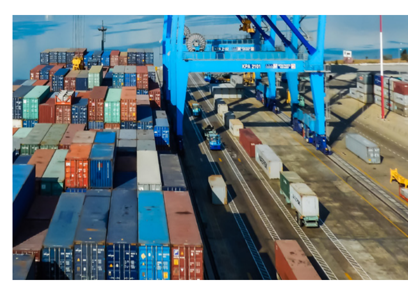
East Africa Freight Transport:
Enhancing Regional Connectivity



Case-Specific Policy Analysis

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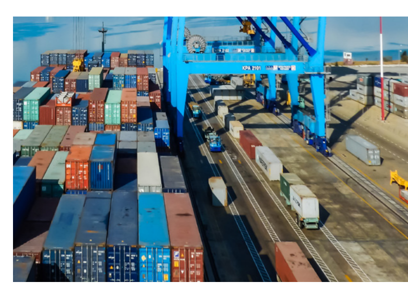

Case-Specific Policy Analysis

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Executive summary

Main findings

The East African countries covered in this study[1] are rich in natural resources, reflected in their major traded commodities: critical minerals, precious metals, and agricultural products. The region's population and economies are fast-growing. However, its dependence on the export of primary commodities makes it vulnerable to fluctuating prices, impacting its ability to invest in the infrastructure necessary for long-term economic growth.

Regional authorities understand these challenges and have identified actions to grow local production and to support value addition and reduce dependency on primary commodity exports. They have also established a regional institutional framework to support policy harmonisation for trade and undertake ambitious infrastructure investment plans. These efforts have the potential to reduce the region's high trade costs and improve access to markets. However, various factors create challenges for the movement of goods. These include infrastructure gaps, uneven levels of development in the region, and institutional barriers to harmonising policies for trade facilitation.

Road transport is the dominant mode for goods movement. This position is expected to be maintained up to 2050, despite trade in the region being dominated by weight-constrained commodities, which are well suited to lower-emission modes like rail and inland waterways. Due to gaps in infrastructure, the region relies on just a handful of corridors for freight transport, which reduces the network's resilience. This is a risk for the region, which is prone to disruptions from climate and geopolitical tensions.

Trade in the region is estimated to triple in weight and value by 2050. The growth in freight activity to accommodate this growth will require significant investment. In particular, addressing regional bottlenecks for the movement of goods and challenges relating to sustainability and resilience will require new infrastructure and better trade facilitation.

The region's corridors will continue to play a significant role in goods movement. However, improving connectivity and access for local networks can better distribute freight activity and advance access to markets for small-scale traders, fostering inclusive growth. Investment at key bottleneck locations, such as border crossings and ports, is also necessary to reduce further congestion on the main regional corridors.

Higher ambition for connectivity creates an opportunity to shift much of the region's exports to rail by 2050. In the "high ambition for connectivity" scenario, implementing the planned rail expansions in the region shifts approximately 15% of freight transport activity from road to rail. Rail is particularly suitable for moving bulk commodities over long distances. For the shift from road to rail to materialise, authorities will need to focus on improving intermodal connectivity and addressing last-mile issues.

Meeting current and future freight transport needs, improving connectivity, and maintaining reliability and cost-effectiveness will require more ambitious policy measures, and a stronger focus on addressing the sustainability and resilience of the freight transport system.

[1] Burundi, Democratic Republic of the Congo (DRC), Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania (Tanzania).

Top recommendations

Combine transport infrastructure investments with trade facilitation measures

Although the region's authorities have committed to improving freight transport in the region through ambitious infrastructure investments, these can be costly and protracted. As trade volumes increase, complementary trade facilitation measures should be targeted towards bottleneck locations – those likely to face more constraints with growing trade volumes, such as ports and border crossings. This approach can complement regional priorities and investments in infrastructure. As the region moves towards greater trade liberalisation, combining hard infrastructure investments and soft measures (such as addressing issues related to implementing trade facilitation) will ensure freight efficiency is maintained even as trade volumes grow.

Boost resilience by balancing corridor infrastructure investments with local community development

Regional infrastructure focuses on increasing the speed and capacity of freight movement, often at the cost of local accessibility, except at end-point cities. The gap in quality for secondary roads in the transport network increases costs and can prevent participation in trade, worsening inequality for local producers. Balancing regional investment with local access to regional networks avoids bypassing communities that could otherwise benefit from potential improvements in connectivity. Additionally, improving access in communities along regional corridors can improve economic inclusion and alleviate development disparities, while providing alternative options to the regional corridors in the event of disruptions.

Take a regional approach to addressing challenges in data and information sharing

Freight delays are worsened by limited data sharing along major corridors and inconsistent application of regional regulations. Despite the existing regional institutional framework to support trade policy harmonisation, various factors create challenges for regional policies. These include overlapping mandates and institutions, and diverse stages of development across countries. To address these challenges, regional institutions should prioritise sharing data and information through existing channels and better integrate digital systems to ensure interoperability with the systems that already operate successfully.

Bundle smaller interventions along regional corridors to mobilise funding

Interventions do not necessarily have to focus on major infrastructure investments that are complex and happen on long timescales. Implementing safety and efficiency measures like signalling systems and rehabilitation measures can improve connectivity by reducing the frequency of disruptions and, as a result, also reducing travel time. While major infrastructure projects are planned in the region, smaller interventions that have a significant impact on freight operations often lack attention from funders. Bundling projects across the region that feature similar scopes and which can share resources, can help to make such projects bankable, standardise project delivery, and decrease the time taken to deliver them. This approach can also help to address some of the challenges for mobilising funding.

Reduce freight emissions through regional technical co-operation

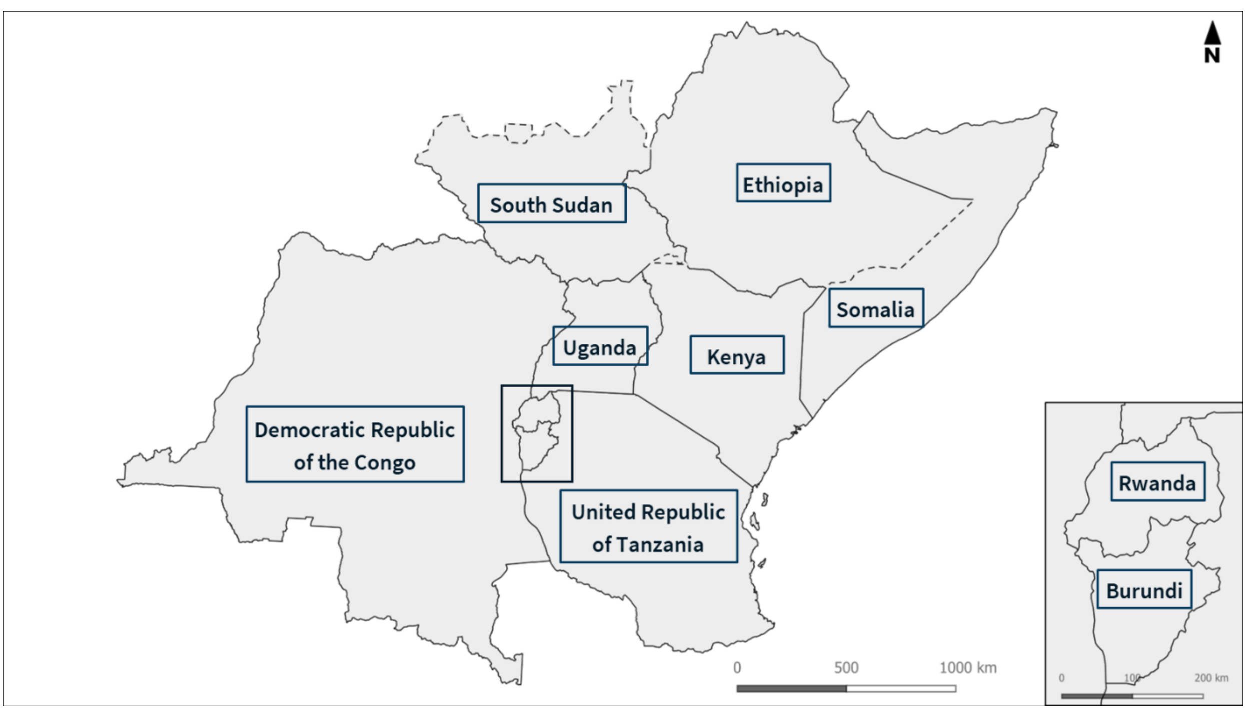
Achieving freight emissions reduction will require a significant shift from road transport to rail in the East African region. Challenges such as infrastructure availability, modal integration, and operating practices may constitute a barrier to achieving this modal shift. However, countries in the region share common priorities for sustainability, creating an opportunity to deepen regional collaboration by sharing experiences, information, and best practices. They also share common challenges – like dependence on road transport, infrastructure gaps, and informal cross-border trade. Some countries in the region have successfully implemented policies that can be applied to other countries. A regional approach, in collaboration with corridor management authorities, cooperatives, and traders' associations, can be used to scale up successful measures and provide technical assistance that is relevant to the context.

East Africa regional overview

East Africa has been experiencing faster economic growth than the other subregions of the African continent over the past five years (Economic Commission for Africa, 2025). Similar to the rest of sub-Saharan Africa, a significant proportion of the region's population is under the age of 30, which has implications for demand for infrastructure, goods, and services. The region's demographics, particularly its age structure (and its potential "demographic dividend"), present an opportunity for further economic growth, if supported by appropriate policies and investment in education, infrastructure and industrialisation (Herrera Dappe, Lebrand and Stokenberga, 2024).

This study's geographic scope (see Figure 1) focuses on nine East African countries: Burundi, Democratic Republic of the Congo (DRC), Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania (Tanzania). All countries included in the scope are partner states of the East African Community (EAC), with the exception of Ethiopia. The study region is home to a population of over 420 million people, diverse in cultures and rich in resources.

Figure 1. Geographic scope of the study



Africa is increasingly urbanising, and East Africa specifically will increase its share of population in urban areas from 44% in 2020 to 57% in 2050 (OECD et al., 2025). This growth is expected to have impacts on consumption and economic growth, and, as a result, on freight transport in the study region, which is currently largely reliant on imports from other world regions. DRC, Somalia, Tanzania, and Uganda are among the top ten countries on the continent with the fastest urban population growth, while Ethiopia deviates from this trend with its projected level of urbanisation in 2050 remaining below 40% (OECD et al., 2025). Coastal urban areas will continue to grow in some countries (e.g. Kenya), however, of Africa's projected urban population growth, 80% of it is on the interior of the continent, which will require better freight transport connectivity (OECD et al., 2025). This trend of growth in the interior is not just due to the high number of landlocked countries on the continent, it is also evident in coastal countries like Somalia, which is actually expected to reduce the share of its urban population living on the coast (OECD et al., 2025).

Although East Africa has enjoyed strong economic growth, individual countries in the study scope have varying development trajectories, institutional capacities, and living standards. Ethiopia, Kenya, Rwanda, and Tanzania have led growth in the study region, driven by agricultural production, industry expansion, and services, especially as international tourism rebounded following the disruption of Covid-19 (East African Community, 2024; Economic Commission for Africa, 2025). Less demand for primary commodities, mainly the extractive industries, slowed growth in DRC and South Sudan, while lower agricultural production rates impacted growth in Uganda and Burundi (EAC, 2024a). With strong regional institutions focused on reducing trade barriers, in combination with increasing investment in value-added sectors, the region has significant potential for greater connectivity and integration to support more inclusive economic growth.

There has been steady investment in infrastructure to meet the needs of the expected population growth on the continent, however, there remains a gap of over USD 40 billion between investment in transport infrastructure and projected needs (GI Hub, 2017). The African Union's Project for Infrastructure Development for Africa (PIDA) identifies 26 priority projects for transport across the continent to start closing this gap. In East Africa, these include major port, rail and road investments (African Union, 2020). Many of these projects are underway or planned and are expected to have a significant impact on integration, connectivity and trade in the region.

This report aims to evaluate how large-scale transport infrastructure programmes and ambitious policies can impact freight transport connectivity in East Africa and support regional development priorities. Box 1 provides a summary of the study structure, drawing on the ITF Framework for assessing regional freight connectivity.

Box 1. Study structure

This report combines qualitative and quantitative analysis with extensive stakeholder consultation. A literature review was conducted to understand the regional economic trends, trade flows, and major cost drivers for transport in the region. This was supplemented with feedback from regional stakeholders, who provided a clearer understanding of the regional context, infrastructure priorities and gaps, and the relevant existing policy initiatives.

The findings from the regional overview and stakeholder interviews inform the scenario analysis and transport modelling. This study examines two policy scenarios to forecast freight performance in East Africa. The **business as usual (BAU) scenario** maintains the current infrastructure plans and policy commitments, including projects and their associated timelines, reflecting the current ambition of decision-makers without assuming future policy shifts. The **higher ambition for connectivity (HA-C) scenario** assumes increased ambition to support the movement of goods in the region, including greater investments in transport infrastructure, and accelerated timelines on projects that better facilitate trade.

Qualitative analyses of initiatives related to sustainability and resilience in the region were also conducted, complemented with interviews with different stakeholders working in the region.

The remainder of this section is an overview of the study region's policy landscape and institutional environment. These relate to the region's freight movement, trade patterns, transport infrastructure and priorities and finally, transport cost drivers. This overview contextualises the understanding of how freight connectivity in the region may be affected by hard measures such as infrastructure investment, as well as soft policy measures, such as trade facilitation measures. It also provides the basis for scenario-setting for the quantitative analysis.

Freight transport policy and regulatory environment in East Africa

The interaction between regulatory environments and a country's factor endowments influences trade patterns. In general, the institutional environment influences trade costs and can support value addition. It is therefore important to understand the policy and regulatory environment governing goods movement for the study countries to identify relevant measures for improving freight connectivity. This sub-section focuses primarily on the relevant regional entities and trade agreements for the study region to better understand how trade is facilitated across borders.

Regional economic communities (RECs) are the critical bodies establishing the groundwork for regional (and eventually continental) co-operation and integration. The African Union recognises eight RECs; however, a country can have membership in multiple RECs. In the study region, there are four RECs with overlapping memberships (see Table 1). In this context, RECs are a valuable institution for improving regional integration and increasing intra-regional trade. The East African Community's (EACs) intra-regional trade (as a share of its total trade volumes) was slightly higher than Mercado Común del Sur (MERCOSUR) in 2023, and the South African Development Community's (SADCs) intra-regional trade was on par with the Association of Southeast Asian Nations (ASEAN) (Economic Commission for Africa, 2025).

Table 1. Regional economic communities memberships for the East Africa study countries

Regional economic community (REC)	Burundi	DRC	Ethiopia	Kenya	Rwanda	Somalia	South Sudan	Tanzania	Uganda
East African Community (EAC)	■	■		■	■	■	■	■	■
Common Market for Eastern and Southern Africa (COMESA)1	■	■	■	■	■	■			■
Intergovernmental Authority on Development (IGAD)2			■	■		■	■		■
South African Development Community (SADC)3		■						■	

Notes:
■ = Country holds membership with the regional economic community.
[1]COMESA also includes Djibouti, Comoros, Egypt, Eritrea, Eswatini, Libya, Madagascar, Malawi, Mauritius, Seychelles, Somalia, Sudan, Tunisia, Zambia and Zimbabwe.
[2]IGAD also includes Djibouti, Eritrea, South Sudan and Sudan.
[3]SADC also includes Angola, Botswana, Comoros, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Zambia and Zimbabwe.

The EAC is the most relevant REC for countries in the study region with respect to trade facilitation measures, because all but one of the study countries is a partner state. The EAC customs union and common market establish a common external tariff for the REC, as well as import tariff bands, and focus on reducing trade barriers within the REC. For Ethiopia, there are also some overlapping trade agreements with study countries that are members of COMESA. COMESA, IGAD, and SADC are also relevant for the study countries given their overlapping memberships. One key difference is that IGAD's focus is largely on security and resilience issues, and less on economic integration. COMESA and SADC are also focus on economic integration and are more similar to the EAC in this respect.

The 2004 EAC Customs Management Act (in force since 2005) aimed at trade liberalisation in the region, legislates the customs union among its partner states to promote regional production, industrial diversification, and economic development (EAC, 2024b). Initially, the EAC had three countries: Kenya, Uganda and Tanzania, and has since grown to eight member states, with Somalia being the most recent addition. The staggered involvement of partner states with the EAC means that the completion of its regional integration agenda remains varied between countries.

Despite the existing regional institutional framework to support policy harmonisation for trade, various factors challenge the implementation of regional policies in the study region. These include:

- issues of sovereignty, which limit the RECs legislative authority over their partner states
- membership in multiple RECs, which can create complexity in decision-making and increase the administrative burden for individual countries to ensure policy coherence
- the lack of compensation mechanisms for revenues lost in the integration process, which is particularly challenging for countries in earlier stages of development
- enforcement challenges, particularly when trade interests diverge among individual member countries, potentially undermining the effectiveness of existing agreements (Hersi, Alaslow and Omar, 2025; Mangeni and Atta-Mensah, 2022).

Beyond these challenges, infrastructure quality and investment, as well as access to markets will also play a role in the implementation of policies for trade facilitation, as is described in the "Regional transport infrastructure" section of the report.

Corridor management institutions in East Africa

The regional transport infrastructure network plays a significant role in integration and freight connectivity, because the cross-border movement of goods requires extensive co-operation between countries. In 1985, national authorities in the study region established a framework for facilitating regional co-operation for the movement of goods by all modes to address this challenge of facilitating transit freight. The first regional corridor established, the Northern Corridor, is overseen by the Northern Corridor Transit and Transport Coordination Authority (NCTTCA), a corridor management authority, and facilitates goods movement between the Port of Mombasa and its hinterlands. In 2006, a similar multilateral agency was established for connections between the Port of Dar es Salaam and its hinterlands, known as the Central Corridor, and overseen by the Central Corridor Transit Transport Facilitation Agency (CCTTFA).

The use of the corridors is overseen primarily by multilateral agreements between the member countries. This model for institutional co-ordination and governing transit freight has been successful in the study region. The corridor management institutions provide observatories for data collection and sharing (including real-time performance data), and platform for stakeholder engagement (including with the private sector). They are also a key partner in the delivery of cross-border infrastructure, and in addressing bottlenecks in the transport network. Similar approaches are being explored for the Djibouti-Ethiopia corridor. A development authority has also been established to plan, co-ordinate and manage the new Lamu Port South Sudan and Ethiopia Transport (LAPSSET) corridor (see Table 2).

