



Tracks to Prosperity: Realising the vision for the South Africa-Botswana Rail Corridor

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Preface

Africa is the world's top producer of critical minerals and platinum group metals, gold, diamonds, and vanadium. It also holds the world's largest reserves of manganese, cobalt, and phosphate, among others.

Its potential is even greater. Unfortunately, much of this potential is considered “stranded” because of a lack of investment in transport corridors. At Anura Partners, we believe that rail is one of the key enablers to support the unlocking of this potential.

We have observed the renewed interest and ongoing focus on a new railway line between Botswana and South Africa, which would be enabled by a new rail link between Mmamabula in Botswana and Lephalale in South Africa.

It would connect to the existing rail networks of Botswana and South Africa and become an artery for Botswana's minerals to flow to regional and international export markets. We believe this corridor is one of the most viable on the continent, as it has active mines as future users and requires only a short greenfield link with brownfield upgrades.

We fully appreciate that the development, construction, and operation of a railway corridor are complex undertakings and that its success depends on meticulous initial collaboration and planning that aligns with the requirements of all stakeholders.

Therefore, we developed a unique and comprehensive understanding of how and why this Botswana-South Africa Rail Corridor project could be instrumental in the economic growth and social development of both countries and the region.

This report draws on best practices from successful and failed corridor developments across the continent, provides an overview of critical options and their implications, and presents the strategic options for its planning and implementation. It aims to share insights and foster collaboration with those connected to the corridor and others involved in similar infrastructure projects to maximise the corridor's potential for various industries, the regional economies and the people of Botswana and South Africa.



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Methodology

The purpose of this research project is to provide a fact base to inform the thinking and approach for the Botswana-South Africa Rail Corridor.

We conducted a series of expert interviews, drawing on established knowledge, and existing frameworks to consolidate these elements into a concise, actionable approach for all stakeholders operating within this ecosystem. By integrating expert opinions, lessons from comparable rail projects, and context-specific challenges, the report offers a cohesive vision that has not been collated in this form before. We analysed and drew insights from other successful African rail corridors to inform the corridor's design and implementation. This approach ensures the report informs and equips stakeholders with the tools to collaboratively address the complex dynamics of the Botswana-South Africa Rail Corridor, to transform it into a catalyst for regional growth and integration.

The objective was to assess the viability, the investment requirements, a high-level business case, and the most suitable operating model of the Botswana-South Africa Rail Corridor. We built a proprietary model that enabled the aggregation of all input factors to calculate the cost for the total project. Key areas covered include the estimated USD 2.7 billion required for infrastructure upgrades and rolling stock, the feasibility of various operational models, such as public-private partnerships (PPPs), and the environmental and social implications of the corridor. These outputs depend on multiple variables. Firstly, the demand for freight volumes based on production forecasts.

Secondly, a projection of the mineral mix and volume allocation on the corridor. Thirdly, the capacity of the corridor, depending on the railway line infrastructure, the rolling stock, and the port infrastructure, informing the required investments.

To estimate the demand for export volumes based on production forecasts, we used the target volume of 24 mtpa for the corridor as cited in the Request for Information (RFI)/Expression of Interest (EOI)¹ by Transnet and Botswana Railways. These align with coal production forecasts as the anchor mineral in Botswana and the Waterberg, which will become a more diversified mix over the investment period.

The respective capacity and investment requirements to achieve this target volume can best be understood by assessing the corridor in four parts:

1. Upgrade rail lines to mines in Botswana
2. Construct the Mmamabula to Lephalale rail link
3. Upgrade rail lines in South Africa
 - a. Upgrade the North Corridor
4. Upgrade port facilities to handle the volume, depending on the terminals used for the corridor

To project the mineral mix and volume allocation on the corridor, we used the following assumptions:

- **Coal production in Mpumalanga:** Thungela Resources published a report² that included coal production projections based on a study completed by Wood Mackenzie for the Mpumalanga coal region. These projections were split into multiple phases, which were used as a basis for the timelines in this report. Using these assumptions and factoring in the decline in logistics performance, which has extended the coal supply and life of mines in the Mpumalanga region, we extended the timeline by 10 years compared to the report.
- **Coal production in the Waterberg:** We used the annual reports of Exxaro, operating Grootegeluk, the biggest coal mine in the Waterberg, to understand the additional volumes being added onto the network and forecast the volume uptake in the Waterberg.

¹ *Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023*

² *Thungela Resources: "A Leading Export Thermal Coal Business", 6 May 2021*

To estimate the infrastructure capacity and the investments required along the corridor, we compiled insights from expert interviews and other publicly sourced information:

- The Link between Botswana and South Africa, as laid out in the RFI/EOI,³ will allow for 24 mtpa at a cost of ZAR 4 billion (USD ~230 million).
- For the railway in Botswana, we assumed ~1 mtpa capacity based on a range of five to eight 50-wagon trains per week, with the option to expand the network to 10 mtpa, at a cost of USD ~90 million, as cited by an expert.

