trade volumes to support its overall mission. And to that end, the study has largely met its goals.

Overall, the study identified the key trade routes being used for freight movements in East Africa, established that Rwanda has largely shifted to use of the Central Corridor for imports, and catalogued a variety of costs that are not well-studied in East Africa. The study also resulted in an emissions inventory for the region which can be built on and used to identify intervention opportunities in the future.

Other key observations arising from the study include:

1. The methodologies established under the RAATTE study did successfully collect most of the hoped-for data and could be repeated for future data collection exercises.
2. A full 25% of truck traffic is using the Mombasa-Kampala corridor and terminating in Nairobi (5.9%) or Kampala (19.1%).
3. Despite the concentration of traffic on the Mombasa-Kampala route, the majority of destinations use the Central Corridor. This includes Kigali which has largely shifted to using the Central Corridor over the past decade. It also includes Burundi which does receive goods via the Northern Corridor, but mostly those originating in Kampala.

4. Trade cost data collected includes comprehensive direct transport cost estimates by operators. These show that other than fuel tankers, container trucks were the most expensive to operate. However, they are also the most efficient by shipment tonnage, in terms of fuel consumption and emissions.
5. Reporting of illicit costs varied substantially across countries surveyed, ranging from just over USD 7 in Kenya up to USD 500 for trips to Rwanda using the Northern Corridor. The study team views these results with some scepticism and suggest these are best used as a baseline for future benchmarking.
6. Costs to trade varied substantially across the two corridors, with the average trip on the Central Corridor costing USD 4,883 while the average trip on the Northern Corridor cost 3,065, a 37% difference, accounted for, in part by the lower average distances travelled. However, the per km cost on the Central Corridor tended to be lower for trips to Bujumbura and Kigali resulting in a near balance of total cost across the two options.

While TMEA directed the study team to exclude focus group-based assessment of trade barriers from the full study, some data were collected via the OD Survey. These suggest that road condition improvements and resolution of delaying police checks and other policing issues are the most pressing trade barriers according to operators and may therefore be considered for future assessment of potential i

¹Central Corridor

²Central Corridor