Table 2. Main regional corridor management institutions and associated member countries

Regional corridor management institution	Burundi	DRC	Ethiopia	Kenya	Rwanda	Somalia	South Sudan	Tanzania	Uganda
Northern Corridor Transit and Transport Coordination Authority (NCTTCA)	■	■		■	■		■		■
Central Corridor Transit Transport Facilitation Agency (CCTTFA)1	■	■			■			■	■
Djibouti-Ethiopia Corridor Management Authority 2			■						
Lamu Port South Sudan and Ethiopia Transport (LAPSSET) Corridor Development Authority			■	■			■		

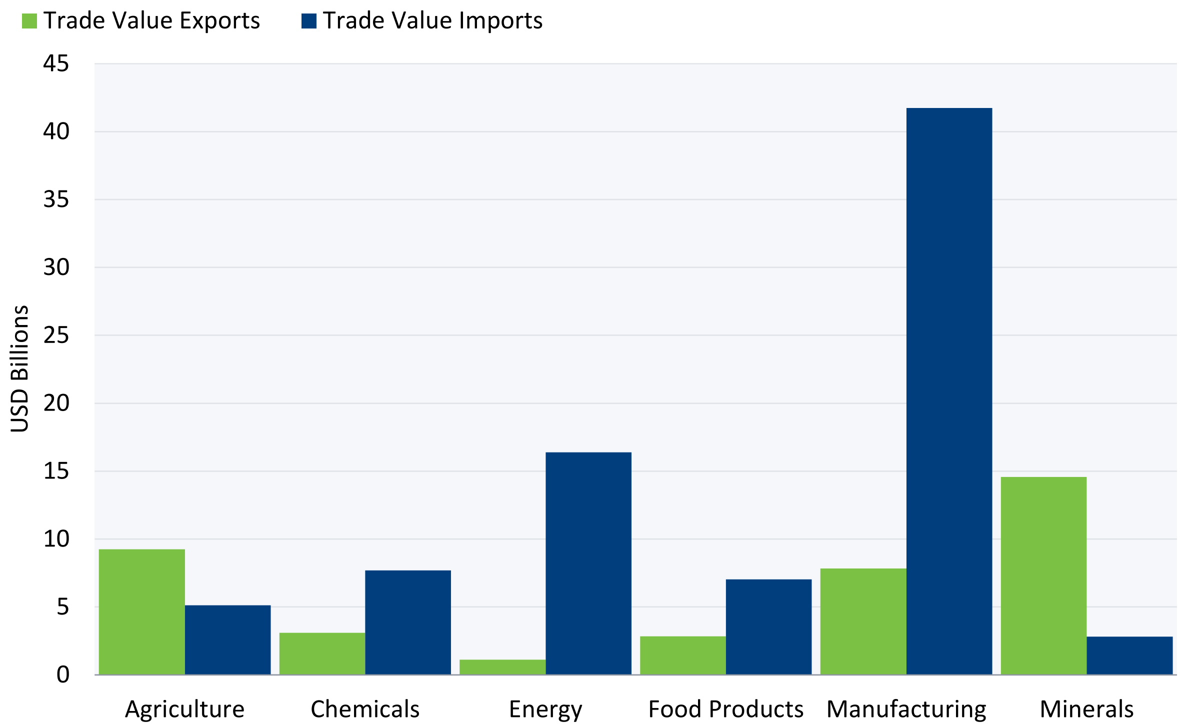
Notes:
■ = Country holds membership with the corridor management institution.
[1]Central Corridor also includes Malawi and Zambia as member countries.
[2]Djibouti-Ethiopia Corridor Management Authority is under development and will also include Djibouti in its scope (TradeMark Africa, 2025).

Trade overview affecting freight in East Africa

The study region's trade patterns can be mainly attributed to a combination of the countries' factor endowments and geographical factors (mainly the land and resource abundance). Countries in the study are characterised by an abundance of natural resources, which is reflected in their major traded commodities: critical minerals, precious metals, and agricultural products. In keeping with the decline in global trade in 2023 due to various geopolitical tensions, total trade value for the study countries grew more conservatively in 2023 compared to previous years (4% from 2022 to 2023 compared to 7% from 2021 to 2022) (Afreximbank, 2024).

The region's trade flows are dominated by the import of manufactured goods and energy products from key global partners, including the People's Republic of China, India, and the United Arab Emirates (United Nations Statistics Division, 2025). Exports from the region mainly include primary commodities: agricultural products, critical minerals, and non-ferrous metals – typically destined for the same key import partners (see Figure). Amongst the study countries, in 2022, Kenya and Tanzania had highest share of imports, followed closely by DRC and Ethiopia. This partly driven by their GDPs and populations, which are larger than the rest of the countries in the study region. DRC is the only country in the study region that is a net exporter of goods, mainly due to its critical mineral exports.

Figure 2. Total value of imports and exports by commodity in East Africa study region (2022)



Note: The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.

Source: United Nations Statistics Division (2025).

A major challenge associated with the dependence on the export of primary commodities is the vulnerability of prices to global events. Various overlapping crises in the past few years have illustrated the impacts of disruptions on commodity prices, and on global and local supply chains. Price fluctuations cause economic instability, worsen inequality and limit growth in the long term (UNCTAD, 2023; Wanzala and Obokoh, 2024). For transport systems, which enable trade, their interconnectedness with non-transport systems also makes them vulnerable to cascading effects of disruptions (ITF, 2024). When such disruptions happen, mobilising funding for the necessary investments in transport infrastructure for connectivity, sustainability and resilience becomes more challenging (UNCTAD, 2023).

Institutions in the study region recognise these challenges and have identified various actions to grow local production and support value addition, to reduce dependency on primary commodities. Increasing the value of exports for the region can be significant for its economic growth. Investment in industrial production, improving regional integration and implementing regulatory reforms will play a role in this process, which is necessary for inclusive economic development and will also alter the study countries' trade patterns.

The study region's energy imports and energy policies also play a significant role in shaping trade flows. Regional climate and geography present an opportunity to invest in clean energy sources, in particular renewable energy sources. To support the goals of industrialisation, the study region's energy capacity will need to ramp up significantly, and its reliability will need to improve. At present, major projects such as Ethiopia's Grand Ethiopian Renaissance Dam (GERD) are an opportunity to reduce the dependency on imported fuels (IEA, 2019). Similarly, the DRC has ambitious plans to develop hydropower capacity, and

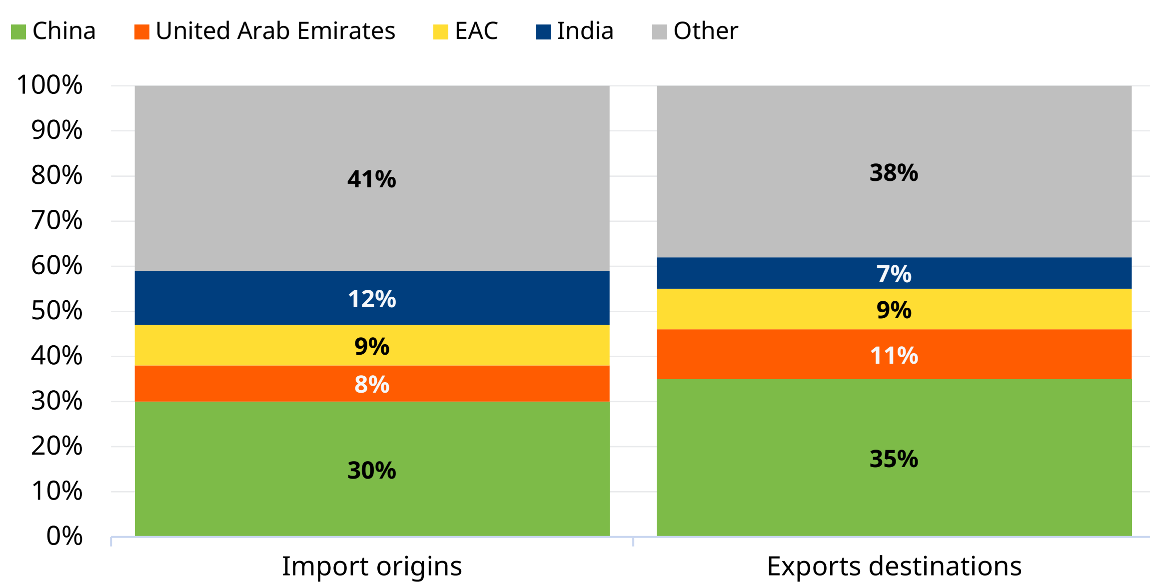
Kenya its own geothermal capacity (IEA, 2019). There is a significant opportunity to reduce reliance on imported energy in the study region, provided that stated policies for investment in electricity generation and transmission, and policies to transition to cleaner fleets are achieved (IEA, 2019).

Major trading partners for study region

The region's main trading partner is China, accounting for over 30% of total trade value, which is more than the next three trading partners combined (India, United Arab Emirates (UAE), and intra-regional trade) (see Figure). Geopolitical factors also impact trade flows; the study region has had a clear shift in major trading partners over the past decade.

Imports from China and India have grown steadily, while imports from the European Union and the United States have seemingly plateaued. Meanwhile, trade between the UAE and the EAC partner states has nearly doubled in the past five years, and trade is diversifying beyond energy products (East African Community, 2024). For example, the UAE is becoming a significant export destination for Rwanda and Burundi's agricultural exports, and for minerals from the whole study region. Trade with the gulf states is likely to continue growing with increasing bilateral trade agreements and driven by factors such as food security and the energy transition (Hodder, 2022).

Figure 3. Total merchandise trade value by trading partner of East Africa study region (2022)



Note: Figure highlights the top 4 trading partners, including the East Africa Community member states.
The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.

Source: United Nations Statistics Division (2025).

The increasing trade liberalisation and investment in infrastructure and industrial development happening on the African continent will further influence trading partners for the study region. However, a growing global preference towards bilateral trade agreements over multilateral trade agreements, due to increasing geopolitical uncertainty, might undermine some of the multilateral frameworks in place and further influence trade patterns (Dadush and Dominguez, 2023).

The share of the study region's exports destined to stay on the continent has been growing in the past decade, particularly non-extractive exports (Economic Commission for Africa, 2025). Trade on the continent between the COMESA and SADC RECs is most predominant for EAC partner states, and South Africa is a major trading partner for all the countries in the region. These flows illustrate the relevance of the Tripartite Free Trade Agreement (TFTA) discussed further in the next sub-section (Afreximbank, 2024). However, the high costs of transport within the study region and on the continent remain a barrier to trade between RECs and within the study region.

Intra-regional trade among the study countries accounts for approximately 18% of total trade, with Kenya and Uganda combined accounting for over half of this activity (East African Community, 2024; United Nations Statistics Division, 2025). Trade between EAC partner states is already liberalised (no tariffs on intra-regional trade); however as Ethiopia is not a member of the EAC, its inclusion in the REC could also increase this share. Beyond the official statistics, it is highly likely that intra-regional trade is significantly underestimated based on the levels of informal cross-border trade (see Box 2).

Box 2. Informal cross-border trade in the study region

Informal cross-border trade (ICBT) is prevalent in Africa in part due to the porosity of borders and thus likely to be significantly underestimated in trade statistics. Importantly, ICBT is not synonymous with trading illegal goods. Its characterisation as informal is mainly because it can pass through unofficial routes and is highly atomised: primarily made up of small quantities traded by many individual or unregistered traders (or micro and small enterprises) (UNCTAD, 2019). The traders are predominantly women and youth, who make up a significant share of the population not in formal employment, education or training.

Most ICBT consists of agricultural products and is dictated by proximity (i.e. markets and farms close to border communities). Estimates suggest that ICBT could account for as high as 7% to 16% of formal continental trade, and shares can be higher for smaller neighbouring landlocked countries (Economic Commission for Africa, 2025). In 2023 in Rwanda, for example, ICBT accounted for 11% of total trade with other countries included in the Northern Corridor. For Uganda, the share was approximately 17% (between January and September 2023). The share for DRC was even higher, albeit likely driven by various other factors, such as economic necessity, accounting for nearly 33% of total trade with other Northern Corridor member countries (NCTTCA, 2024a).

Structural challenges contribute to informality in trade, and can disproportionately impact individual trade, and micro and small enterprises. One significant challenge is costs, including: transport costs due to the availability and quality of infrastructure, costs to access information due to levels of digital penetration, and costs associated with complying with formal institutional frameworks and technical regulations (Mangeni F and Atta-Mensah J, 2022). Simplified trade regimes and the elimination of trade barriers on the continent are expected to ease some of these challenges for individuals and micro and small enterprises engaging in informal trade.

However, understanding the impact of trade facilitation measures on informal trade thus requires a better understanding of this trade activity. As a first step, the African Union Commission (AUC), working with United Nations Economic Commission for Africa (ECA) and the African Export Import Bank (Afreximbank) as well as various industry experts developed a methodology to standardise data collection for ICBT at the national level to inform decision-making and facilitate its integration into formal structures (Economic Commission for Africa, 2025). Including ICBT in formal structures can be beneficial for traders as it grants access to loans, tax relief, other social benefits, and potentially greater access to markets (Mangeni F and Atta-Mensah J, 2022).

Other actions to gradually integrate informal traders in formal structures include business training and professionalisation, and targeted training on trade policies through co-operatives and traders' associations. Investing in physical connectivity, hubs for agri-processing and packaging, storage facilities, and addressing issues related to extractive enforcement and harassment that can result in losses for traders and increases in overall transport costs will benefit ICBT (UNCTAD, 2019). Initiatives such as the Safe Trade Zone markets, for example, are designated facilities at border crossings to support small-scale cross-border traders who may not otherwise benefit from larger-scale regional investments in infrastructure (TradeMark Africa, 2022).

By nature, ICBT has potential positive impacts on economic inclusion for women and youth, the alleviation of poverty and the development of rural areas. With supportive policies, ICBT has the potential to increase incomes for traders and can be an opportunity to catalyse value chain creation in rural areas and border communities (UNCTAD, 2025b).

Regional trade agreements in East Africa

The global geopolitical trade climate is uncertain as trade policies are increasingly becoming entangled with concerns related to foreign policy (Dadush and Dominguez, 2023). In this context, preferential trade agreements and bilateral agreements between countries have been on the rise, with expediency due to uncertainty driving the shift to cement trade partnerships (Dadush and Dominguez, 2023). In Africa however, the trend is towards trade liberalisation and integration, with the understanding that as a bloc, the continent's economy, its young population, and its resource endowments present significant development opportunities.

Although historically most of Africa's trade has been destined for outside the continent, increasing recognition of the potential for intracontinental trade has driven re-examination of trade policies on the continent. This has culminated in the implementation of the African Continental Free Trade Agreement (AfCFTA), now signed by 53 and ratified by 48 of 54 African countries as of 2024 (Economic Commission for Africa, 2025). The negotiation of the AfCFTA relies on RECs, especially for less-resourced countries. AfCFTA encourages the maintenance of existing measures for trade liberalisation because its success is likely to follow increased trade both within and between RECs (Mangeni F and Atta-Mensah J, 2022).

In the East African study region, different policies and regulations, development trajectories, overlapping REC memberships, and diverging trade interests among individual member countries, are potentially undermining the effectiveness of existing agreements. Recognising the necessity for trade policy harmonisation, EAC, COMESA, and SADC have entered into a Tripartite Free Trade Area (TFTA) Agreement, eliminating most tariffs between partner states. Currently, 14 of the 29 countries covered by the agreement have ratified it, accounting for 75% of the area's GDP (SADC, 2024). Such agreements also function as building blocks towards the implementation of AfCFTA (See Table 3).

Table 3. Relevant trade agreements for East Africa study countries

Trade agreement	Burundi	DRC	Ethiopia	Kenya	Rwanda	Somalia	South Sudan	Tanzania	Uganda
Tripartite Free Trade Area Agreement (COMESA-EAC-SADC)	■	▒		■	■			▒	■
African Continental Free Trade Agreement (AfCFTA)	▒	■	■	■	■	▒	▒	■	■

Notes:
■ = Trade agreement is ratified
▒ = Trade agreement is signed
[1]Somalia has only ratified the AfCFTA domestically

The EAC has set the stage for trade liberalisation and market integration with the implementation of its single customs union and common market since its inception. In fact, among the continental RECs, EAC had the second highest intra-REC trade, second only to SADC (which is included in the Tripartite agreement) (Economic Commission for Africa, 2025). The EAC has also undertaken various actions to eliminate non-tariff barriers in the region and encourage regional integration. These supportive policies aimed at trade liberalisation both regionally and continentally present an opportunity for intra-regional trade, and new markets.

Regional transport infrastructure in East Africa

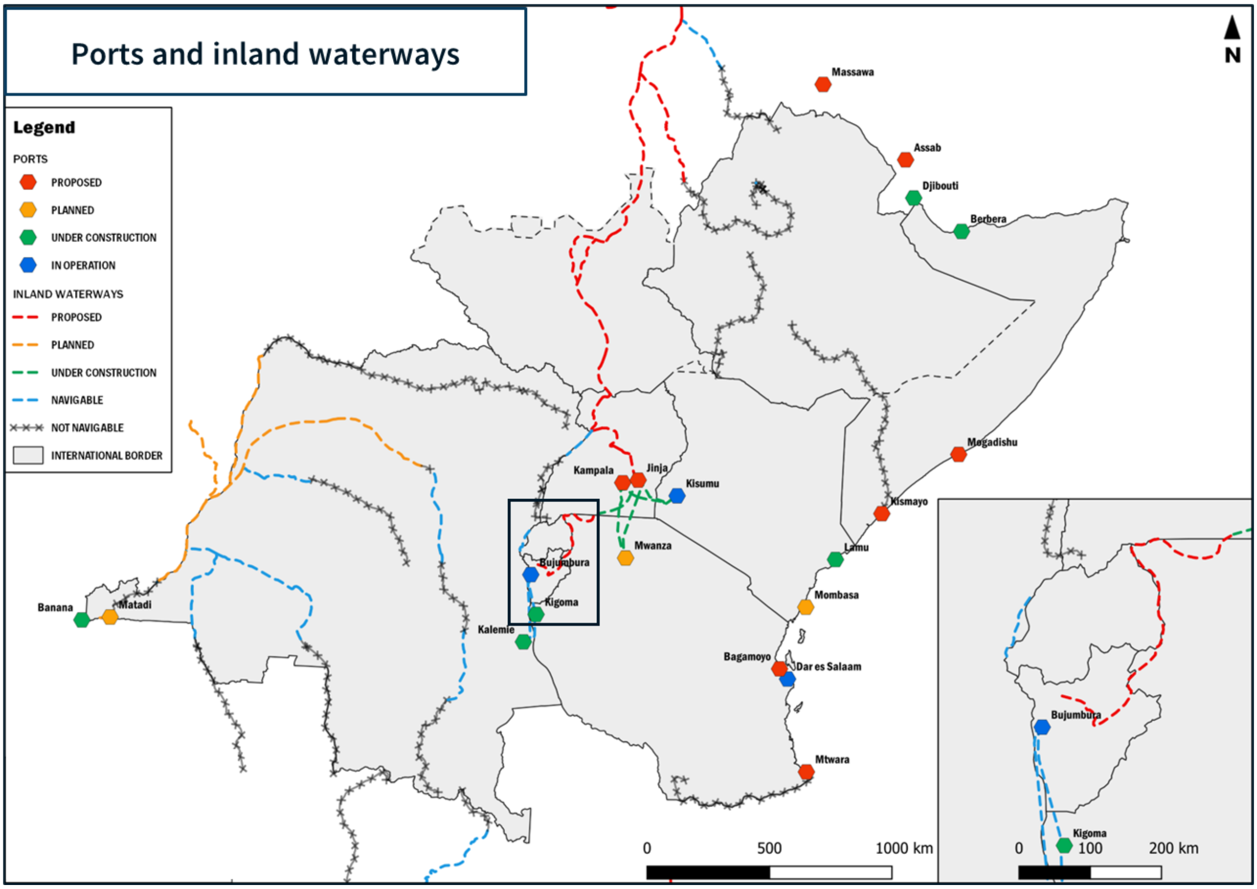
This sub-section provides an overview of the current and planned transport infrastructure for trade in the region. Given that trade in the study region is dominated by imports, maritime transport plays a major role in the movement of goods to East Africa. However, within the study region, road transport becomes the dominant mode for goods movement, responsible for 84% of total surface tonne-kilometres. The next highest mode share is rail, at nearly 13%. Air and inland waterways have a marginal share of total tonne-kilometres, but both modes are constrained by policies (competition regulations) in the case of air, and geography (seasonality and navigability) for inland waterways.