- For the South African railway from Lephalale to Ogies, we estimated the average investment amount of upgrades of the railway line per kilometre at ZAR ~21 million/km. We applied this to the ~650 km, resulting in USD ~830 million for the proposed 24 mtpa.
- According to an article in Bloomberg covering a Thelo report,⁴ USD 670 million is required over five years to restore the Ogies to RBCT to ~77 mtpa.

To estimate the rolling stock and operational requirements, we consolidated the insights from multiple expert interviews, based on an estimated cost for a locomotive of USD 4 million and a wagon of USD 100,000.

To assist in calculating the required rolling stock for any new infrastructure upgrades, a turnaround time of 75 hours was assumed for the North Corridor, based on the 87-hour turnaround time, as referenced by July Ndlovu, CEO of Thungela Resources in the 2023 Mining Yearbook, published by Miningmx. This was adjusted for the subsequent improvement in logistical performance on the North Corridor.

In addition, we factored in the exchange and inflation rate based on two sources from Investec to forecast the Dollar-Rand exchange rate⁵ and the inflation rate.⁶ The exchange rate forecast included 2024 to 2026 and assumed constant thereafter. The inflation forecast included 2024 to 2025 and assumed constant thereafter.

³ *Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023*

⁴ *Bloomberg: "South Africa Coal Export Line Will Need Five Years to Refurbish", 2024*

⁵ *Investec Rand Note, 9 September 2024*

⁶ *Investec Household-finances, 13 September 2024*



Key insights

1

A lifeline for Botswana and an opportunity for the Southern African Development Community (SADC)

The Botswana-South Africa Rail Corridor will extend from the mines via the Mmamabula-Lephalale link through the North Corridor to Richards Bay, with its multiple ports and terminals. It is the most viable corridor for Botswana and one of the most attractive on the continent. It will provide the most cost-effective route to export minerals out of Botswana and to import general freight into the country. It will unlock Botswana's mineral potential, support South Africa's bulk commodity export needs, and bolster regional trade connectivity, reaching Zambia and the Democratic Republic of Congo (DRC) along the North-South Corridor.

2

Economic impact beyond USD 40 billion

This corridor can potentially create over USD 2.4 billion in export value per year for freight alone. Over the modelled lifetime of this corridor, from 2025 to 2050, incorporating a ramp-up, the total gross opportunity is USD >40 billion. This excludes the added benefits that will be realised by attracting new value chains. Aligned with the objectives of the African Continental Free Trade Area (AfCFTA), the corridor will represent significant progress towards regional economic integration and social benefits through job creation.

3

Triple win for state-owned rail operators, freight owners, and governments

All stakeholders will win. Governments and the people of both countries will benefit from increased tax revenues, more jobs, safer roads, and strengthened trade relations. Logistical bottlenecks will no longer constrain mines and freight owners. Therefore, they will increase production and unlock new mining developments. Botswana Railways and Transnet will increase their revenue due to increased raiiling capacity and access fees for infrastructure usage.

4

Close collaboration between SOCs and freight owners is a prerequisite to enabling pragmatic implementation

Transnet and Botswana Railways, as infrastructure owners and operators, share their ultimate interests with freight owners. Both sides aspire to increase freight on rail as soon as possible. To achieve this shared goal, they need to collaborate more closely to accelerate the implementation process and overcome challenges that arise throughout. Examples of such collaboration, include but are not limited to, convening regular round table discussions, conducting a joint feasibility study, compiling project funding, and selecting study and implementation partners through joint RFPs.

5

South Africa's energy security is dependent on the corridor

Despite a notable increase in renewable contributions, Botswana and South Africa, as well as other emerging economies, are highly dependent on coal for their energy security. South Africa expects a shift in coal production volumes as Mpumalanga coal mines near their end-of-life. However, the coal fields in Botswana and the Waterberg at the beginning of the corridor have a life-of-mine of more than 30 years. With this shift, Eskom, the South African power utility, will eventually require coal from Botswana and the Waterberg to be transported to the power plants via rail to provide energy security to South Africa.

6

The corridor is underwritten by bulk commodities

Bulk commodities provide a strong business case for the corridor. Botswana imports and exports relevant volumes of copper, iron ore, manganese, soda ash, sand, petroleum, and agricultural and containerised freight. Ideally, corridor usage will be in both directions, opening the possibility of imports of petroleum and containers into Botswana. The Botswana-South Africa Rail Corridor can be expanded to Zambia and linked into the DRC through the Kazungula Bridge, which is designed to accommodate rail. Therefore, the corridor will potentially open another artery for minerals required for the energy transition.

7

An investment of USD ~2.7 billion is required to realise this corridor

The Botswana-South Africa Rail Corridor requires USD ~2.7 billion to facilitate the intended 24 mtpa. The total infrastructure investment required between 2025 and 2030 is USD ~990 million. This is divided between the Botswana rail infrastructure (USD ~90 million), constructing the link (USD ~230 million), and the North Corridor upgrades (USD ~670 million). There is subsequent infrastructure investment required between 2030 and 2035 of USD ~830 million on the South African North Corridor rail network. To facilitate the additional capacity of the rail infrastructure, USD ~860 million is required to acquire the necessary additional rolling stock between 2025 and 2030.

8

The private sector must play a leading role in attracting the funding

To unlock 24 mtpa on the corridor, significant investments in the greenfield link, brownfield upgrades and new or reconditioned rolling stock are required. Considering the financial constraints of both national rail operators, the funding will need to come from developmental and private funders. To substantiate a business case, funders must believe in the incremental volumes the investment will unlock. Open access allows multiple train operating companies on the corridor from pit to port, and infrastructure management (upgrades, maintenance, and operations) in collaboration with the public and private sectors will build confidence. Considering the history and current constraints of the state-owned rail companies, funders will require the private sector to lead a private sector participation rail solution to accelerate timelines.



Executive summary

Despite its resource wealth, Africa has yet to truly harness and benefit from its economic potential, due to a lack of investment in transport infrastructure – specifically on cross-border rail corridors, which are critical for mineral exports and localising value chains. Over the past decade, major African railway corridors have undergone significant upgrades, including the 2014 rehabilitation of the Lobito Corridor, the 2016 expansion of the Nacala Corridor, the 2011–2018 construction of the Addis Ababa-Djibouti line, and the early 2010s improvements to TAZARA, Ressano Garcia, and North-South rail lines.

This report examines the Botswana-South Africa Rail Corridor underpinned by the Mmamabula-Lephalale link, a pivotal infrastructure project that, when realised, will promote regional trade, enhance connectivity, and be pivotal to unlocking Botswana's mineral wealth while supporting South Africa's bulk commodity export capabilities

With the implementation of the AfCFTA,⁷ efficient and well-operated rail corridors to evacuate minerals to ports have become increasingly relevant. Across the continent, dozens of cross-border railway projects are in various stages of development. Some are under realistic planning, while others remain aspirational. These projects connect inland mineral-rich regions to international markets, driving economic growth by increasing mineral exports and unlocking new mining activities. As global demand for critical minerals rises, Africa's strategic position becomes more apparent.

The Botswana-South Africa Rail Corridor is one of the continent's most viable and efficient routes. From Botswana's Mmamabula bulk commodity fields to South Africa's rail network at Lephalale, the corridor aims to transport 24 million tonnes of freight annually, underwritten by bulk commodity. It also serves as the most efficient export line considering the length of the corridor, required greenfield developments, and the option to connect to an existing heavy-haul line and port infrastructure route for a range of minerals, thereby supporting regional competitiveness. This initiative is essential for meeting South Africa's growing energy needs as Mpumalanga's coal reserves decline, while facilitating freight and petroleum imports and diversified mineral exports.

The corridor offers significant benefits to multiple stakeholders:

1. Governments will unlock economic growth, benefit from increased tax revenues, reduced road usage and thus maintenance costs, and strengthened trade relations.
2. Communities along the corridor will benefit from job creation during construction, railway operations, and expanded mining activities. Entrepreneurs will gain access to new opportunities driven by increased economic activity. The corridor promises higher freight volumes and increased revenues for national rail operators such as Transnet and Botswana Railways, which can be reinvested into much-needed modernisation efforts.
3. Reduced logistical bottlenecks will benefit freight owners and mining companies, enabling the expansion of existing operations and the development of new projects. This is particularly critical in South Africa, where challenges and infrastructure limitations on the railway network currently restrict mining output and exports. The corridor will also stabilise and grow South Africa's Waterberg bulk commodities exports, while supporting broader industrial and mining activities in Botswana and facilitating increased imports.

⁷ *Operational Phase of The African Continental Free Trade Area Launched, African Union, 18 October 2024*

⁸ *Botswana Rail Link EOI Briefing Presentation, Transnet and Botswana Rail, 21 July 2023*

For example, between 2019 and Q3 2022, Nacala Logistics raised USD 540 million in taxes and concession fees, illustrating the transformative impact such projects can have on public finances.