Maritime and inland waterway transport

Figure maps the study region's main seaports and inland waterways and ports. The main ports in the study region are on the east coast: Port of Mombasa, Port of Dar es Salaam and outside the geographic scope but relevant for the study, Port of Djibouti. Somalia has three main ports, with the ports of Mogadishu and Berbera handling most trade volumes. The DRC has three ports on its west coast, with the Matadi Port handling the highest volumes for the country's trade. The DRC also utilises neighbouring countries' ports on the west coast, specifically Pointe Noire and Port of Luanda.

The study region's waterborne freight transport network also includes inland waterways – primarily the lakes and navigable rivers. However, inland waterways are still significantly underutilised in part due to infrastructure condition and access issues. While some of the links are active, for example, those on Lake Victoria and on Lake Tanganyika, they played a more significant role historically.

Figure 4: Ports and inland waterways in East Africa study region



Notes: The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.
Maps based on information from AFDB, IGAD, AUDA-NEPAD, the World Bank, Central Corridor TTFA, Northern Corridor TTCA and national road agencies.
In operation: Ports opened during the last decade and without planned new upgrades (S4C).
Under construction: Ports with current construction works in progress (S4B), including existing ports with expansions underway.
Planned: Ports and inland waterways with feasibility study reports S4A, S3B, S3A, S2B), including existing ports with planned expansions.
Proposed: Ports and inland waterways without feasibility study and/or part of transport plans, including existing ports with proposed expansions.

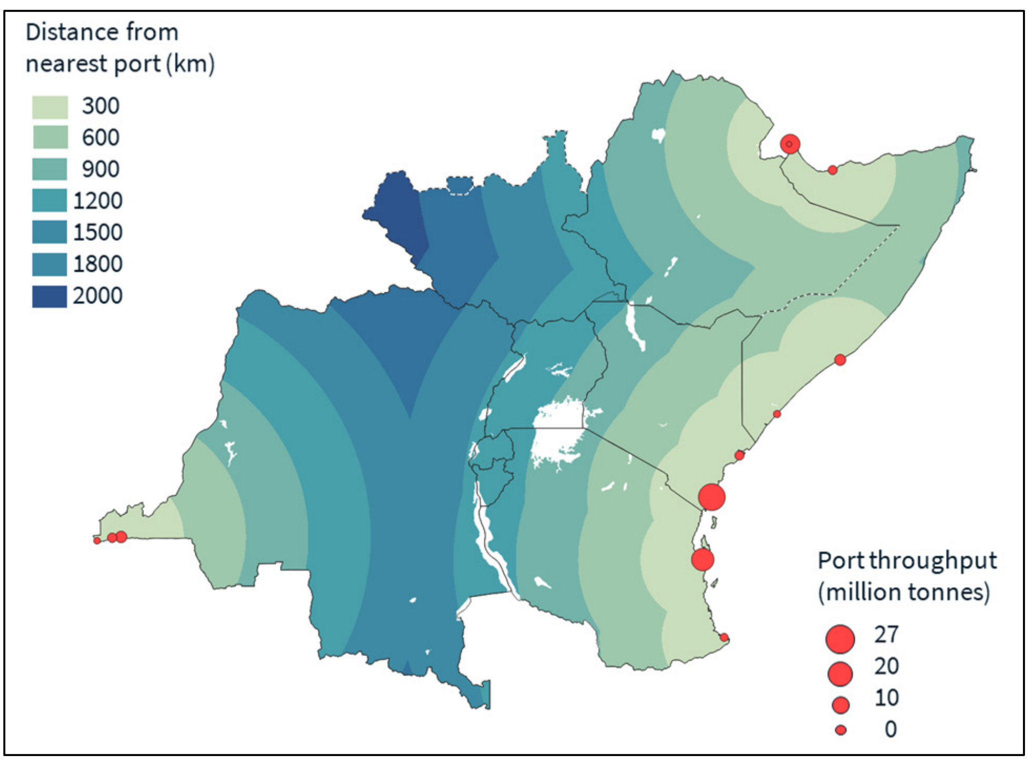
Most of the landlocked countries in the study region rely on one seaport and one major corridor due to a combination of distance and infrastructure availability, which has implications for resilience. In general, it makes it less likely for port hinterlands to select alternative routes, even in the event of significant delays or disruptions.

Ethiopia, for example, relies on the port of Djibouti for 95% of its cargo, with the remaining shares going through the ports of Sudan and Mombasa (Humphreys et al., 2019). As maritime trade connections develop to the ports of Berbera and Lamu, Ethiopia will have the opportunity to use these ports as well. Similarly, South Sudan primarily relies on the Port of Mombasa, although it is also expected to use the Lamu Port once the corridor projects are complete. Uganda relies largely on the Port of Mombasa, with a small share of its cargo also using the Port of Dar es Salaam and the Central Corridor. Rwanda mainly relies on the Port of Dar es Salaam, with about 88% of its cargo going through the Central Corridor. Burundi largely uses the Port of Dar es Salaam and the Central Corridor. (Northern and Central Corridors Transport Observatories, 2022).

The port of Mombasa has a large hinterland, including nearly all the study region's countries, and is also a feeder port connecting to Mogadishu and Dar es Salaam, and to transshipment hubs such as Djibouti and Durban (Humphreys et al., 2019). The port of Mombasa is Kenya's main port, handling a vast majority of its international trade, while Dar es Salaam is the equivalent for Tanzania, with smaller roles for the Tanga and Mtwara ports (Tanzania Ports Authority, 2022). The DRC also uses the ports of Dar es Salaam and Mombasa, relying on the port of Dar es Salaam about three times as much as the port of Mombasa. About 43% of the port traffic in Dar es Salaam is transit traffic, mainly to DRC, Rwanda and Zambia, and transit cargo volumes are growing (Tanzania Ports Authority, 2022). Transit volumes for the port of Mombasa are also growing, with Uganda, South Sudan and the DRC as the main destinations in terms of volume (NCTTCA, 2024a).

Travel times from the landlocked countries to the ports of Mombasa and Dar es Salaam along the Northern and Central corridors are within a four- to six-day range and Ethiopia's capital is approximately two days from the port of Djibouti (GI Hub, 2020; Northern and Central Corridors Transport Observatories, 2022). However, travel time from ports can vary significantly due to infrastructure quality, border clearance times and queues at key bottlenecks. For example, access to the port of Mombasa is often delayed by queues due to local road capacity issues, despite otherwise reasonable travel times along the corridor. These congestion issues extend inland from the port to the central business district and result in delays for freight movement and road safety issues and poor access for residents and businesses (TradeMark Africa, 2019). Figure shows the Euclidean distances from the study region's major ports to illustrate how far some of the hinterlands are to their main ports.

Figure 5. Major seaport distance to hinterlands and port throughput in East Africa study region (2022)



Notes: The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.
Source: Port throughput is based on ITF modelled estimates and information adapted from the World Bank, Central Corridor TTFA, Northern Corridor TTCA

There are significant ongoing investments in the study region's ports, the main one being the Port of Lamu in Kenya, which will increase port capacity for the region by 1.2 million TEU when complete (LCDA, 2025). This project is part of the LAPSSET corridor, and the port construction is accompanied by planned investments in roads, rail, and a pipeline to improve connectivity to inland countries (African Union, 2020). However, the expected trade volumes for the Lamu port have yet to materialise, and may be delayed until the connective infrastructure is complete. There are also planned expansions and efficiency improvements for other ports in the study region through private-public concession agreements, for example with DP World at Berbera and Banana ports. The agreement for Berbera port has resulted in an improvement in its cargo handling efficiency, and commitments to long-term investments in capacity (DP World, 2025).

Planned expansions at the ports of Mombasa and Dar es Salaam, combined with corridor investments increases their competitiveness and maintains their dominance for regional freight. The investments in corridor infrastructure focus on better connectivity including major rail projects and inland container depots to increase cargo capacity. In general, port performance in the region has been improving, with ship turnaround times decreasing, reductions in dwell time and better cargo handling efficiency (CCTTFA, 2023; NCTTCA, 2024a).

Increased automation for document processing has also reduced port-customs delays. This improvement has partly been driven by the Covid-19 pandemic, because of the requirement for non-intrusive measures for verification and cargo clearance processes. At the Nairobi Inland Container Depot, for example, dwell times have been reduced to an average of five days from seven days (FFEAFA and Shippers Council of Eastern Africa, 2021). However, data sharing amongst member countries of the EAC continues to be a barrier to the full implementation of the single customs territory, sometimes due to system issues.

Authorities have also consolidated efforts to harmonise port handling charges and increase transparency through publication of fees (CCTTFA, 2023; NCTTCA, 2024a). More efficiency improvements can be expected if port expansion investments continue as planned, along with measures to streamline and automate processes and reduce delays.

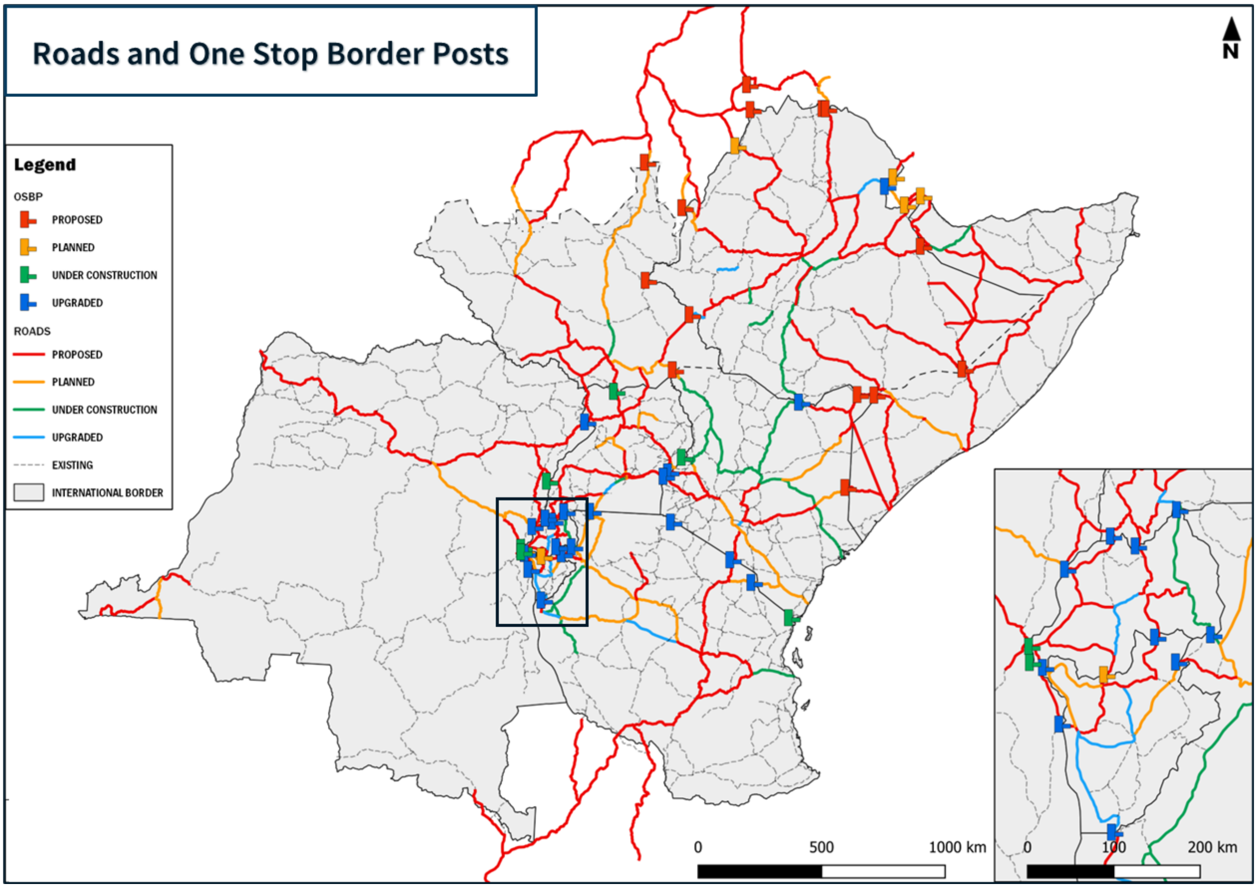
Investments are also underway to rehabilitate the infrastructure and improve the use of inland waterways. Intermodal connections between rail and inland waterways can more efficiently connect landlocked countries to seaports. However, various barriers persist for the adoption of the mode to move larger freight capacities – both in the region and globally (ITF, 2021b). In the region, beyond investing in improving infrastructure, and addressing navigability issues, building institutional capacity for the maritime sector has been a significant challenge. The Central Corridor, along with the Dar es Salaam Maritime Institute currently have a training programme to build capacity in the maritime sector (CCTTFA, 2023). Expanding such programmes across the region will be imperative for improving the use of inland waterways.

Road transport and border crossings

Road transport accounts for a vast majority of freight tonne-kilometres in the study region, being the only notable surface transport mode in some of its countries. The regional road network for freight includes established corridors (Northern and Central), as well as the Ethio-Djibouti corridor and the multimodal LAPSSET corridor, with connections to Ethiopia and South Sudan and is still under construction. The LAPSSET corridor is the most notable ongoing regional project, and it is part of the East-West Trans-African Beltway Corridor, making it a crucial link for the AfCFTA implementation (Infrastructure and Urban Development Department, 2023). A majority of the road projects associated with this project and under construction, with sections in Kenya mostly complete, and work ongoing on the remaining sections connecting to South Sudan and Ethiopia (Infrastructure and Urban Development Department, 2023).

There are also ongoing upgrade projects along the Northern and Central corridors, as well as proposed future connections throughout the region (see Figure).

Figure 6. Planned roads and one-stop border post projects in East Africa study region



Notes:
Upgraded: Roads and border posts opened during the last decade and without planned new upgrades (S4C)
Under construction: Roads and border posts with current construction works in progress (S4B)
Planned: Roads and border posts with at least: feasibility study reports, (S4A, S3B, S3A, S2C)
Proposed: Roads and border posts without a feasibility study and/or part of transport/economic corridors (S2A and S1)

Source: Adapted from AFDB, IGAD, AUDA-NEPAD, the World Bank, Central Corridor TTFA, Northern Corridor TTCA and national rail agencies.

In the study region, there have been over 4 500 km of road upgrades along the main corridors as part of the PIDA Priority Action Plan projects (Infrastructure and Urban Development Department, 2023). These projects aim to increase regional integration and facilitate trade and free movement as an opportunity to drive more inclusive growth. Road investments in the region have the potential to diversify trade routes and enhance economic growth, particularly for lower-income countries.

The main road network priorities for the established corridor management institutions are improvements to road conditions; upgrading unpaved roads and ongoing maintenance of designated routes. The road network density is sparse in some countries, and more limited still in terms of roads in good condition, which significantly impacts travel times and costs. A regional survey of traffic and trade trends found that poor road conditions were one of the most notable challenges for transporter operations (TradeMark Africa, 2020).

Maintaining and upgrading the region's extensive road network is costly; Ethiopia spent two-thirds of its budget for roads in the last 25 years on upgrade and maintenance activities (World Bank, 2023). In Somalia it is estimated that only 13% of the country's road network is paved, and most roads are in poor condition, resulting in slow overall operating speeds and high fuel costs (World Bank, 2021). Along the designated Northern corridor routes, the road conditions are largely considered to be in good or excellent condition, the main exceptions being rather large sections in the Eastern DRC and South Sudan, where a significant share of roads are unpaved (NCTTCA, 2024a). Only about a quarter of the DRC's national roads are paved (UNEP, 2024).

Most of the designated routes along the Central corridor connecting to the study region countries are also considered to be in good condition (CCTTFA, 2023). Beyond the designated regional corridor routes however, road conditions are largely poor, especially in rural areas, which contributes to high overall regional transport costs, discussed further in the "Transport cost drivers in the region" section.

The freight volumes along the major corridors are significant: the Northern corridor, one of the continent's busiest routes, moves up to 3 000 trucks a day; 35% of the cargo processed at Dar es Salaam port uses the Central corridor; and the roads of the Ethio-Djibouti corridor carry over 80% of the country's trade (CCTTFA, 2023; NCTTCA, 2024a; World Bank, 2021, 2023). The concentration of freight activity along major corridors means that a significant share of the study region's freight moves through certain key locations (e.g. the border crossings between Kenya and Uganda at Malaba – one of the busiest crossings on the continent) (African Union Development Agency - NEPAD and Japan International Cooperation Agency, 2024).

Border crossings thus play a significant role in facilitating regional integration. The trade imbalance in the region impacts the overall efficiency of border crossings. Import procedures tend to be more complex based on import regulations, whereas export procedures can be simpler, especially in the case of homogenous bulk commodities (African Union Development Agency - NEPAD and Japan International Cooperation Agency, 2024).

To address these challenges, there has been an ongoing regional effort to improve border crossings and to harmonise customs procedures, even as the region gradually moves towards fully implementing the single customs union. Delays at border crossings are the result of a combination of issues, from road infrastructure constraints (e.g. limited lane capacities) to traffic management issues and complex customs clearance procedures. While infrastructure improvements are still imperative, with five of the nine countries in the study region being landlocked, more efficient and integrated border management procedures can have a significant effect on travel times and costs of moving goods in the region. The main initiative to address this is the implementation of infrastructure and integrated border management projects, called One-Stop Border Posts (OSBPs) which are meant to simplify border clearance procedures (see Box 3). These are occurring across the continent.

Box 3. One-stop border Posts

One-stop borders posts (OSBPs) are a trade facilitation tool combining physical infrastructure with integrated border management procedures at the one location to manage both the entry and exit procedures for border crossings. The joint processing effectively reduces administrative duplication and processing times. OSBPs require a supportive legal framework for operation. In the East African Community (EAC), this is established through the OSBP Act (2016), and is connected to the single customs territory, which also reduces internal border controls within the customs union (Calabrese et al., 2023).

Beyond the legal framework, OSBPs require significant co-ordination across institutions, infrastructure development partners, and existing border operators. Early in the process, it is also necessary for authorities to identify how ownership and operational management will function across borders; a process which can be led by the EAC and its partners in the study region context. The study region currently has 18 active OSBPs, and about 40 more under consideration for upgrade. Along the Northern and Central corridors most of the crossings for designated routes are already OSBPs, as are some of the main crossings for the LAPSSET corridor.

A recent assessment of the performance of OSBPs on the continent led by the Japan International Cooperation Agency (JICA) found that their full implementation could result in significant reductions in total dwell times at borders (on average a 42% reduction for surveyed OSBPs). For the Central corridor, the average reduction for the five surveyed OSBPs was 68%. The implementation of OSBPs can also increase revenue collection. Uganda's Revenue Authority reported a 40% increase in revenue at its main border crossing with Rwanda – the Katuna/Gatuna OSBP (African Union Development Agency - NEPAD and Japan International Cooperation Agency, 2024).

Importantly, improvements in crossing times are not solely due to the introduction of infrastructure, but rather, the combination of hard and soft measures, and improved digitalisation measures. For example, at the Tunduma OSBP (the border of Tanzania and DRC), the clearance time reduced by 79% (from nearly six days in 2021 to 28 hours in 2022) following the introduction of x-ray cargo scanners in addition to infrastructure and integrated border management procedures (TradeMark Africa, 2023).

However, improvements in border crossing times can also result in rebound effects: reducing delays can attract more traffic. This has been the case at various OSBP locations, which have seen increased volumes. This emphasises the importance of data collection for performance monitoring to get the most out of investments. The EAC has a tool for the measurement of performance at OSBPs, which can be useful for identifying the impact of investments and promoting transparency around projects.