To realise the corridor's potential, several infrastructure challenges must first be addressed. An estimated USD 2.7 billion investment is needed to construct new rail links, upgrade existing infrastructure, and procure ~90 locomotives and 3,000 wagons. Infrastructure degradation caused by theft, vandalism, and ageing systems must be tackled to ensure operational efficiency. The port infrastructure needs to accommodate the export volumes, and the Multi-Purpose Terminal and the Dry Bulk Terminal at Richards Bay will need strategic upgrades to increase freight volumes. In addition, the North Corridor needs to be restored to its historical capacity of 77 million tonnes per annum, which will require USD 670 million over five years.⁹

Case studies from other African rail corridors offer valuable lessons. The Nacala Corridor demonstrated the importance of securing anchor freight volumes while diversifying cargo to include bulk commodities. The Lobito Corridor showcased how private concessions can modernise infrastructure and increase operational efficiency. The TAZARA Corridor emphasised the benefits of open-access frameworks, promoting competition and boosting freight volumes. These examples provide inspiration for implementing the Botswana-South Africa Rail Corridor. Based on these case studies, we identified the minimum requirements and success factors for a corridor project.

The five minimum requirements are:

- 1) The corridor must be the most efficient route, with a length that can compete with road logistics and realistic construction costs.
- 2) The business case must align with the freight profile and be based on an anchor mineral that provides sufficient volumes to secure a return on investments.

- 3) Sufficient funding must be secured from multiple sources to cover the railway line, port, and rolling stock requirements as part of one project.
- 4) A cross-border corridor agreement must be signed between the respective governments for any corridor across multiple countries.
- 5) Sufficient rolling stock and train operating capacity must be secured through existing state-owned entities and new privately funded ones.

The five supporting success factors for a railway corridor are:

- 1) The location of mineral production needs to allow for an efficient transportation process, which considers density, similarity of the mineral, and the place of loading and discharge. If not, the consolidation or reloading of freight will cause delays.
- 2) Coordinating the process to plan and develop the corridor is essential and should ideally be facilitated by a private sector entity with the necessary expertise and experience.
- 3) The corridor will require the support of multiple funders, which will require an investment case that projects a positive return on investment to attract investors with a purely financial interest.
- 4) The sustainability of the corridor requires a sustainable mix of minerals and opportunities for both exports and imports.
- 5) In addition to exports, opportunities for imports are essential to increase the utilisation of the corridor.

In addition, the operating model is essential, and the evaluated case studies highlight three possible operating models for the Botswana-South Africa Rail Corridor.

Successful corridors comprising railway infrastructure, train operations, and ports are either solely public projects, private concessions, or PPPs in the form of open access or a consortium or similar structure with a concession.

Considering the required investments into infrastructure, rolling stock, Transnet's USD 9 billion debt, and limited reinvestment capacity, the corridor cannot succeed as a solely public project. A private concession is unlikely as the governments of both countries are actively involved in developing the corridor. Consequently, a PPP can unlock the full potential of the corridor. In addition, lessons from TAZARA and other corridors highlight the value of involving private operators to bridge capacity gaps while maintaining effective public oversight. South Africa's National Rail Policy (2022)¹⁰ and Network Statement¹¹ (2024) further support the transition to open access, encouraging PSP and addressing funding and operational challenges.

⁹ Fikile Mbalula, former South African Minister of Transport, on the launch of the White Paper on National Rail Policy, South African Government, 9 May 2022

¹⁰ White Paper on the National Rail Policy March 2022, South African Government, 12 May 2022

¹¹ Network Statement, Transnet Rail Infrastructure Manager, 19 December 2024

Two options involve the private sector in the corridor's development:

1. One option is a specifically established public-private entity taking on the concession, as demonstrated by the Lobito Corridor and the Nacala Corridor. Such an entity can mobilise the necessary funds for infrastructure and rolling stock while maintaining operational efficiency and accountability by building on existing structures.
2. Another option is an open-access solution, such as those involving private operators like Calabash Freight in TAZARA with a public infrastructure manager, which provides an opportunity to bridge capacity gaps and ensures operational continuity.

Stakeholder engagement will play a pivotal role in the corridor's success. Early collaboration with freight owners, including mining companies, will secure investments and long-term commitments. Lessons from the Lobito and Nacala corridors demonstrate how private stakeholders can underwrite projects while ensuring capacity utilisation.

Momentum for the project has grown since June 2023, when Botswana Railways and Transnet issued an RFI/EOI¹² for the Mmamabula-Lephalale link.

The Botswana-South Africa Rail Corridor's economic and social impact hinges on two critical factors: the successful implementation of railway infrastructure and the maximisation of transported volumes.

The indirect employment creation for railway projects is estimated to be more than double the number of jobs required for construction. For instance, the Nacala Corridor created over 10,000 jobs (both direct and indirect).¹³ Similar outcomes can be expected along the Botswana-South Africa Rail Corridor, which has the potential to generate long-term economic benefits for communities and governments.

This project is not just about infrastructure development. It is the starting point to secure Southern Africa's position in global supply chains. By enabling efficient freight movement, the Botswana-South Africa Rail Corridor will promote regional trade and integration under AfCFTA.

It will connect inland mining regions to international markets and foster sustainable development by reducing environmental impacts by shifting from road to rail. With immediate and coordinated action, this historic project can deliver lasting prosperity for Botswana, South Africa, and the broader Southern African region.

¹² *Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023*

¹³ *An evaluation of employment creation and skills transfer during the delivery of capital projects in Sub-Saharan Africa: a focus on three selected case studies, University of the Witwatersrand, March 2017*



A unique opportunity:

The Botswana-South Africa Rail Corridor is an exciting opportunity for train operators, freight owners, users, communities, and their governments

African countries are becoming progressively more interconnected. The signed AfCFTA agreement¹⁴ highlights the increasing relevance of rail corridors to evacuate minerals to ports. As such, dozens of cross-border railway corridor projects are underway in Africa, connecting points deep inland with ports, which helps to increase the export of minerals and unlock new mining activities. This is particularly relevant as critical minerals in Africa are gaining attention. The corridors are in various stages of implementation – some are realistic and in planning, while others remain aspirational.

The Botswana-South Africa Rail Corridor (as an extension of the link between Mmamabula and Lephalale) is the most efficient export route to port from Botswana and one of the most viable corridors on the continent. It is also essential to meet the demand for coal in South Africa, especially for power creation when domestic coal supplies deplete in Mpumalanga.

The Botswana-South Africa Rail Corridor offers a promising opportunity for stakeholders, the economy, and society. It is an opportunity for governments to unlock growth through key railway routes, enabling exports of diverse minerals and unlocking Botswana's mineral wealth. The corridor will stabilise and grow South Africa's Waterberg exports and facilitate imports of freight and petroleum. Communities along the corridor will gain from job creation in the mines, railways and entrepreneurial opportunities. National rail operators (Transnet and Botswana Railways) can boost rail-transported volumes, and increase their revenues.

Established and prospective mines can expand production or develop new projects. This is particularly important in South Africa as the challenges and infrastructure requirements on the North Corridor currently restricts bulk commodity mines.

The corridor's economic and social impact hinges on two factors: the successful implementation of the railway operating model and the volumes transported. This indicates a focus on efficient corridor implementation and maximising transported volumes, as addressed in this report.

The governments of both countries stand to benefit in several ways, including increased tax revenues from freight owners as export and production volumes rise.

For instance, between 2019 and Q3 2022, Nacala Logistics raised USD 540 million in taxes and concession fees for the governments.¹⁵

¹⁴ Operational Phase of The African Continental Free Trade Area Launched, African Union, 18 October 2024

¹⁵ Nacala Logistics: Laying the Tracks of the Cargo Corridor, Supply Chain Outlook, 17 January 2024

The governments of South Africa and Botswana stand to benefit similarly from direct revenues generated by Transnet and Botswana Railways respectively, either as infrastructure managers or from access fees, reduced road maintenance costs as freight moves to rail, improving environmental impacts. Employment creation will boost tax revenues and reduce social support spending. New jobs will emerge during construction, railway operations, and increased mineral production. The indirect employment creation for railway projects is estimated to be more than double the number of jobs required for construction.¹⁶

Projects like the Nacala Corridor, which created 3,700 direct jobs during construction, are expected to generate an additional 7,400 as a second-order effect.¹⁷

¹⁶ An evaluation of employment creation and skills transfer during the delivery of capital projects in Sub-Saharan Africa: a focus on three selected case studies, University of the Witwatersrand, March 2017

¹⁷ Ibid



Supportive ecosystem:

Changes in the political and economic environment have increased the likelihood that the corridor will become a success

Stakeholders have discussed a railway corridor between Botswana and South Africa for over a decade without clear progress. In March 2022, the South African government approved the National Rail Policy, introducing open access on the national railway.¹⁸ However, Botswana has not passed any supporting legislation for rail reform yet.

The publication of an EOI by Botswana Railways and Transnet in July 2023¹⁹ for the development and funding of the Mmamabula-Lephalale link was an important milestone in developing the corridor, indicating the willingness of the two national operators to collaborate on this project.

Four elements were specified in the EOI, which aims to reach an export capacity of 24 million tonnes per annum (mtpa):

1. Upgrade rail lines from mines in Botswana
2. Construct the Mmamabula to Lephalale link

3. Upgrade rail lines in South Africa
4. Upgrade port facilities to handle the volume

An overview of this corridor can be seen in the following graphic. The Botswana-South Africa Rail Corridor connects southern Botswana, Limpopo, Gauteng, Mpumalanga, and KwaZulu-Natal to ports in Richards Bay.