As the study region goes towards full trade liberalisation (through the EAC single customs territory, the TFTA, and the AfCFTA), there should also be consideration for the potential adaptiveness of the OSBP infrastructure for future uses. In this context, digitalisation measures will also play a greater role in trade facilitation. Cargo tracking systems, such as the Rail Freight Logistics Platform and Regional Electronic Cargo Tracking System, are already in place in the study region. They not only provide valuable data for operations management and understanding trade flows, but also have the potential to reduce cargo dwell times and border crossing times further, reducing trade costs as a result.

The study region's implementation of OSBPs is an example of how the combination of hard and soft measures can improve trade flows and have tangible impacts on transport costs and total travel times.

Rail transport

The role of the rail network in freight movement for the study region is growing, with the ongoing implementation of the East African Railway Master Plan. The master plan includes a combination of modernisation and expansion projects, from rehabilitating existing rail, to building new lines. The region's major corridors all include rail lines, with the Standard Gauge Rail (SGR) connecting Nairobi to Mombasa carrying the largest rail volumes in the region (approximately 6 million tonnes in 2023) (NCTTCA, 2024a). The Ethio-Djibouti corridor has also been increasing the freight volumes moved by rail, having just surpassed 2 million tonnes in 2023, which is still well below the designed capacity (Ministry of Transport and Logistics, 2024). The old metre gauge railway (MGR) network is also still very active in the region, as even the freight moving along the new SGR lines is transshipped onto the MGR in some areas.

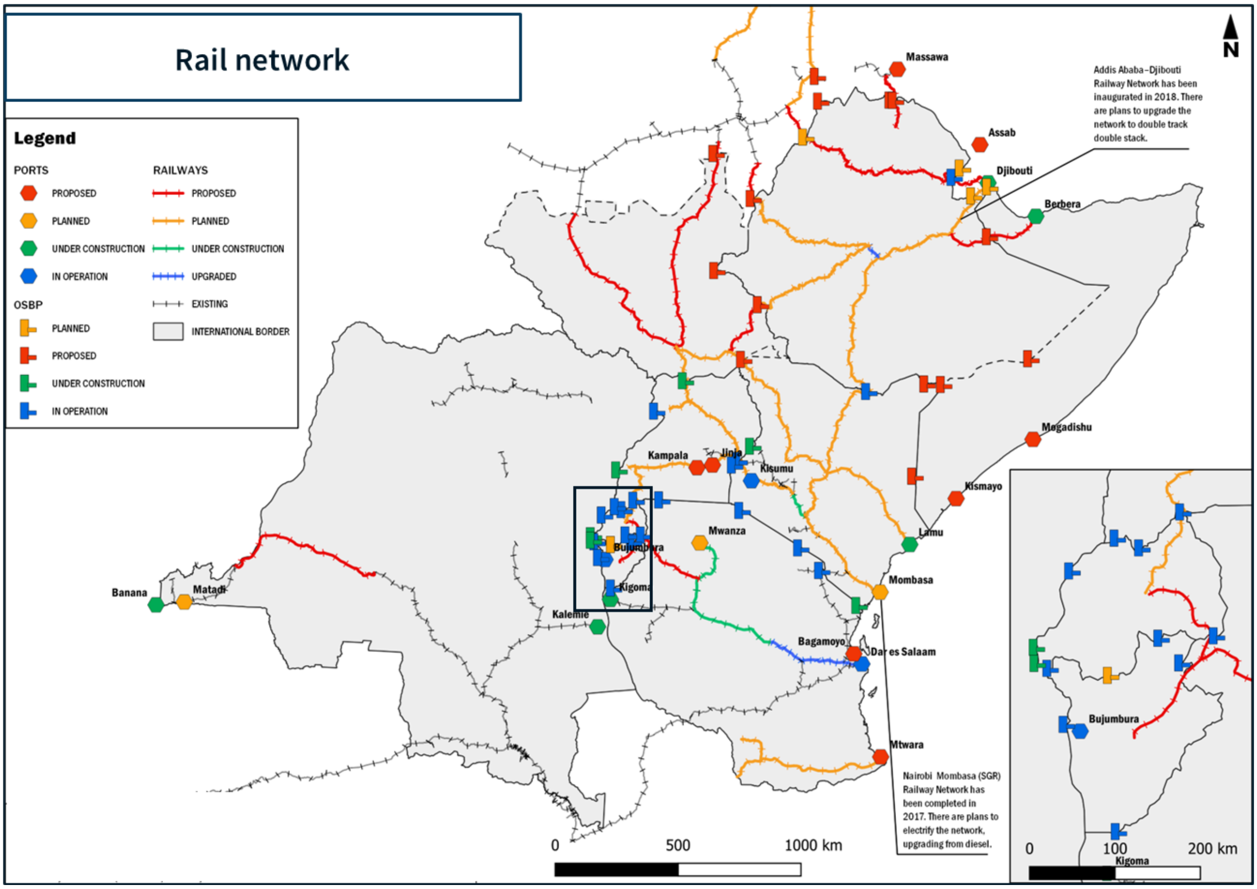
The newest rail project in the region is the recently inaugurated Tanzania SGR along the Central corridor, due to begin freight operations in 2025. The project is being developed in phases, with the section from Dar es Salaam to Dodoma, Tanzania's capital, currently operational. The SGR sections of the corridor in Tanzania are over 60% complete, and the plan is to continue the network to connect to Burundi, Rwanda, and the DRC. There are also ongoing projects within Ethiopia to link the regions, although regional conflicts have delayed some of the work (Ministry of Transport and Logistics, 2024). The planned expansions in the region also include extensions for the Northern corridor into Uganda, and the LAPSSET corridor rail projects connecting the Lamu port to Addis Ababa in Ethiopia and Juba in South Sudan. Many of the new lines are planned to be electric, and the Ethio-Djibouti SGR and new Tanzanian SGR are already electric, which will also mean fewer overall emissions from freight transport (see Figure).

Rail's mode share in the study region is still low, owing to gaps in the network and a large maintenance deficit for the MGR. In various sections, there are speed restrictions on the rail network due to infrastructure issues, creating reliability challenges (CCTTFA, 2023). Additionally, rail networks in the study region (and on the continent) have historically been developed to facilitate mineral extraction, meaning that the legacy networks lack intra-regional connectivity, leaving various gaps in coverage (Oliete Josa and Magrinyà, 2018).

As road transport became more cost-competitive, due partly to its flexibility, maintenance of the rail networks in the region degraded further, cementing the dominance of road transport. Additionally, the variation in railway gauges in the existing network requires transfers and increases travel times and costs, making the mode less competitive. For example, Tanzania currently has three different rail gauge standards (SGR, MGR, and the Cape Gauge). It is also worth noting that despite significant ambition and progress for rail in the region, there remain challenges for the completion of the projects due to their scale and complexity, and for mobilising funding.

Nonetheless, decision-makers in the study region recognise the benefits of increasing rail mode share for freight movement, and the necessity for better integrating the mode. For example, Ethiopia is working towards increasing the capacity of rail freight and estimates that rail will have a 15% share of total freight activity by 2028 (Ministry of Transport and Logistics, 2024). In Kenya, Vision 2030 specifies actions to increase rail capacity to facilitate mode shift from road to rail. The results so far have seen some increase in rail use for long-distance bulk cargo transport. Similarly, Rwanda's Transport Sector's Strategic Plan focuses on developing rail in the country, along the main regional corridors, and on improving inter-modal transfers and rail-to-road freight terminals. Uganda plans in its Nationally Determined Contributions (NDCs) to implement over 1 400 km of fully electrified SGR by 2050 and to rehabilitate its MGR (NCTTCA, 2024b).

Figure 7. Planned rail projects in East Africa study region



Notes:
Upgraded: Rail opened during the last decade and without planned new upgrades (S4C)
Under construction: Rail with current construction works in progress (S4B)
Planned: Rail with at least: feasibility study reports, (S4A, S3B, S3A, S2C), including existing and operational rail with planned upgrades
Proposed: Rail without feasibility study and/or part of transport/economic corridors (S2A and S1), including existing and operational rail with proposed upgrades

Source: Adapted from AFDB, IGAD, AUDA-NEPAD, the World Bank, Central Corridor TTFA, Northern Corridor TTCA and national rail agencies.

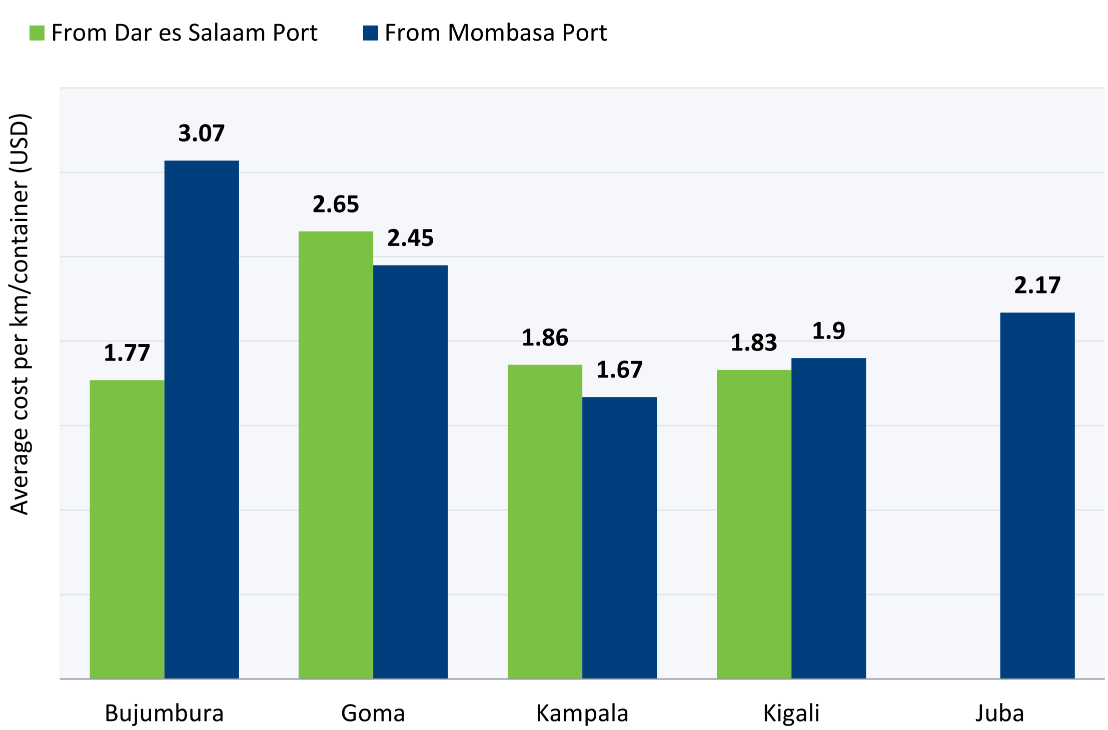
Importantly, rail plays a role in intermodal transport in the region, as some freight, albeit a small share, currently moves from rail to inland waterways (e.g. at Kisumu port on Lake Victoria). Achieving greater multimodality for freight movement in the region can have an impact on emissions but will require better intermodal co-ordination and implies a larger role for the study regions inland container depots (NCTTCA, 2024b). Rail is also well suited to the study region's main export commodities, given that it is well suited to carry bulk goods over long distances. However, the study region's trade imbalance already means that there is a high rate of empty returns, which contributes to high costs. Additionally, the volume of micro and small enterprises in the logistics sector would make consolidation challenging and may incur additional costs for last-mile deliveries.

Transport cost drivers in the East Africa region

Goods movement in the study region is influenced by high trade and transport costs. These costs impact trade volumes and limit the effectiveness of trade facilitation measures. One of the main objectives of enhancing freight connectivity is to reduce freight transport costs, giving producers more market access, which can influence economic development. In the study region, various factors influence trade and transport costs, and these factors differ nationally. These factors include geography, infrastructure availability and condition, geopolitical tensions, and the structure of the logistics industry. Understanding the main drivers of transport and trade costs can help to better inform policy interventions to improve connectivity.

Figure below from the joint report by the Northern and Central corridors shows average transport costs per kilometre along the major corridors in the study region to some of the cities in the study region. For Somalia, the World Bank estimates that the costs for long-distance transport by corridor can range from USD 4 to USD 15 per kilometre, depending on the corridor, with checkpoints and roadblocks contributing to as much as 60% of costs in the most expensive corridors (World Bank, 2021). These are among the highest costs on the continent. In Ethiopia, the costs per container are approximately USD 2 per kilometre along the Ethio-Djibouti corridor, in part influenced by the market structure of the logistics industry (UNCTAD, 2021). However, the increasing competitiveness of rail along that corridor is likely to reduce costs.

Figure 8. Road transport rates from the ports of Dar es Salaam and Mombasa to various locations in East Africa study region (2021)



Source: Adapted from Northern and Central Corridors Transport Observatories (2022).

Geography, infrastructure and security

The main geographic factors influencing costs are travel distances and geographic barriers to infrastructure expansion and maintenance. One study found that prices increase by approximately 3% for every 10% increase in distance, controlling for volume and location-specific characteristics (Herrera Dappe, Lebrand and Stokenberga, 2024). However, there is a limit to cost savings through distance reductions, and there are also practical constraints to reducing travel distance. In the study region, there are opportunities to explore infrastructure improvements to reduce travel time, such as improving road quality and capacity (Herrera Dappe, Lebrand and Stokenberga, 2024).

There are also opportunities to expand low-cost freight infrastructure, but these also face practical challenges. For example, while inland waterways have significant potential for long-distance bulk movement of goods, in the study region, their seasonality and navigability vary, making many of them a less viable option. Similarly, flood risks in the region increase the costs of maintenance for infrastructure and can also impact routing choices, which is also a challenge for transport system resilience.

The study region's dependence on primary commodities makes it vulnerable to price shocks and influences long-term investment in infrastructure maintenance and expansion. This infrastructure gap contributes to the costs of transport within the study countries. Additionally, it reduces domestic trade potential and productivity. Commodity dependence in the study region is partly the result of colonial legacies of extraction, which shaped the transport network and spatial organisation of the region (Oliete Josa and Magrinyà, 2018). This is further reinforced through the subsequent organisation of economic activity to leverage established productive clusters, in part because the costs related to relocation may outweigh potential benefits (Herrera Dappe, Lebrand and Stokenberga, 2024).

The result is that the flow of goods continues to be oriented outwards (or towards ports) because costs tend to be lower, and the types of commodities being transported increase the instances of vehicles running with low payloads or empty trips, known as empty returns, This largely benefits production centres with higher quality road or rail access to ports. However, if transport costs are high within the country – from agricultural production centres to population centres for example – this ultimately also impacts costs for international trade. This highlights the need for balancing regional connectivity with local connectivity, considering the role of local connectivity in reducing overall transport costs, and importantly, reducing transport costs for locally produced goods (Herrera Dappe, Lebrand and Stokenberga, 2024). In the study region, this can be particularly beneficial for the landlocked countries which already face high transport costs, and for improving intra-regional trade.

Beyond the challenges of geography and legacy investments, other factors, such as geopolitical tensions and conflicts shape the movement of goods in the region. Instability and security issues hinder the movement of goods (with additional roadblocks and checkpoints), and protracted conflicts impact investment in infrastructure by raising safety and investment risks and influencing routing options. These issues impact the price per tonne-kilometre of moving goods, making them 3-7% higher in areas experiencing conflicts (Herrera Dappe, Lebrand and Stokenberga, 2024).

Services and system inefficiencies

The structure of logistics services also contributes to prices, with higher costs where there is limited competition. Vertical integration and increasing market concentration in container shipping has impacts on transport costs, particularly given the trade patterns of the study region (ITF, 2018). Lack of competition in logistics services within the countries influences not only the movement of goods but also constrains value chain addition and industrialisation. In Ethiopia, for example, lower labour costs in the textile industries are negated by high transport costs, which can impact where firms choose to locate themselves (World Bank, 2023). Similarly, along the Northern corridor, the rail connection between Mombasa and Nairobi creates necessary competition that lowers costs for that section, but trucking companies can be reluctant to shift to rail due to challenges transferring between modes, and a preference for maintaining their current operating practices.

Finally, inefficiencies in the transport system contribute to costs for operators. For example, while port performance may be improving at the Port of Mombasa, queues still form to access the port because of capacity constraints on the local road network. Lamu port has similar access-to-port challenges but also faces challenges with respect to storage and staff capacity. Similarly, while border crossing clearance times in the region have trended downwards, space constraints and infrastructure gaps still result in queues for truck operators. In the region, trucks are estimated to spend nearly one-third of their time on stops: waiting at borders, weighbridges, and roadblocks (Eberhard-Ruiz and Calabrese, 2018).

Limited data sharing along major corridors, and different levels of application for regional regulations between countries also contribute to delays. For example, while Kenya and Uganda have implemented vehicle weigh-in-motion systems to ease compliance with the EAC Vehicle Load Control Act, other EAC partner states are lagging, which means that delays are still possible at border crossings in compliant countries (NCTTCA, 2024a). All these factors related to the application of regulation and harmonisation of rules lead to delays and higher transport costs.

Addressing costs

Some of the factors that contribute to high trade and transport costs can be resolved with higher quality infrastructure. Regional road projects and border crossing investments financed by multilateral banks in the study countries have improved travel times and reliability, resulting in significant cost savings (Herrera Dappe, Lebrand and Stokenberga, 2024). Improving road conditions and investing in local connectivity and secondary networks have the potential to increase the value of agricultural land and to decrease transport costs and the prices of agricultural products (Herrera Dappe, Lebrand and Stokenberga, 2024; Kiprono and Matsumoto, 2018). The current regional focus on strategic improvements should be balanced with local connectivity (especially rural centres of production where small investments can have multiplier effects for economic inclusion), to ensure that transport cost issues are addressed at both levels.

Measures to improve connectivity will also require addressing the cost inefficiencies that contribute to transport costs. The harmonisation of policies and regulations across the region may play an equally significant role in addressing transport costs and delays at border crossings. Focusing on the implementation of regional regulations can also help to harmonise related administrative barriers at the national level. That is, regional policies can determine the baseline, allowing for individual countries to set higher ambitions – particularly those with limited institutional capacities.

Some countries in the study region have implemented electronic single windows (ESW) to varying degrees, however there are still instances of regulatory fragmentation even at the national level. Ethiopia, for example, connects 16 regulatory agencies on its platform to facilitate processing of all documentation and reduce duplication, while in Burundi, the application of ESW is moving at a more gradual pace, currently only applicable for pharmaceutical imports. A regional approach for supporting such reforms can help countries learn from the experience of their neighbours.

A regional focus also helps to limit discrepancies between national policies and multilateral frameworks, reducing instances of regulatory fragmentation at the national levels. The EAC Customs Management Act, for example, sets a common external tariff, and creates some transparency around customs fees and charges. However, without adequate consultation with stakeholders on changes to fees and charges, or standard and transparent reporting of fees between border agencies, it can lead to confusion for service providers (Shippers Council of Eastern Africa, 2021).

Improving freight transport connectivity in East Africa

Freight connectivity refers to the seamless, well-integrated and efficient movement of goods within and across borders. It encompasses three key elements:

- physical connectivity; the hard infrastructure of the transport network
- institutional connectivity; the harmonisation of regulations and trade policies to enable the movement of goods from their origins to their destinations
- market connectivity; the co-ordination between logistics service providers, businesses and producers, and government agencies (Banomyong, 2024).