In March 2024, Transnet published the much-anticipated Draft Network Statement, outlining a vision for competition on the railway lines and a vertical separation of Transnet, specifying

the conditions for private companies to access and operate on rail infrastructure. The Network Statement, published by the Transnet Rail Infrastructure Manager on 19 December 2024, will likely inform the Request for Proposal outlining how Botswana Railways and Transnet envision the corridor being developed. This will provide key stakeholders within the ecosystem with a clearer view of the steps needed to make the railway corridor a reality.

¹⁸ Fikile Mbalula, Former South African Minister of Transport, on the launch of the White Paper on National Rail Policy, South African Government, 9 May 2022

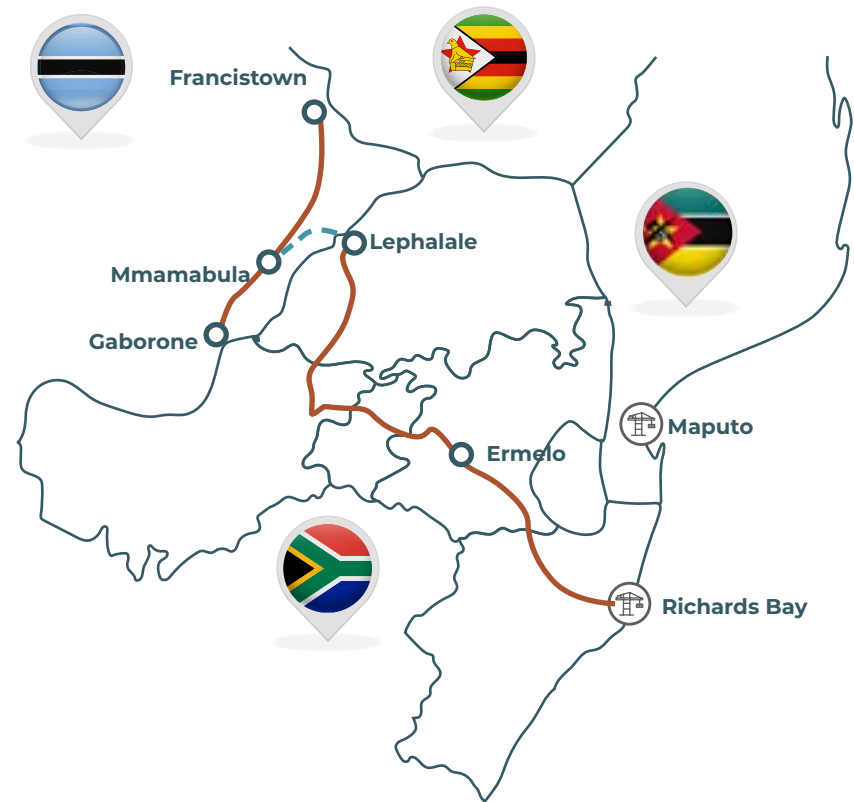
¹⁹ Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023

Four components of the Botswana-South Africa Rail Corridor

A rail corridor unlocks rail and port access for regional miners and exporters²⁰

- 1 Upgrade rail lines to mines in Botswana
- 2 Construct the Mmamabula to Lephthalale rail link
- 3 Upgrade rail lines in South Africa
 - 3a Upgrade the North Corridor rail line in South Africa (Lephthalale to Ermelo)
 - 3b Upgrade the North Corridor rail line in South Africa (Ermelo to Richards Bay)
- 4 Upgrade port facilities to handle the volume, depending on the terminals used for the corridor

Investment into rail would unlock ~24 mtpa in the Waterberg



Key

- Existing rail infrastructure
- - - New rail infrastructure
- Additional port capacity to be unlocked

²⁰ Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023

Volume increase of 24 mtpa:

The corridor can unlock an export volume of 24 mtpa with sufficient infrastructure upgrades and rolling stock investments

The link and the entire Botswana-South Africa Rail Corridor will be designed to transport a volume of 24 mtpa²¹ from Botswana and the Waterberg region for use in South Africa and for export to overseas markets. The planned corridor consists of the new link and multiple existing railway sections that will all require upgrades, costing USD ~2.3 billion, as current volumes are falling short of the design capacity and their full potential. The Botswana rail network would require USD ~90 million in upgrades, with the link itself costing USD ~230 million. For the South African rail network, USD ~670 million is required to restore the North Corridor to its previous volume levels and USD ~830 million to upgrade the North Corridor to facilitate the additional volumes from Botswana.