Connectivity is associated with various measurable attributes, including the extent and density of the transport network, its capacity and structure, its conditions and its alignment (McKinnon, 2024a). Many of these attributes are related to the physical aspects of connectivity, however, addressing connectivity requires an understanding of how the physical interacts with the institutional and market connectivity to ease or impede the movement of goods.

Addressing connectivity can also have impacts on other priorities, namely sustainability and resilience. The relationships between connectivity, sustainability and resilience can be complex, and may require trade-offs, but they can also be mutually reinforcing, allowing for the selection of policy measures that can address all three priorities (McKinnon, 2024a). There are also interconnected opportunities and challenges related to the sustainability and resilience of the freight transport system in the study region, as discussed further in the following chapter.

This section provides an overview of the scenario analysis for the study of this report. It begins with a description of the two scenarios, followed by the regional freight flow forecasts. These identify opportunities to improve the East African study region's freight connectivity.

Freight modelling scenario descriptions

The first scenario, *Business as Usual (*BAU) includes the committed and ongoing policies and investments in infrastructure at the regional level. The main regional projects expected to be completed by 2050 are the LAPSSET corridor road projects, further implementation of One-stop border posts (OSBPs), port investments that are already underway (e.g. Berbera port, Dar es Salaam Maritime Gateway project), and completion of the Tanzania Standard gauge rail (SGR) project. For rail, the BAU scenario includes the active (and close-to-completion) rail projects, but takes into account various delays to the completion of projects due to ongoing conflicts in the region, and challenges with mobilising funding. Additionally, for many of the rail projects, completion dates are expected to be beyond the study horizon.

The BAU scenario also assumes improvements in overall travel times in the study region through the gradual improvement of roads, including both maintenance and upgrade activities. For OSBPs, it is expected that border clearance times will continue improving with further harmonisation of border crossing procedures, particularly between EAC member countries, and with the wider adoption of digital systems, such as the Regional Electronic Cargo Tracking Systems. Additionally, dwell times at intermodal terminals and at ports are expected to gradually improve, following the trends from recent years noted by the corridor management institutions (CCTTFA, 2023; NCTTCA, 2024a).

The second scenario, *Higher Ambition for Connectivity* (HA-C), includes all the policies of the BAU, but with a notable increase in ambition, in both the timeline and scale of implementation. Specifically, in addition to the planned projects, the HA-C scenario assumes operational improvements to rail to address reliability concerns and increase overall capacity. Rail improvements will create greater use of assets and allow a greater uptake of harmonisation measures to improve intermodal connectivity, improvements to address the variation in gauges in the region. As for new rail corridors, the HA-C primarily focuses on actively underway projects (e.g. projects in Tanzania) based on the same constraints in the BAU to keep the assumptions grounded in reality. It also assumes greater improvements in port capacity and handling efficiency compared to the BAU scenario. For additional ports, the HA-C assumes the second phase of the Lamu port will be operational, as well as the Banana port in DRC.

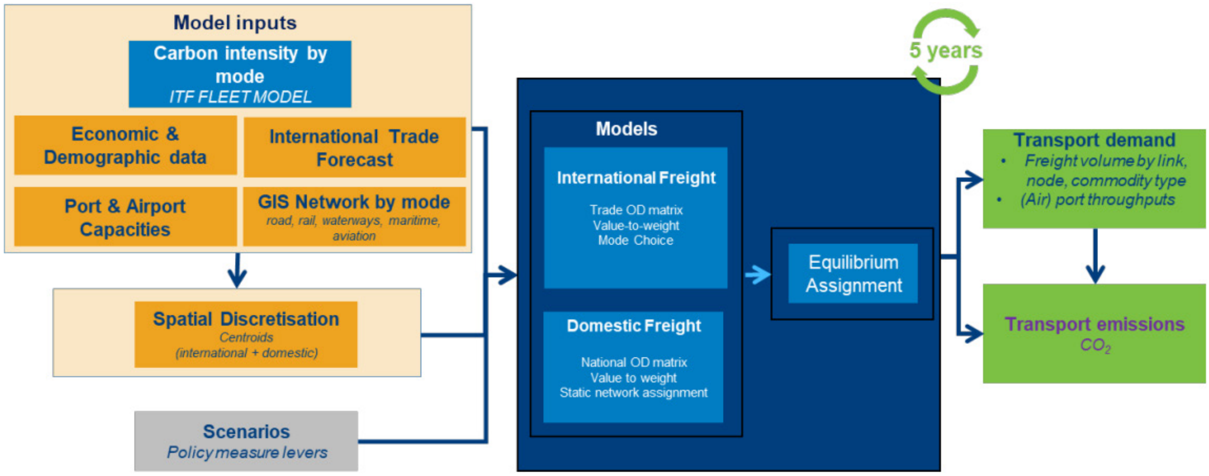
Travel time reductions in the HA-C are based on more extensive road condition improvements; largely various initiatives at individual country levels to improve their primary and secondary roads, allowing for faster travel along the network, not just on regional corridors. Additionally, the HA-C assumes more extensive application of digitalisation measures, such as electronic single windows and cargo tracking systems, to reduce delays from cargo clearance processes. Bottlenecks at ports and border crossings are further reduced due to more even application of harmonisation measures across all study region countries. For example, increased cross-border harmonisation between the EAC and Ethiopia, fewer administrative and operational delays for countries in earlier stages of development. The result is more uniform improvements from the implementation of measures such OSBPs compared to the BAU scenario.

Both scenarios assume a natural evolution of vehicle technology for heavy-duty vehicles, with a standard pace of fleet renewal based on the average age of vehicles in the region. Currently, the rail projects underway are expected to be electric (e.g. Tanzania SGR), so future rail expansion is expected to follow the same trend.

The ITF non-urban freight model

This analysis uses the ITF non-urban freight model to assess the impacts of policy measures on freight transport in the study region. The ITF non-urban freight model estimates global freight flows and assigns them to routes, modes, and network links across all major transport modes. This analysis can also be conducted for a single region or country. It integrates international and domestic freight models, using existing trade and transport data for model calibration and validation. The model outputs can be used to evaluate the impacts of infrastructure investments, economic and trade facilitation measures, technological improvements, and environmental measures on freight connectivity (see Figure).

Figure 9. The International Transport Forum non-urban freight model framework



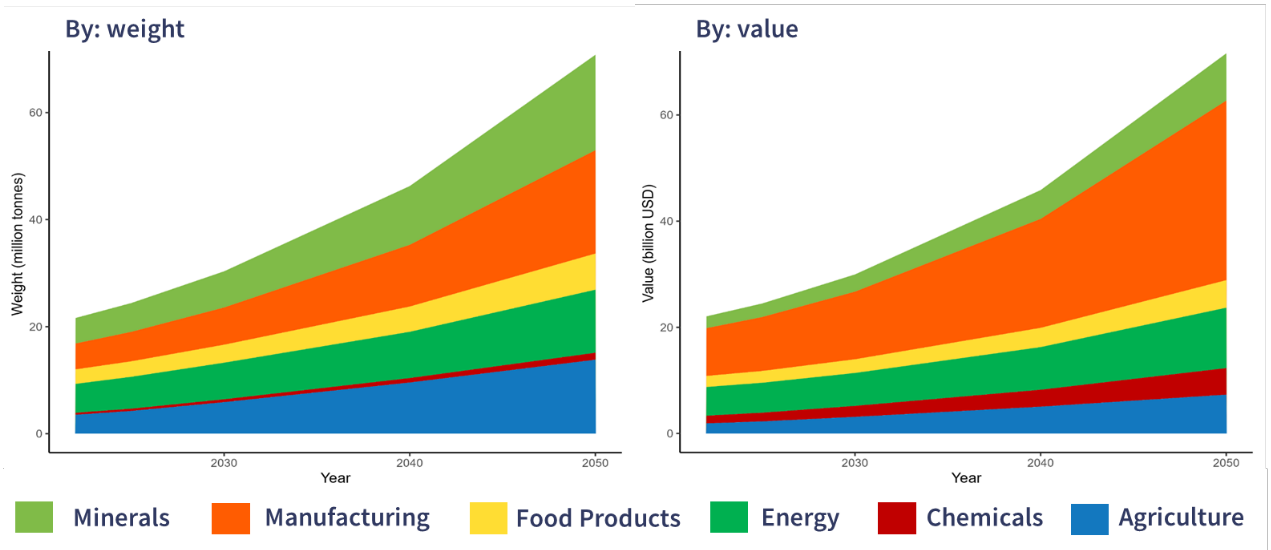
Source: ITF (2023).

Regional freight flow forecasts in East Africa

By 2050, trade in the study region is estimated to triple in weight and value (Figure). It is dominated by weight-constrained commodities, with agricultural products and minerals accounting for over 40% of the total weight of goods traded throughout the study period, but only about 20% of the value of the traded goods. These goods pose difficulties for the efficiency of domestic freight transport, as they represent poor value-to-weight ratios and their movement tends to be unidirectional, creating empty returns from transport hubs back to production centres. The proportion of these commodities is expected to continue to grow until 2050, contributing to 47% of the total gains in trade activity by weight.

By contrast, and representative of the study region's trade imbalance, manufacturing comprises 22% of the trade activity by weight but over 40% by value. Population growth will influence demand for manufactured goods and should the study region continue to rely on manufactured imports, by 2050 it is estimated that manufacturing alone will account for 47% of the total value of goods traded compared to 41% in 2022, representing over half of the increase in total trade value.

Figure 10. Total trade weight and value by commodity in the East Africa study region (2022-50)



Note: The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.

Larger countries will continue to have a higher share of the total regional freight flows, but in general, all the countries in the study region are expected to more-than-double their total freight activity over the next 25 years (see Figure).

Figure 11. Total surface freight activity by country in the East Africa study region (2022-50)

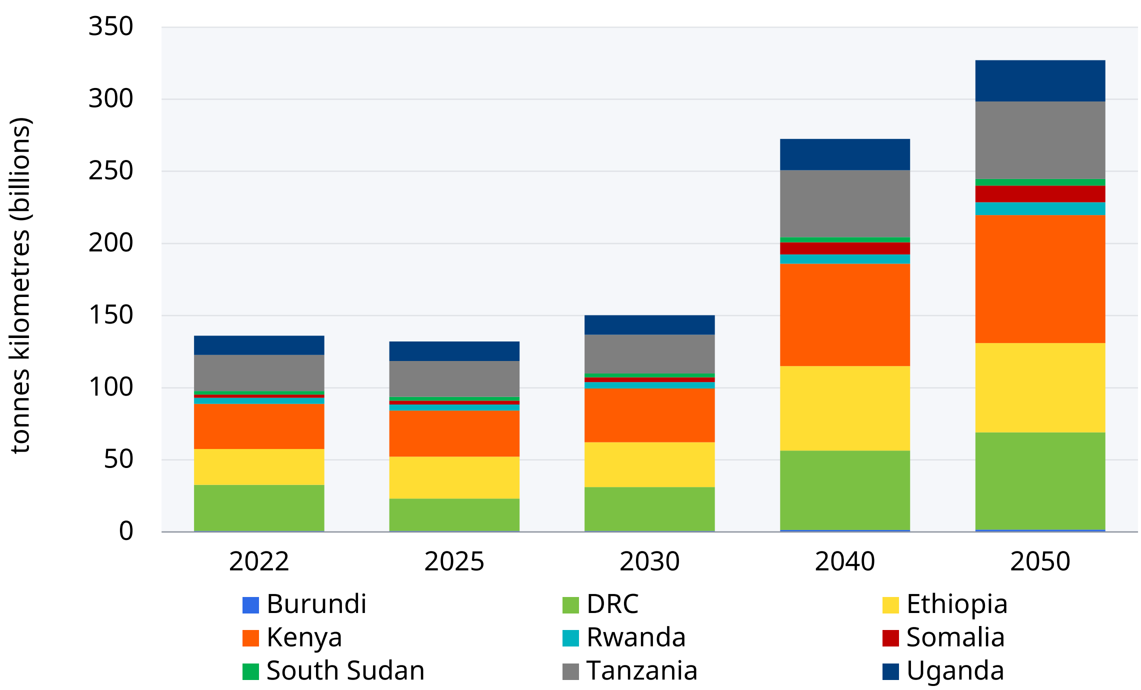
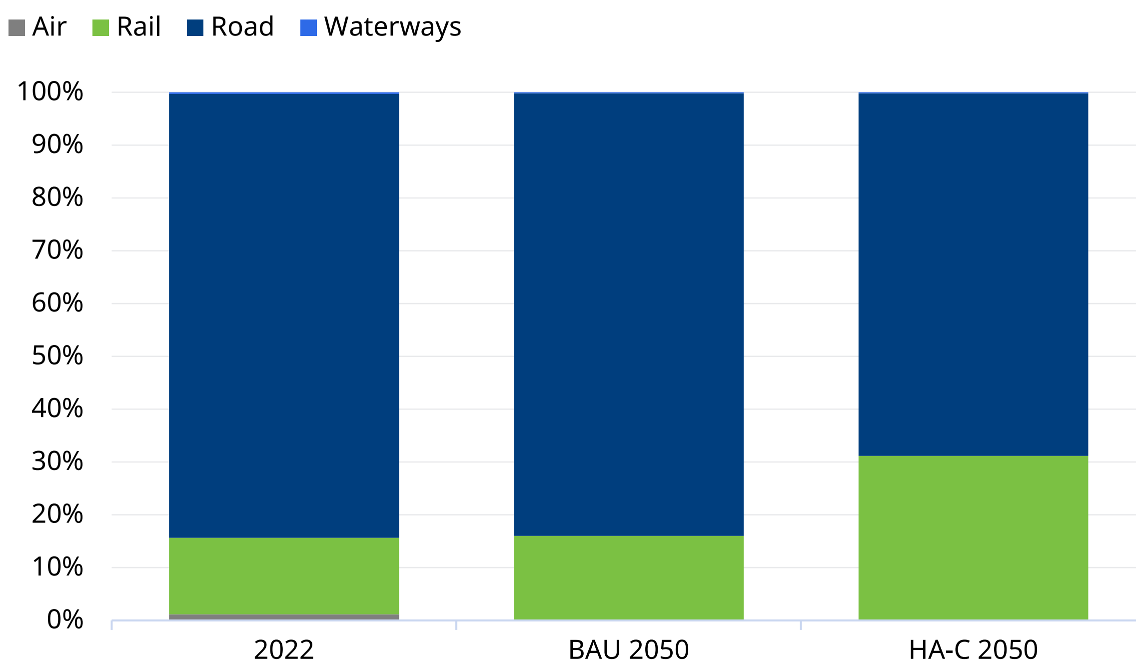


Figure 10 also reflects a common pattern of asymmetry where larger economies are likely to capture greater benefits from trade liberalisation, as well as the realities of the study region's geopolitical context, which influences economic relationships and can be a barrier to trade facilitation measures at the regional level (Hersi, Alaslow and Omar, 2025). Kenya plays a dominant role in East Africa, largely driven by its manufacturing exports to other countries in the study region (Hersi, Alaslow and Omar, 2025). The DRC, Ethiopia and Tanzania are also significant, owing to a combination of size, agricultural and mineral exports, and in the case of Ethiopia, its large population.

Road transport is expected to maintain its position as the dominant mode for goods movement in the study region, even in the HA-C scenario. In 2022, road transport accounts for 84% of all tonne-kilometres in the region, maintaining the same value in the BAU scenario in 2050, but decreasing to 69% by 2050 in the HA-C scenario (see Figure). This can be largely attributed to the extent and density of the network, in addition to the flexibility the mode provides for the types of commodities moving through the region. Both scenarios also take a slightly conservative approach to mode shift, given the barriers to changing modes for operators (especially low-volume shipments that would require consolidation), and the practical challenges for building and rehabilitating all the extensive rail projects in the region all at once.

Figure 12. Freight transport mode by modelling scenario in East Africa study region to 2050



Note: Air and Waterways values represent less than 2% of total freight tonne-kilometres
BAU = business as usual scenario; HA-C = Higher ambition for connectivity scenario.
The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.

National authorities and investments in the regional rail masterplan and the new Lamu Port South Sudan and Ethiopia Transport (LAPSSET) corridor project set ambitious goals to significantly increase rail. However, addressing the extensive maintenance gap and challenges related to funding mobilisation hamper the potential of the mode. Nonetheless, there is an opportunity to shift much of the study region's exports to rail by 2050, given that the mode is particularly suitable for moving bulk commodities over long distances (ITF, 2021a).

Inland waterways will also play a marginally larger role in both the BAU and HA-C scenarios, however, the current limitations to the mode imply significant investments are needed to increase this role. After 2050, however, and given the increase in rail and expected completion of many rail projects, there is potential for intermodal transport between rail and inland waterways in the region, particularly at Lakes Victoria and Tanganyika. The role of air decreases substantially in both scenarios, owing primarily to the cost of the mode, as well as its environmental impacts. As travel times on road and rail improve and with increasing investments in cold chains, the time advantage for air freight for high-value commodities decreases.

The study region's freight activity is already concentrated along key corridors, and with increasing trade volumes, this phenomenon will become even more pronounced (see Figure). In the BAU scenario, by 2050, the Northern corridor is particularly prominent for both road and rail freight activity. Given already significant bottlenecks on the corridor for both modes, the increase in trade volumes is likely to exacerbate these issues. Notably, even the BAU scenario assumes a much greater role for rail by 2050. Without measures to improve intermodal connectivity and addressing last-mile issues, increasing the uptake of rail will be difficult. Increasing freight rail use is crucial to decongest the road corridors and border crossings.