There are several reasons why existing railway sections will require upgrades. Firstly, the railway network in Botswana cannot facilitate the connection of the available volumes to the proposed Mmamabula link. There are two options to solve this: (i) upgrades along the ~250 km railway line costing USD ~90 million, or (ii) the development of a transshipment facility as part of the link that miners in the area will be able to use.

Secondly, the planned link between Lephalale and Mmamabula (in Botswana) is a greenfield development requiring USD ~230 million to connect the Botswana mines and the South African rail network with a potential throughput of up to 24 mtpa.²²

Thirdly, expanding further west via Lephalale (Limpopo) to Pyramid South (Gauteng) will require upgrades. However, to understand the extent of the necessary upgrades, further studies will need to be conducted to evaluate the current state of the infrastructure on the North Corridor. Several factors limit the potential for additional volumes to be railed on the corridor, including the infrastructure, theft, vandalism, and difficulties in funding the required upgrades. The North Corridor will also need to be upgraded to unlock a targeted export capacity of 24 mtpa, costing USD ~830 million. The need for locomotive changes between diesel and different electric models leads to delays in expected delivery times and reduces the line's performance. In addition, investment is required to overcome a shortage of rolling stock.

Lastly, the North Corridor, stretching from Richards Bay to the coal fields in Mpumalanga (Ermelo, Ogies, and branches), needs to be restored to 77 mtpa to facilitate the 24 mtpa²³ on the corridor. The North Corridor requires an investment of USD ~670 million over the next five years, as estimated in a report from Thelo Group, reported by Bloomberg.²⁴

Currently, the North Corridor will not be able to absorb additional export volumes due to the degrading infrastructure. According to the report referenced above, the North Corridor is expected to transport around 50 mtpa in 2024 – only 65% of the historic maximum at ~77 million tonnes in 2017.

²¹ Botswana Rail Link EOI Briefing Presentation, Transnet and Botswana Rail, 21 July 2023

²² Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023

²³ Anura Partners expert interview

²⁴ Bloomberg: "South Africa Coal Export Line Will Need Five Years to Refurbish" 2024

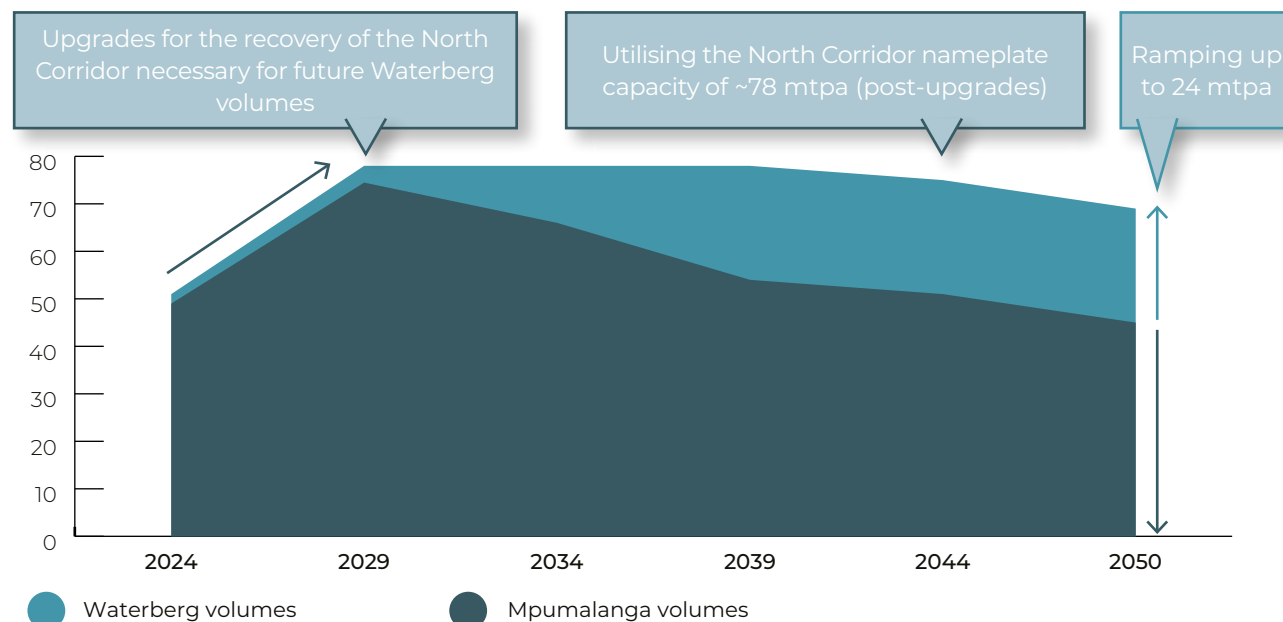
The decline can be attributed to the degrading infrastructure due to high rates of theft and vandalism and a lack of investments in maintenance, a lack of an efficient operating system requiring manual authorisation, and the shortage of rolling stock. If upgrades are not completed, the logistical constraints will slow down the forecasted production decline and mines in Mpumalanga can produce around 50 mtpa up to 2050,²⁵ prohibiting any additional volumes on the North Corridor Mines in Botswana and the Waterberg would need to wait for volumes from Mpumalanga to drop below ~30 mtpa before reaching the 24 mtpa target.