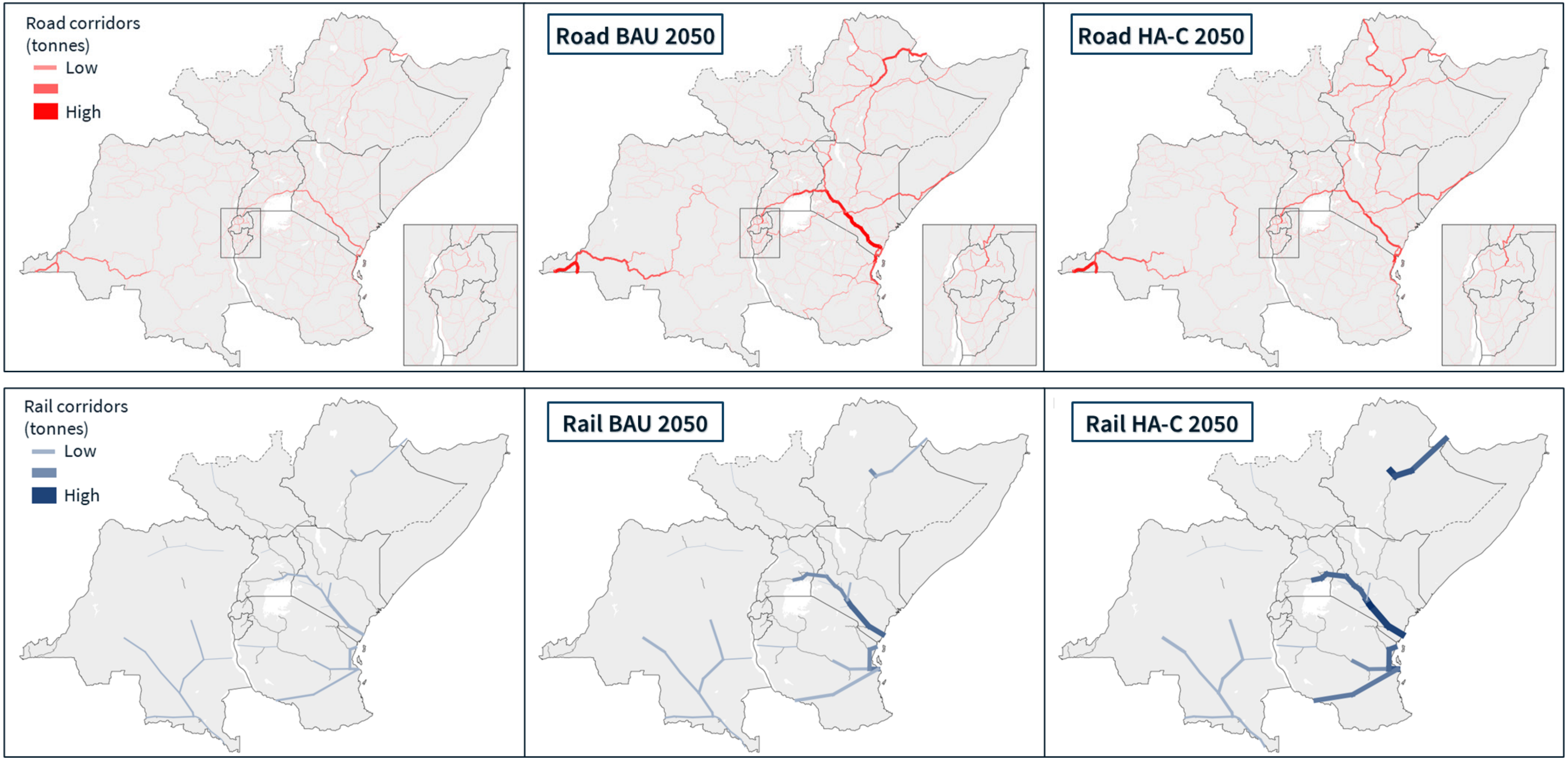
Road conditions at key nodes (such as border crossings and port access locations) can be significant sources for delay. Such delays increase fuel consumption and emissions given the volume of heavy-duty vehicles at these locations. In 2050, with the tripling of freight activity, these challenges will become more notable. Targeting road condition improvements at these locations can have a significant impact on overall travel times, and on road safety and sustainability issues. Improving road conditions at key bottleneck locations also complements regional priorities and investments, and facilitates regional integration.

More efficient border clearance times and increased port capacities can be made proactively, so that improvements at nodes are not constrained by limitations in the road network. One such example is the Hargeisa bypass project, which connects to the Berbera port. The 22.5 km bypass has resulted in a 39% decrease in travel times in the return trip from the Berbera port to the border town of Tog Wajaale, a trip that was on average ten-hours long before the bypass (TradeMark Africa, 2023). It is also necessary to address concerns related to congestion near the port that cause access issues for the hinterlands. As a result of these network improvements, in 2050, this link is expected to become a more prominent corridor for freight to Ethiopia in both scenarios.

There are fewer constraints on the road network under HA-C due to a greater role for rail. This is evident in the connection between Tanzania and Zambia (along the Tazara rail line), and on the Ethio-Djibouti and Northern corridors. The HA-C also includes a slightly more conservative growth of rail volumes along the Central corridor compared to the BAU and other corridors, mainly attributed to the completion of the SGR. The HA-C assumptions for rail reflect the potential for greater development in the region while considering the intermodality and last-mile connectivity challenges that rail faces, including between different gauges, and to destinations. For example, in Tanzania along the Central corridor, excessive turnaround times currently decrease the capacity of rail to about 25% of its potential capacity (CCTTFA, 2023). Addressing these issues will be necessary for the HA-C forecasted mode shares to materialise.

Secondary roads play a notable role by 2050 under HA-C, and freight volumes are more balanced across the network and less concentrated along selected corridors. Better connectivity and access for local networks improve market access for micro and small enterprises in the study region, but fostering this market access for potentially low-volume shipments and likely dispersed distribution patterns will require some level of consolidation and investment in facilities such as warehouses and cold storage facilities. This requires associations of private logistics providers to compile their stakeholders and facilitate co-ordination for asset sharing. While the region's corridors will continue to play a significant role, the improvements in local connectivity will better distribute freight flows and the resilience of the freight network in general.

Figure 13. Domestic and international freight volumes by road, rail and modelling scenario in East Africa study region



Note: BAU = business as usual scenario; HA-C = Higher ambition for connectivity scenario.
The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.

Measuring connectivity for countries in the East Africa study region

Most of the study region's current trade partners are outside the region, highlighting the importance of being able to access those markets effectively. Improving connectivity with those countries implies improving access to global markets both in terms of travel time and costs. Various factors influence connectivity, including transport costs and infrastructure availability. Additionally, distance, geographic factors and global economic concentration (i.e. centres of production and consumption) influence the amount of time and the cost to reach markets. For example, access distance to ports and geography influence the connectivity of landlocked countries to reach global markets. Similarly, economic concentration means that, for example, a German manufacturer is closer to a larger share of potential markets, given the proximity of Germany to other high-GDP European countries. Countries with limited high-quality infrastructure, landlocked countries, and countries that are far from global centres for production and consumption, thus usually have higher transport times to access a majority of global GDP.

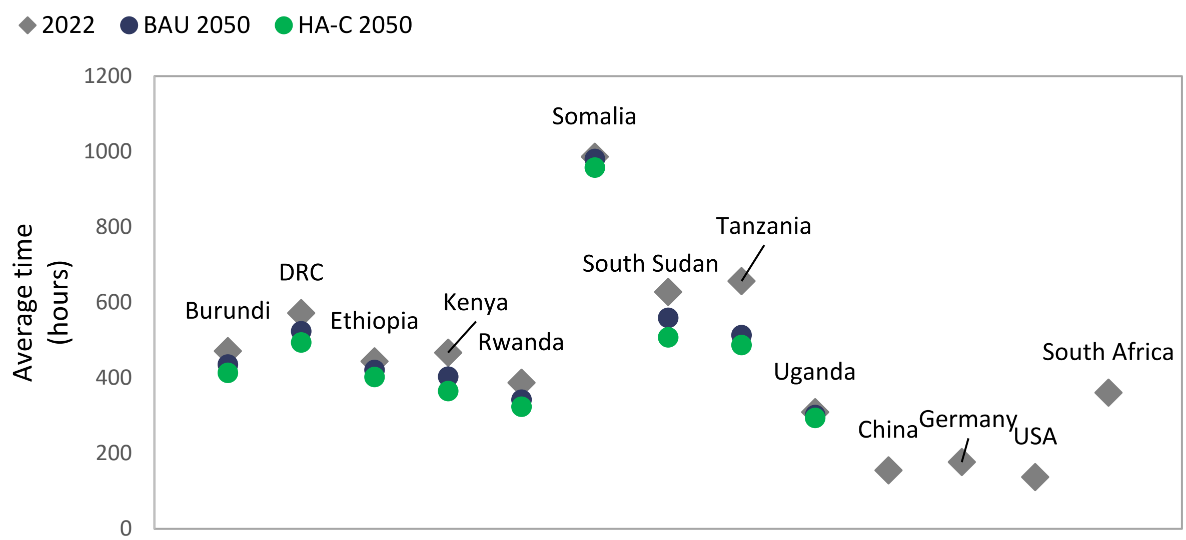
Figure and Figure compare the time and transport costs (respectively) to reach 75% of the global GDP from each of the countries in the study region. They compare current levels, to the BAU and HA-C scenarios in 2050. Both figures also compare the countries in the study region to countries that perform well in terms of access to global markets – in this case, China, Germany, the United States, and South Africa.

However, measuring time and transport cost to markets can be complex. The 75% GDP threshold selected represents a majority of the global GDP, and, thus, potential markets. It is worth adding the caveat that 75% is not a hard cutoff, and that in some cases, reaching the threshold can also mean exceeding it. The indicators do not include the GDP of the origin country, so individual shippers within each origin country can potentially reach a larger share of global GDP in less time or for a lower cost.

Access to ports, and the performance of ports is significant because achieving a larger share of global GDP requires leaving the continent, meaning the modes used influence the time and transport costs. The average time for a country like South Africa, which is far from centres of production and consumption, will therefore be much higher because of their heavy reliance on maritime transport, which is a generally slower mode.

Figure shows that travel time to markets is higher on average for the countries in the study region compared to countries with high-quality infrastructure and better access to global markets. Over time, with higher trade volumes and hence more pressure on the network, these times are expected to increase. However, given that transport networks in the study region are expected to improve over time from current conditions, even with BAU policies, and that the study region's relative global GDP share is also expected to grow, travel time to reach the GDP threshold actually decreases. This assumes that the committed infrastructure improvements in the BAU scenario are delivered. Under HA-C policies, improvements are expected to be even more significant.

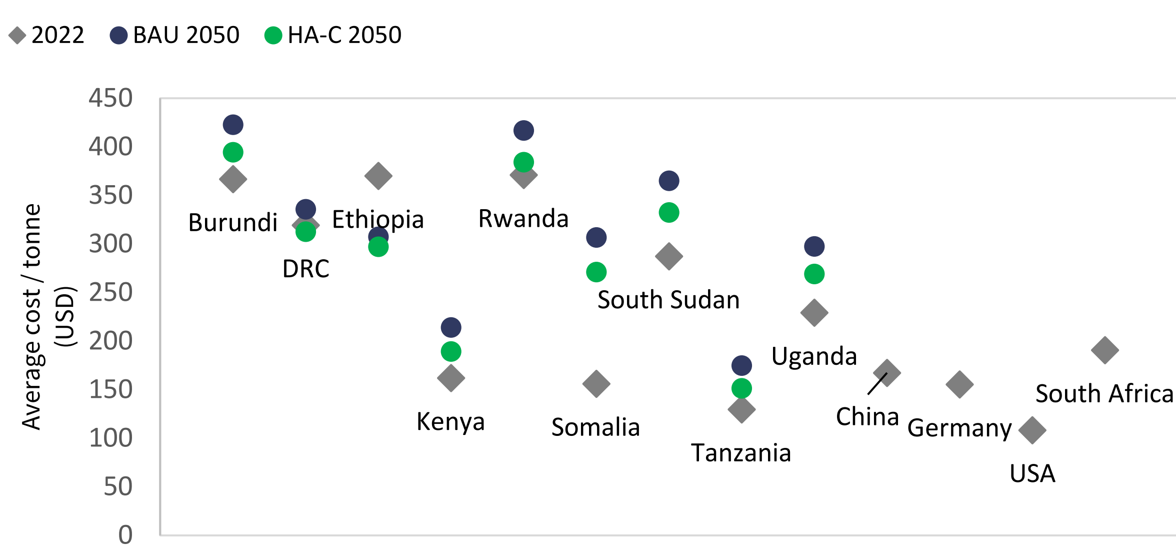
Figure 14. Average time to reach 75% of global GDP per modelling scenario



Note: BAU = business as usual scenario; HA-C = Higher ambition for connectivity scenario.

The outcome becomes more complex for costs. Transport costs in the study region are already high. Further, due to economic growth, labour costs are likely to increase over time. This means that by 2050, costs throughout the study region are likely to increase in both scenarios (see Figure). However, costs will likely be lower for the HA-C compared to the BAU scenario. This is largely attributed to ambitious measures that will improve the efficiency of trade within the region and infrastructure improvements that will lead to improved travel times compared to the BAU scenario. Notably for Ethiopia, the diversification of its trade routes (from heavy reliance on the Ethio-Djibouti corridor) drive costs down by 2050 in both scenarios.

Figure 15. Average cost per tonne to reach 75% of global GDP per modelling scenario



Note: BAU = business as usual scenario; HA-C = Higher ambition for connectivity scenario.

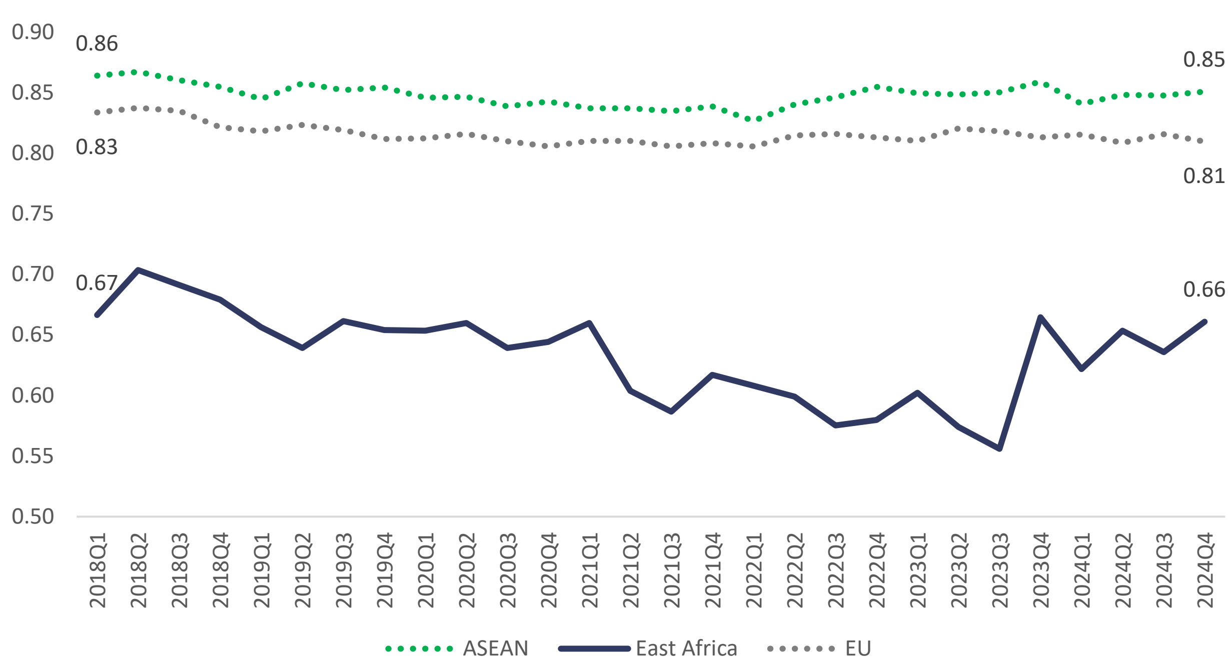
Importantly, reducing times and costs to reach more markets outside of the region also implies improvements in travel times and costs within the region, which can be a means to improve intra-regional trade. However, given that maritime connectivity plays a large role in this measure, it warrants additional considerations.

Maritime connectivity and its role in reducing freight times and costs

Maritime market concentration is growing, and shipping alliances have resulted in more route consolidation, reducing direct services in favour of more profitable hub and spoke operations (ITF, 2018). This means that for countries in the study region relying on only one port, they may have even fewer options for direct connections to markets, impacting both the resilience of their supply chains and their trade costs. Direct connections between countries boost export values, and each additional transshipment is associated with a reduction in export value of nearly 20% to 25% (Humphreys et al., 2019).

To better understand how external trade is directly connected to markets, it is valuable to measure the share of international trade (by ship) carried on direct connections between countries and their trade partners (ITF, 2024). The Maritime Trade Connectivity Indicator (MTCI), developed for an ITF Roundtable on Transport System Resilience, compares this access to direct maritime connections for the world, and finds that Sub-Saharan African countries have the lowest MTCI scores globally (ITF, 2024). An MTCI score of 1.00 would mean that all of the international trade (by ship) of a country is directly connected to the ports of the countries with whom they trade (so without transhipment). The average MTCI score for the study region countries hovers around 0.63. Compared to ASEAN countries and European Union countries, there are also larger variations in the score, but overall there is a slight declining trend due to changing operations in the sector (see Figure).

Figure 16. Maritime trade connectivity score



Notes: Methodology for calculating the MTCI is available in ITF (2024).
Source: Adapted from MDS Transmodal Containership Databank (2025).

Improving maritime connectivity for the region should thus focus primarily on bettering access connections to ports to increase redundancy in terms of route alternatives, mainly because costs in the sector are influenced by increasing market concentration. However, at a regional level (and ideally globally), there is an opportunity for the adoption of common principles for port pricing to help to offset the monopsony power of alliances (i.e. to reduce the bargaining power imbalance between alliances of shippers and ports who are dependent on them) and support sound project analysis in cases where new facilities are proposed to accommodate mega-ships (ITF, 2018).

East African freight sustainability and resilience

Transport uses finite resources, most notably, energy and space. Transport activity contributes to greenhouse gas (GHG) emissions and local pollutants, and to congestion and road safety issues in communities (ITF, 2025). Given the urgency of the climate crisis and the impacts of transport activity on liveability, the sustainability of transport systems, including freight transport systems, is a necessary priority for decision-makers interested in meeting current and future transport needs while maintaining reliability and cost-effectiveness.

The climate emergency is just one of many simultaneous crises that transport systems currently face. Enabling the movement of people and goods, transport systems are by nature interconnected with other domains, making them vulnerable to disruptions both within the sector and outside of it. The study region faces disruptions related to external factors such as pandemics and geopolitical tensions, in addition to climate challenges. Freight transport, as a system, is also interconnected at different geographic scales – globally, regionally, and locally. This means that local disruptions can have cascading effects (ITF, 2024). To address the challenges these issues create for resilience, decision-makers are tasked with finding strategies to improve various systems' capacities to deal with, adapt to, and recover from disruptions (ITF, 2024).

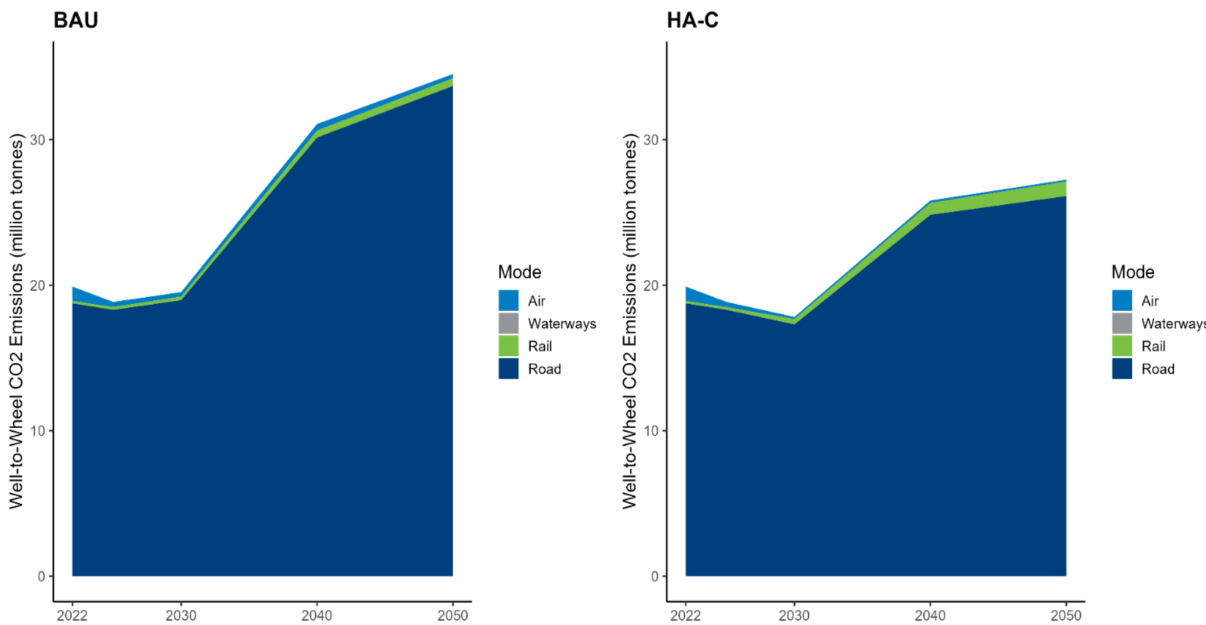
Thus, meeting current and future freight transport needs, improving connectivity, and maintaining reliability and cost-effectiveness require consideration for both sustainability and resilience. The attributes related to freight connectivity also have the potential to impact the sustainability and resilience of the movement of goods (McKinnon, 2024b). For example, the total freight demand and how it moves impacts on sustainability in terms of the emissions from freight activity, and on resilience, in terms of availability of routing options. Other attributes influencing sustainability and resilience, and their potential impacts on freight activity in the study region are discussed in the following sub-sections.

Reducing freight transport emissions in the East Africa region

GHG emissions from freight transport are driven by demand, that is, the level of activity required to meet the needs of domestic and international trade in each country. A direct relationship is often established between a country's GDP growth and energy consumption in the transport sector (McKinnon, 2024b). This relationship is often difficult to separate and requires a shift from inefficient and high-emission systems to sustainable transport systems. Decoupling emissions from freight transport activity presents significant infrastructure, logistical, co-ordination, and technological challenges that require human and financial resources.

The dominance of road transport for the movement of goods shapes emissions in the study region. By 2050, under the current ambitions (BAU scenario), emissions are expected to grow by 73% (while transport activity will increase by 140%), with a vast majority of the increase generated by road transport activity. By comparison, with higher ambition policies to improve connectivity (HA-C scenario), total emission growth over the same period is about half, at 37% (while transport activity will increase by 130%). This is a significantly larger difference than is seen in the total transport activity which is estimated at 5% lower in 2050 for the HA-C scenario compared to the BAU scenario. (See Figure)

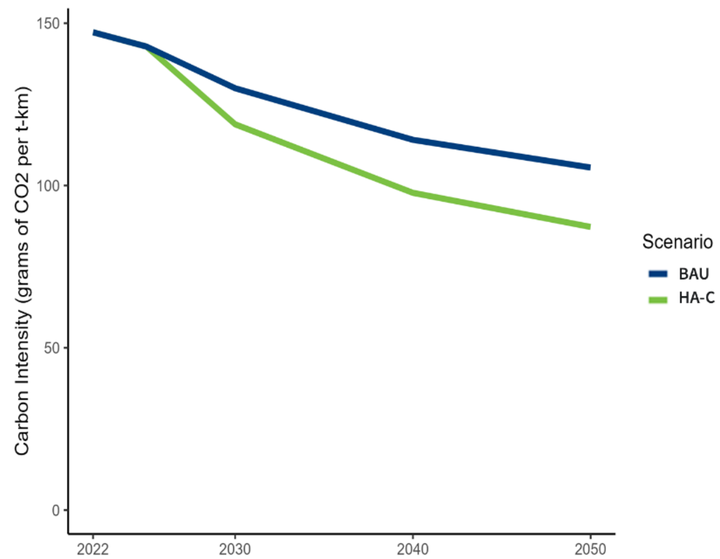
Figure 17. Emissions by freight transport mode and modelling scenario in the East Africa study region (2022-50)



Note: BAU = business as usual scenario; HA-C = Higher ambition for connectivity scenario.
The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.

The gap between scenarios is achieved by shifting 15% of freight transport activity from road transport to rail, as the rail network is further expanded in the region. In both scenarios, all modes of transport experience improvements in carbon efficiency given the assumed technology evolution and related vehicle efficiency gains. Despite this, road remains the most carbon-intensive mode by far, producing over ten times more carbon per tonne-kilometre than rail. As a result, while carbon intensity in the region consistently decreases in both scenarios from the base year of 2022, by 2050 the two scenarios diverge substantially, with lower carbon intensity per tonne-kilometre in the HA-C scenario as a result of the higher rail uptake (Figure).

Figure 18. Carbon intensity of freight activity by modelling scenario in the East Africa study region (2022-50)



Note: BAU = business as usual scenario; HA-C = Higher ambition for connectivity scenario. The study region includes: Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda and the United Republic of Tanzania.

Challenges for emissions reduction in the region

Achieving the 15% shift from road transport to rail in the HA-C scenario will face various challenges. These challenges include infrastructure availability, modal integration, and operating practices that may hinder the mode shift. Policies that consider these challenges can be more effective in generating the mode shift in the high ambition scenario.

The characteristics and condition of infrastructure, including its redundancy, impact energy consumption in transport. Poor road infrastructure can increase the number of stops, accelerations, and detours, which increases fuel consumption in heavy-duty vehicles. For example, the Northern Corridor Transit and Transport Coordination Authority (NCTTCA) has identified that ten routes contribute to 86% of the estimated road freight transport-related emissions along all its routes in three of its member countries (Kenya, Rwanda, Uganda), largely due to congestion (NCTTCA, 2025b). Investing in infrastructure maintenance and developing alternative routes helps to improve travel times and significantly reduce road transport emissions. Traffic and operations management and planning, especially at bottleneck locations, such as border crossings and port and inland container depot access roads, can reduce delays and as a result, emissions. However, to tackle emissions from freight transport, it is necessary to consider the potential of other modes.

The mode shift away from road to rail and inland waterways implies the expansion of these networks, which is often slow and costly. However, these modes are well suited to capturing demand in specific market niches, such as mining, forestry, and agricultural raw materials, as well as containers. These are the main commodities being transported for the study region, increasing the potential appeal for these modes.

However, rail and inland waterways can lack the flexibility in terms of first- and last-mile access that some value chains currently require, often relying on intermodal hubs. One challenge with intermodality is that it requires greater co-ordination, which can be challenging based on the structure of the logistics service providers in the study region. A majority of the operators in the region are small and medium-sized enterprises, often competing for the same types of cargo. While integration and intermodality would potentially reduce emissions via asset sharing and better co-ordination of transport stages, it also requires co-ordination between modes and logistics actors.

Additionally, depending on the kinds of commodities being transported, tail and inland waterways can have a higher incidence of empty returns than road, increasing costs. The proportion of empty vehicle kilometres (vkm) travelled (equivalent to 100 km of freight) has a direct impact on emissions per unit transported. Vehicles running with low payloads, or empty trips known as empty returns, are a significant source of energy inefficiency.

By way of comparison, in Europe and the United States, empty returns represent 20% of vkm, while in Argentina and other raw material-producing countries with imbalances between imported and exported volume, it is close to 50% (ITF, 2022). In the study region, the last survey performed by the NCTTCA indicated 45% of empty returns (NCTTCA, 2025b). Reducing this proportion through collaborative logistics networks, freight exchanges, intermodal planning, or agreements between operators can improve vehicle utilisation and reduce their environmental impact without the need for major technological investments.

However, the nature of the commodities being transported in the study region presents an additional challenge for this measure. Specifically, the “mixability” of the commodities being transported makes asset sharing more challenging (i.e. primary commodities are more prone to empty returns compared to manufactured goods, and also typically use different vehicle types) (ITF, forthcoming). Nonetheless, even with the current modal balance, greater asset utilisation can reduce freight emissions.

While improvements to infrastructure and intermodal transport options could have a strategic impact in reducing freight transport emissions in the region, given the dominance of road transport, vehicle technology and vehicle operations will still play a critical role in decarbonising the transport of goods.

Strategies to improve freight sustainability

Separating emissions from freight transport activity in the study region will require identifying opportunities to reduce emissions from road transport. Selecting the appropriate measures for the study region will require data collection and transparent reporting on vehicles and their fuels and operations and transport network inefficiencies, discussed in more detail in the next section.

The median age of sampled trucks is seven years in Uganda, nine years in Kenya, and six in Rwanda, which suggests that newer vehicles are in use in these countries; however, the overall fleet remains outdated (the reported national average age of trucks is 15 years for these three countries), contributing to higher emissions (NCTTCA, 2025b). In Ethiopia, about half the cross-border truck fleet is at least 10-years old, and 16% of vehicles are older than 20 years (Ministry of Transport and Logistics, 2024). Older vehicles, especially those with outdated technologies or without emission controls, tend to generate higher levels of pollution per kilometre travelled. Furthermore, poor maintenance, including dirty filters, underinflated tires, or deteriorated fuel injection systems, increase fuel consumption and the risk of collisions. Fleet renewal and preventive maintenance programs are good strategies to mitigate these problems.

Cleaner or hybrid technologies, and the transition to renewable energy sources, have significant potential to reduce the level of particulate material and greenhouse gas emissions from road transport. This is especially the case when accompanied by incentive/ban policies, encouraging the manufacture or import of more modern, less-polluting engines and banning older ones without emission controls. Regulations on emissions, fuels, and vehicle technology can accelerate the adoption of cleaner solutions, while their absence often prolongs polluting practices. Tax incentives, subsidies, or financing can facilitate the transition to cleaner vehicle technologies.

Penalties and incentives must be balanced. For example, the Ethiopian government has banned the import of internal combustion engine vehicles, but without incentives to update the existing fleet, such a policy may result in the retention of higher-emitting vehicles and prevent newer, more efficient internal-combustion vehicles from entering the country. Considering the uptake of electric heavy-duty vehicles (e-HDVs) globally, the import ban may not significantly improve freight emissions in the short term. More permissive policies, such as waiving import duties for electric and hybrid HDVs, and lowering the maximum age for vehicle imports can encourage fleet turnover. Additionally, the technical needs for electric vehicles (charging stations availability and distribution, electric grid performance, repairing facilities and skilled labour force) can determine penetration rates in developing economies, and should be considered in tandem with fleet renewal policies.

Beyond fleet renewal, some potential quick wins for emissions reductions in the region can include driver and operator training to improve operational efficiencies. The organisation and co-ordination of transport operations directly impacts energy consumption and emissions. In the study region, trucks are estimated to be moving for only about 36% of the total travel time, and queueing for nearly one-third of the rest of the time (including port queues, police controls, weighbridges and border posts, among others) (Eberhard-Ruiz and Calabrese, 2018). Optimised management allows for reduced kilometres travelled, higher load factors, and lower emissions. Driving habits also have a significant impact on emissions. Practices such as harsh acceleration, constant braking, or excessive speeds increase fuel consumption and, consequently, emissions. Conversely, efficient and anticipatory driving can reduce fuel consumption by up to 15%. Eco-driving training is a simple but effective strategy for quickly generating positive impacts (ITF, 2021c).

The Northern Corridor Management Institution already provides eco-driver trainings as part of its Green Freight Strategy (see Box 4). Expanding driver trainings, and including programmes related to professionalisation, especially for micro and small enterprises can also be an opportunity to improve operating practices within the sector. Such programmes can include collaboration with the private sector and member-based logistics service provider associations to encourage the participation of smaller enterprises.

A higher uptake of fleet management systems can be effective but the investment in such systems may be out of reach for some smaller enterprises. Although challenging, given the atomised structure of the logistics service providers in the region, there may be opportunities for member-based operator associations to support some of these measures, including co-ordination amongst operators for route optimisation, asset sharing and fleet management. Such measures can deliver concrete results and boost legitimacy to pave the way for more complex medium and long-term policies to reduce freight transport emissions in the region. They can also complement larger financial investments in infrastructure, ensuring more efficient infrastructure utilisation and higher rates of return on investment.

Box 4. Northern Corridor Green Freight Strategy

The Northern Corridor Green Freight Strategy for 2030 sets the objective of building resilience against climate impacts to ensure that its freight system remains robust and adaptable in the face of a changing planet. The vision of the strategy is a safe, competitive and environmentally sustainable corridor. It sets ambitious goals for the corridor, including:

- electric-vehicle readiness by 2030
- implementing eco-driver training for 1 000 drivers
- improving the fuel efficiency of freight transport by 10% by 2030, compared to 2024 levels
- reducing emissions of particulate matter (PM), black carbon, and nitrogen oxides (NOx) by 12% by 2030, compared to 2024 levels
- reducing CO_2 emissions intensity by 10% by 2030 when compared to 2024 levels
- enhancing the climate resilience of at least 2 000 kilometres of roads.

The strategy prioritises collaboration among stakeholders, focusing on no-regret short-term actions. These include a Green Freight Capacity Building initiative, driver and fleet manager training schemes, the development of an emission quantification methodology and a monitoring plan, a truck operator labelling scheme, technology demonstration, verification, and rollout and the regulation of the import of old inefficient trucks (among others).

The strategy also acknowledges the need for regional collaboration considering a “Common Borders, Common Solutions” approach, but the success of this strategy hinges on the active participation and collaboration of all member states, including its public, private, and scientific stakeholders on green freight initiatives. Another relevant pillar of the strategy is the corridor emission data collection, setting the 2024 emissions baselines. This allows regular tracking and reporting on the effectiveness of measures such as the training of truck drivers on eco-driving, and awareness campaigns on GHG emissions control (NCTTCA, 2025b).

Source: NCTTCA (2024b).

Implementing freight sustainability policies

The success of these strategies in the region will rely on partnerships between official stakeholders and the assurance of high-level political support. Regional institutions, such as the East African Community (EAC), will play a role in garnering this support, establishing shared minimum standards, developing common training curricula and regional certifications, and facilitating technical co-operation. Taking a regional approach can also reduce costs by streamlining efforts to avoid duplication.

Selecting the most relevant sustainability measures will require understanding the region’s current baseline emissions, to measure the impact accurately. This is a challenge in the region, given the frequent lack of emissions data, and the prevalence of smaller enterprises for whom data collection and reporting may be a challenge. Emissions data can be helpful for logistics operators and be used to identify operational efficiency opportunities. In the study region, the corridor management institutions are well positioned to lead such efforts, in collaboration with relevant stakeholders. The NCTTCA is already actively collecting and reporting emissions data on its corridor as of 2024, and there is an opportunity to align their emissions accounting with industry standards, allowing for global benchmarking. The Green Freight Support Program in Eastern Africa (Box 5) is one such initiative.

Box 5. Green Freight Support Program in Eastern Africa

In July 2023, Smart Freight Centre and Kuehne Climate Center embarked on a scoping study to determine the feasibility of a green freight programme in Eastern Africa. Following a year of stakeholder led consultative meetings, the Green Freight Support Program in Eastern Africa was officially unveiled in August 2024 at the Global Logistics Convention in Dar es Salaam, Tanzania.

Its direction is aligned with key partners of The Northern Corridor Transit and Transport Coordination Authority of Eastern Africa and The Central Corridor Transit Transport Facilitation Agency. The programme aims to achieve efficient, low emissions, safe and inclusive freight. This will be done by harnessing five anchor areas: ecosystem establishment, capacity development, emissions transparency, fleet efficiency, and the introduction of electric trucks.

Since the programme's inception, it has cemented its presence in the region by strengthening industry partnerships and fostering collaboration among logistics associations, shippers, and regional actors. Through joint efforts with partners, capacity-building workshops have been held across Kenya, Tanzania, and Uganda. Such workshops deepened the thematic focus of logistics emission accounting principles, eco-driving, fleet management, and road freight net zero to raise awareness on sustainable logistics and freight. Moreover, an electric truck pilot rollout is underway to demonstrate the viability of zero-emission transport in the region.

One of the fastest progressing workstreams is on emissions transparency. To achieve emission transparency and accelerate green freight development, establishing a baseline for emissions is critical. By using two key performance indicators of *emission intensity values* (emissions per transport activity) and *fuel emission factors* (emissions per unit of energy source), baseline emissions can be understood, thereby illustrating carbon impact of any logistics operations. The current Global Logistics Emissions Council Framework, an industry standard methodology for logistics emissions, does not yet incorporate emission intensity values and fuel emission factors for East Africa. Therefore, it is vital to expand the key performance indicators and to depict on-ground operations realistically, based on the regional context. The implementing team has finalised a scoping study to understand data availability and begun developing emission intensity values and identification of fuel emission factors specific to Eastern Africa.

Moving forward, the Green Freight Support Program in Eastern Africa will further enhance its strategies, expand pilot initiatives, and strengthen collaboration with key stakeholders to drive the shift toward a zero-emission, safe, and efficient freight system in the region.

Source: Smart Freight Centre and Kuehne Climate Center.

Such initiatives are an opportunity to deepen regional collaboration by sharing experiences, information, and best practices. The countries in the study region have common challenges (dependence on road transport, infrastructure gaps, informal cross-border trade) and policy priorities with respect to sustainability. Each country may have different solutions or approaches to informal/local logistics, and sharing these lessons can accelerate improvements. It would allow successful experiences to be adapted to similar contexts.

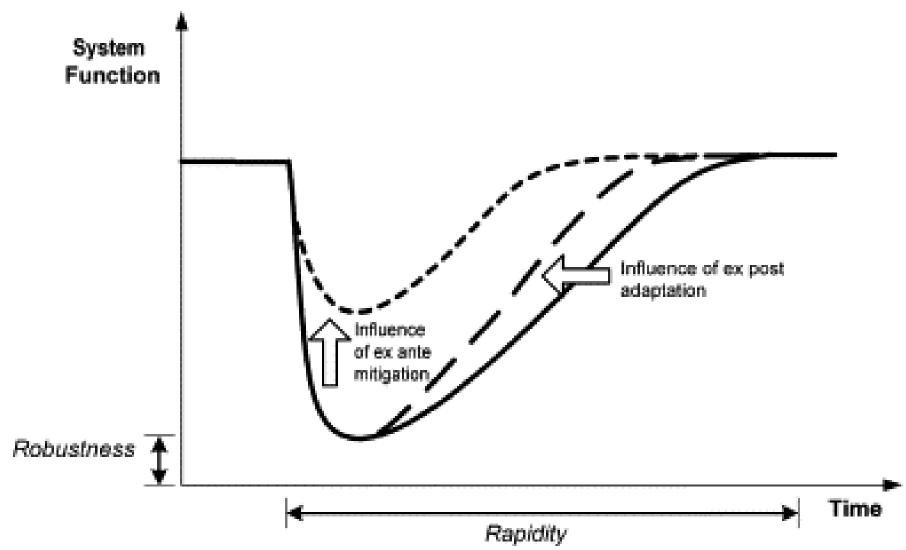
For the individual countries, there are also opportunities to strengthen linkages between sustainability measures and their nationally determined contributions (NDCs). All the proposed measures can be integrated into the NDCs, as they are short-term, measurable, and scalable actions. For example, goals such as “train 50% of formal drivers in efficient driving techniques by 2030” can be included. It could improve coherence between national climate policies and concrete actions in the transport sector, which is often poorly articulated (ESCAP, 2025).

Enhancing freight resilience in East Africa

This subsection describes disruptions that influence the resilience of freight in the study region. It provides an overview of strategies to enhance freight resilience in the study region, lessons from past disruptions and demonstration of how investments to improve connectivity can also improve resilience.

Resilience in freight transport refers to the ability for supply chains and logistics networks to withstand, adapt to, and recover from external shocks and disruptions, while maintaining efficient goods movement. In general, improving connectivity also improves the resilience of freight transport systems (McKinnon, 2024a). Two key aspects of resilience are *robustness*: referring to a system’s ability to provide additional and alternative capacity to absorb the effects of a disruption; and, *rapidity of recovery*: referring to the time it takes for a system to recover to its level of service pre-disruption (see Figure) (ITF, 2024).

Figure 19. A transport system’s preparedness for disruption



Source: McDaniels et al. (2008).

Robustness and *rapidity of recovery* are related to both the physical network and freight operations. The study for this report largely focuses on the physical network’s resilience. It considers attributes such as the availability of alternative routes or modes and their conditions (e.g. redundancy), the average utilisation of the network (volume to capacity ratios), and the modal split of freight activity. These attributes are also relevant when measuring connectivity and sustainability (McKinnon, 2024a).

Resilience challenges for freight transport in study region of East Africa

The study region faces disruptions related to external factors such as climate risks and geopolitical tensions. The region is prone to drought-flood cycles, which impacts transport infrastructure and the movement of goods. The region's coastal areas are also at risk of rising sea levels and more frequent and higher-intensity storms, placing port infrastructure at risk.

These disruptions are already a reality in the region. They contribute to higher transport costs, cause shortages which can propagate along supply chains, and trigger indirect economic losses for households who may be subject to price increases (Colon, Hallegate and Rozenberg, 2019). In Tanzania, a 2019 study estimated that nearly half of all losses from power, water and transport disruptions could be attributed to disruptions to transport networks from rain and floods, amounting to approximately 0.9% of the country's GDP (Richardson et al., 2022). In Kenya in 2024, a section of the Lamu Port-South Sudan-Ethiopia Transport (LAPSSET) corridor road from Lamu Port was destroyed by floods, resulting in an extended closure that stranded hundreds of trucks on the route to Ethiopia from the port (Mumbi, 2024). For Ethiopia, which relies on the port of Djibouti for nearly all of its trade, access issues to Lamu port significantly reduce its redundancy.

The Ugandan town of Elugu, situated at the border with South Sudan where the Elugu/Nimule one-stop border post (OSBP) is located, frequently experiences flooding events that displace residents and disrupt the movement of goods (Lamot, 2023). The Elugu/Nimule OSBP is the main entry point for cargo into South Sudan from the Mombasa Port along the Northern Corridor designated routes. Crossing times at this border are already over two days long, in part due to border congestion, insecurity along the route, and poor road conditions (NCTTCA, 2025a).

The study region's over-reliance on road transport is also a challenge for the resilience of goods movement, beyond these external factors. This challenge is compounded by the conditions of the road network, which is unpaved or in poor condition in some areas. This is the case along major sections of roads to Juba in South Sudan and in the eastern regions of the DRC, even along designated regional corridor routes (NCTTCA, 2024a).

Digital infrastructure plays an increasingly important role in freight efficiency and facilitating trade. However, digital systems are also at risk of cyber-attacks, especially considering the strategic importance of transport infrastructure (ITF, 2024). Decision-makers should also consider cybersecurity measures while working to harmonise digital infrastructure across the continent to facilitate trade liberalisation.

Currently, approximately 84% of freight moves by road transport in the study region scenario (see Figure). The shares are even higher in smaller landlocked countries like Rwanda and Burundi. Even with the investment in rail expansions, by 2050, the vast majority of freight will still move by road. Reliance on a single mode can impact the rapidity of recovery, particularly in areas with less dense road networks or a high share of roads in poor or unpaved conditions. In these instances, taking alternative routes can significantly increase distances and costs.

Strategies to enhance freight resilience in East Africa

To maintain efficient goods movement it is necessary to implement mitigation (*ex ante*) and adaptation (*ex post*) measures to improve the resilience of the transport system to disruptions in the study region. This requires embedding the concepts of resilience in transport decision making and mainstreaming it in policy documents.

Mitigation strategies for freight disruptions

Regional authorities have identified the need to assess the susceptibility of critical infrastructure to hazards, and to standardise the mapping of these hazards. Assessing the susceptibility of critical infrastructure to hazards at the regional level depends on data and institutional capacity. This may require a top-down approach, because it a system-wide analysis across a multimodal network. In addition to identifying and assessing hazards to critical infrastructure, authorities must plan measures to either retrofit existing networks to reduce the impacts of disruptions or increase the redundancy of networks by providing alternative options.

However, implementing mitigation strategies requires mobilising funding and investment for infrastructure, which can present challenges. The costs of borrowing for African countries tend to be high, with unfavourable lending terms often due to inflated perceptions of risk (Fofack, 2021). The result is high debt servicing burdens, which in turn constrain growth and delay the implementation of necessary infrastructure (UNDP, 2023). Additionally, the levels of official development assistance (ODA) have been declining, and ongoing geopolitical tensions are likely to continue to affect this funding source, which can impact resource mobilisation for infrastructure investment (UNCTAD, 2025a).

Decision makers need evidence-based prioritisation mechanisms to get the most return from their investments, given the constraint of limited funding sources. Infrastructure investment appraisal processes can consider resilience (e.g. creating alternative routes or options, protecting critical infrastructure). In general, system-wide analyses should inform the highest benefits and most cost-effective investments at the regional level – and should be led by regional institutions.

However, balancing regional investment with local access to regional networks avoids bypassing communities that could otherwise benefit from potential improvements in connectivity. It is necessary to consider potential opportunities for local communities when investing in infrastructure, given that the inequalities both within and between countries of the study region have significant impacts on trade and economic growth. A regional focus on connectivity emphasises higher-speed and higher-capacity infrastructure to cover long distances. This can often come at the cost of investment in local transport networks, which facilitate movement for local production and consumption. The quality gap for secondary road networks increases costs for local producers and can be a barrier to participating in trade, in turn contributing to higher costs and higher inequality.

Policies to encourage multimodality can increase transport system resilience considerably. During the Covid-19 pandemic, for example, to reduce contact with local communities the Northern corridor made all transit shipments from the port of Mombasa use rail to the Naivasha inland container depot for further clearance. This measure had many benefits, including sustainability benefits, given that the stretch of the Northern Corridor from Mombasa to Nairobi is amongst the most polluted and congested stretches of the route. However, this approach faced various challenges, including staffing constraints, empty runs and resistance from operators due to perceived added costs.

With more ambitious policies and investments, including investments in rail and addressing barriers to using the mode, rail mode share could increase significantly, reducing the study region's reliance on road transport. Currently, however, many sections of the existing rail network require rehabilitation (particularly the old metre gauge railway), and speeds in various sections are restricted due to infrastructure conditions (CCTTFA, 2023). Addressing these issues on a section-by-section basis may not yield significant improvements across the network and can take a long time.

Bundling projects, either along regional corridors, or for specific links can be an effective way of mobilising funding. For example, the first and second Tanzania Intermodal Railway Projects (TIRP), funded by the World Bank, combine track and bridge rehabilitation and preventative maintenance for flood protection with intermodal terminal improvements and operational and institutional support for safety improvements and asset management to address various interconnected challenges that individually, may not yield as significant benefits.

Rail infrastructure increases access opportunities, but is also vulnerable to risks, and the costs of damages could be significant. System-wide information and assessments of future risks should be considered when investing in the mode to create alternative routing options for freight. For example, rail's cost competitiveness in accessing ports can also lead to over-reliance on specific rail links and specific ports (see Box 6).

Box 6. Investing in port resilience

Freight activity in Sub-Saharan Africa is projected to significantly increase over the next two decades (ITF, forthcoming). A 2019 World Bank study estimated that container demand in the East and Southern Africa ports would exceed capacity by 2025. These factors necessitate significant investment in port capacity on the continent, along with hinterland connectivity to improve efficiency and reduce trade costs.

Port hinterlands are typically defined as the inland economic areas that generate cargo flows to and from ports. Ports typically compete for the hinterland markets, and literature indicates that port choice is mainly determined by transport costs and time to access the port and port capacity, cost and efficiency. In East Africa, the quality of port service is also a significant factor.

While most port investments to increase competitiveness typically focus on improving economic efficiency (e.g. increasing capacity, reducing travel times, improving connectivity), resilience, especially as it relates to redundancy, has been less of a focus. Investments to improve efficiency and connectivity to ports can have both synergies and trade-offs with redundancy. Given the growing instances of disruptions to ports, understanding system-wide impacts of disruptions and evaluating potential trade-offs when making investments is increasingly important.

In East Africa, a limited number of ports serve a large hinterland, and the relatively sparse transport network means that there are limited redundancies for these hinterland areas. Currently, much of the inland area in the study region is dependent on a single port, and typically on a major regional corridor. The types of investments made in port improvements in such contexts can influence the redundancy and resilience of the port-hinterland transport connections.

While new ports (greenfield specifically) will always increase redundancy by providing alternative choices in the event of disruptions, the costs of building new ports can be prohibitive, and the time scales for development long. In addition, the infrastructure needed to connect to the port can also be costly and often delayed, as has been the case with the new Lamu port and Lamu Port – South Sudan – Ethiopia Transport (LAPSSET) corridor. Nonetheless, the Lamu port can specifically benefit the hinterlands currently served by the Mombasa port, and with improved access to the port, these benefits can be far-reaching.

Expanding the capacity of existing ports can have mixed results. for example, dependency on a specific port may increase for the core area of the hinterland. Meanwhile, the redundancy for peripheral areas within the catchment of multiple ports can increase due to those same improvements, provided that the peripheral areasy have adequate access. Similarly, investing in rail access to ports can reinforce dependency on a single port because of the cost-competitiveness of the mode. However, for long-distance goods movement, a new rail link that reduces travel time or costs can make otherwise more distant ports more viable. The impact of improved rail connections will depend on the coverage and connection to ports, and the condition of the rail network, but on average can improve access.

Landlocked countries can particularly benefit from port and rail investments, reducing their transport costs and travel times. However, system-wide evaluation of these trade-offs in redundancy and accessibility is necessary for appropriate prioritisation of transport investments to maximise benefits.

Source: Verschuur and Tavasszy (forthcoming).

Adaptation strategies for freight disruptions

Adaptation measures are necessary following disruptions, to improve recovery time and reduce future transport costs related to damages from climate risks. Regional authorities have identified the need to identify and communicate disruptions to critical infrastructure (e.g. early warning systems), including emergency response mechanisms. Some member countries of the EAC already have national platforms and strategies for disaster risk reduction, but institutional capacities and cross-border co-ordination are still an obstacle and can delay the implementation of adaptation measures (EAC, 2012). However, the mainstreaming of such policies at national levels and the prioritisation of resilience in investments and project selection and appraisal is not yet commonplace.

The development of early warning and response systems faces funding barriers and challenges related to data sharing between institutions. Regional institutions, such as the East African Community (EAC) and the corridor management institutions already play a role in collecting and sharing data related to transport system performance and operational information. Regional institutions with the capacity, especially for cross-border co-ordination, can play a larger role where there are national and subnational gaps in data collection and timely dissemination of information.

A regional approach to emergency preparedness and response is relevant for freight because it can be a platform for co-operation between countries that may opt for different approaches to managing disruptions. Potential benefits from a co-ordinated response following a disruption are discussed further in Box 7.

Box 7. Co-ordinated responses to freight disruption: Lessons from the Covid-19 pandemic

The Covid-19 pandemic had significant effects on transport and logistics globally, with direct impacts on transport workers in terms of infection rates and related health effects. Policies to reduce and regulate transport movements to contain potentially lethal infections affected global supply chains and the recovery from this global disruption in terms of operations is ongoing (ITF, 2024). In the East African Community (EAC), one main effect was an increase in border crossing times and costs during the peak of the pandemic, although the increases were not uniform across the region, potentially reflecting the extent of containment measures. Some infections were attributed to congestion at bottleneck locations, such as border crossings and port entry points, illustrating the additional value of improving efficiency.

In addition to mandatory testing and restrictions to the number of staff on site, other measures to contain infections in the EAC included

- shifting to rail where possible
- changes to operations (relay driving at borders, designated stopovers)
- various digitalisation measures (online submission of cargo documents, non-intrusive cargo verification, implementation of cargo tracking systems).

Despite the challenges presented by the pandemic, some of the implemented measures had lasting positive effects on goods movement in the region and illustrated opportunities to address multiple objectives. Notably, the digitalisation measures, which saw increased automation for cargo clearance processes and greater efficiency due to cargo tracking systems, are becoming more common across the study region. This process, especially the increased use of cargo tracking systems, has also improved mechanisms for collecting and sharing data and information for regional institutions.

Source: Shippers Council of Eastern Africa (2021).

Policy recommendations

This section outlines the policy recommendations to improve freight connectivity, sustainability and resilience in the study region. It is based on the qualitative and quantitative analysis presented in the previous sections, combined with extensive feedback from regional stakeholders in the East Africa study region. The main priorities identified in the study region included:

- the implementation of agreements to further liberalise trade in the study region and facilitate intra-regional trade
- investment in infrastructure to improve regional integration, grow local production, support value addition, and foster inclusive economic growth
- wider adoption of digitalisation measures to improve efficiency, data sharing, and transparency.

There are various challenges related to the movement of goods in the study region caused by the trade imbalance, and exacerbated by the varying development trajectories of the study countries, which can delay the implementation of trade harmonisation policies and infrastructure development. There are structural and policy barriers, and infrastructure challenges that are inhibiting connectivity in the region, and many of these are interconnected.

The key challenges identified through the review and stakeholder consultation, as discussed in the previous sections, include:

- institutional barriers to harmonisation (including capacity, complexity of the institutional environment, financial constraints)
- high transport and trade costs (due to various factors including geography and infrastructure constraints, structure of logistics services, and structural inefficiencies)
- infrastructure gaps (in availability, quality, and maintenance across modes) affecting travel times)
- challenges mobilising funding for infrastructure development.

The analysis, and these priorities and challenges, inform the four main policy recommendations for improving regional freight connectivity for East Africa.

Combine transport infrastructure investments with trade facilitation measures

Once projects are completed, issues related to the uneven levels of development in the region, as well as institutional barriers in implementing harmonisation measures can impact the effectiveness of infrastructure investments. Additionally, improvements in certain areas can result in higher traffic volumes in those locations, creating bottlenecks.

For example, delays at border crossings are the result of a combination of issues, from road infrastructure constraints (e.g. limited lane capacity due to growing traffic volumes) to traffic management issues and complex customs clearance procedures. While addressing the physical infrastructure constraints has been essential at these locations, the adoption of automated cargo clearance procedures and cargo tracking systems has resulted in even greater efficiencies at borders. As the region moves towards greater trade liberalisation, targeting both hard infrastructure improvements at bottleneck locations and soft measures will ensure that freight efficiency is maintained even as trade volumes grow. This is demonstrated in the reduction of average time to reach global GDP in the HA-C scenario by 2050. Addressing issues related to the harmonisation of policies and trade facilitation can reduce uneven implementation between countries, ensuring more effective outcomes from investments.

Boost resilience by balancing corridor infrastructure investments with local community development

The gap in quality for secondary road networks increases costs for local producers and can be a barrier to participating in trade, worsening inequality. Balancing investment in regional infrastructure, which focuses primarily on speed and capacity, with improvements in secondary roads and local access to regional networks avoids bypassing communities that could otherwise benefit from potential improvements in connectivity. This is illustrated by the larger role secondary roads play in the HA-C scenario. Improvements in these contexts can have multiplier effects for economic inclusion, including rural development and poverty alleviation. This approach can alleviate disparities in development and provide local redundancies for the regional corridors in the event of disruptions.

Better connectivity and access for local networks improves market access for small-scale traders,but requires consolidation and investment in facilities such as warehouses and cold storage facilities. Private logistics providers can focus on this to better co-ordinate their services.

Finally, small-scale traders face barriers in accessing markets, even under simplified trade regimes. They face barriers related to access to information and costs to comply with institutional frameworks and technical regulations. They are also constrained in terms of physical access to markets, based on the availability and quality of local networks. Ensuring that major investments make considerations for small-scale and informal cross-border traders can reduce these barriers so that benefits from regional improvements are more inclusive. This can include actions such as business training and professionalisation, investing in and scaling-up initiatives such as Safe Trade Zone markets, and addressing enforcement issues.

Take a regional approach to addressing challenges in data and information sharing

Limited data sharing along major corridors, and different levels of application of regional regulations between countries contributes to delays. For example, the implementation of electronic single processing windows at border crossings, cargo tracking systems, and automated processes for completing customs procedures allow for the pre-clearance of documentation across much of the study region and can reduce delays at specific bottleneck locations. However, the interoperability of digital systems, and the sharing of data across institutions create a barrier to the implementation of pre-clearance procedures.

These challenges require significant co-ordination and data and information sharing across borders and institutions to address. Despite the existing regional institutional framework to support policy harmonisation for trade, the implementation of regional policies remains inconsistent in the study region due to various challenges. These include the overlapping mandates of institutions, as well as varying stages of development among the countries, which can contribute to delays. Rather than developing new tools and processes, regional institutions should prioritise sharing data and information through existing channels, better integration of digital systems to ensure interoperability, and focus on a wider adoption of the successful systems already operating in the region to address these challenges.

Bundle smaller interventions along regional corridors to mobilise funding

Interventions do not have to focus on major infrastructure investments that have long timescales and can be complex. Implementing safety and efficiency measures like signalling systems and rehabilitation measures can improve connectivity by reducing the frequency of disruptions and, as a result, travel time. While the region has major infrastructure projects in the pipeline for development, often smaller interventions that can have significant impact on operations lack the attention of funders. In part, this is because some funding sources have minimum thresholds, and the administrative burden of applying for funding for many small projects can be high. Bundling projects across the region that are similar in scope and that can share resources and allow standardised project delivery can help make such projects bankable, as well as decrease the time it takes to deliver projects.

For example, the metre gauge railway (MGR) network, while still largely operational in the region, has significant maintenance gaps that reduce its operating capacity. In Tanzania, the country's rail corporation is working on addressing this issue, rehabilitating tracks to work towards removing speed restrictions. However, once addressed they will still need to acquire more wagons to operate at capacity. Co-ordinating procurement with other regional authorities in similar positions can be an opportunity to reduce costs and share best practice. This approach can also help to address some of the challenges related to mobilising funding, as it allows for the bundling of small projects to reduce administrative costs, share resources and standardise project delivery.

Reduce freight emissions through regional technical co-operation

Achieving the emissions reduction in the high ambition scenario will require a significant shift from road transport to rail in the study region. Challenges such as infrastructure availability, modal integration, and operating practices may be a barrier to achieving this mode shift. However, the countries in the study region also share common priorities for sustainability, creating an opportunity to deepen regional collaboration by sharing experiences, information, and best practices. Additionally, some countries in the study region have successfully implemented policies that can be applied to other countries in the region. In particular, "quick win" strategies, such as driver and operator training, operations optimisation to reduce kilometres travelled, and support for asset sharing can be applied in collaboration with corridor management authorities, co-operatives and traders' associations.

Regional authorities can focus on setting minimum standards for addressing common challenges such as sustainability and resilience. This can facilitate technical co-operation that will help countries in earlier stages to reduce their freight development gaps. Standards can be similar to other established EAC regulations, such as the Vehicle Load Control Act, and focus on issues such as emissions data collection, information sharing, fuel efficiency, and hazard mapping. Taking a regional approach can also reduce costs and streamline efforts to avoid duplication. There are also opportunities for individual countries within the East Africa study region to increase ambition and strengthen linkages between sustainability measures and the nationally determined contributions (NDCs), by committing to short-term, measurable, and scalable actions.

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East Africa Freight Transport:
Enhancing Regional Connectivity

Connecting goods and materials with people and markets is an essential driver of economic growth and prosperity. This project explores freight connectivity and infrastructure capacity up to 2050 in one of Africa's fastest-growing regions: East Africa. The project highlights potential connectivity issues by evaluating the major regional projects underway and offers recommendations for hard and soft measures to improve freight connectivity.

Home to over 400 million people, the East Africa region relies on strategic transport corridors for goods movement and regional integration. Since most of the countries in the project scope are landlocked, regional co-operation and trade harmonisation policies play a significant role in reducing the high cost of transport and improving competitiveness.

This study adapts the ITF's regional freight connectivity framework – already successfully used in Central and Southeast Asia – and applies it to the East African context for the first time.

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