In 2024, only ~2 mtpa originated in the Waterberg²⁶ with ~49 mtpa bulk commodities from Mpumalanga. However, these proportions will change as mines in Mpumalanga reach their end-of-life. With upgrades on the North Corridor, Mpumalanga miners can return to previous export volumes until the end-of-life of these mines in approximately five to fifteen years. This decline can be supplemented with volumes from the Waterberg and Botswana being scaled up on the corridor to the targeted 24 mtpa by 2044 as the production there has a longer lifetime.

We conducted an analysis assuming that the North Corridor will be restored by 2030, informing a delay of export volumes from Mpumalanga by ten years, in line with the volume forecast reported by Thungela Resources that references a study by Wood Mackenzie²⁷ (refer to the graphic alongside). In this scenario, Mpumalanga bulk commodity volumes will peak at 75mtpa before 2030 and then decline steadily to 45 mtpa by 2050. If 24 mtpa are unlocked on the corridor, volumes from the Waterberg being transported on the corridor will have risen to 24 mtpa bulk commodity by 2050, making up a total of ~69 mtpa on the North Corridor.

Illustration of volumes being moved on the railway line up to 2050

Corridor volume split over time on the section referred to as the North Corridor in mtpa^{28,29}



²⁵ Anura Partners analysis

²⁶ Exxaro Annual Financial Results Presentation, Twelve-month ending 31 December 2023

²⁷ Thungela Resources: "A Leading Export Thermal Coal Business", 6 May 2021

²⁸ Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023; Expert interviews;

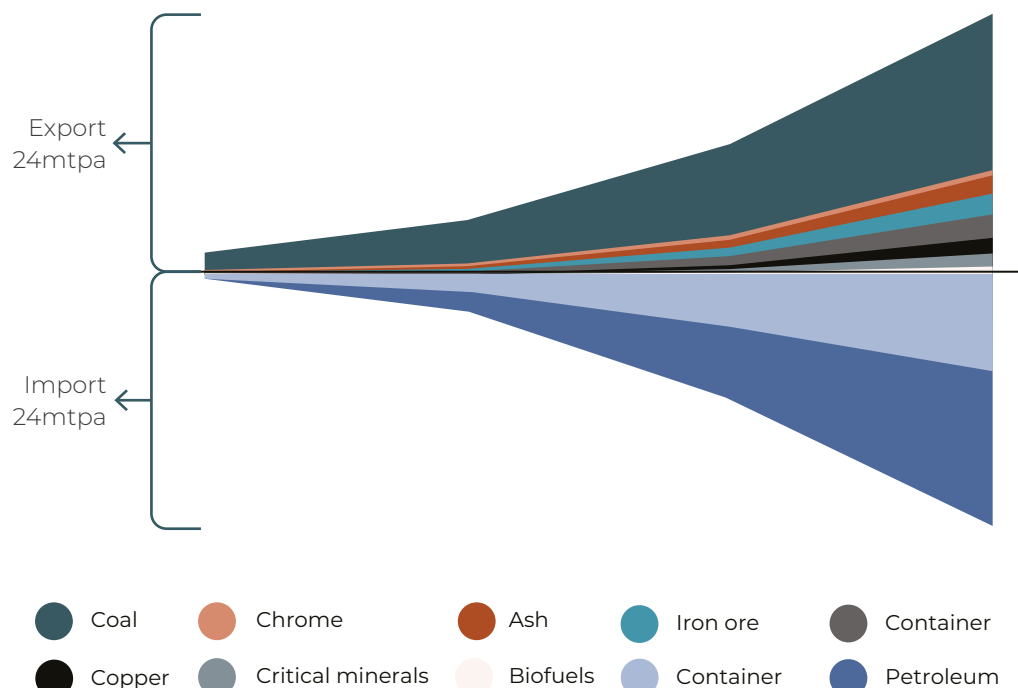
²⁹ Anura Partners analysis; Waterberg volumes include Exxaro and Botswana miners. In 2024, ~1.8 mtpa from Grootegeluk is based on Exxaro's financials, as it is currently the sole coal exporter in Waterberg. Volumes for 2030-2034 reflect rail upgrades as per the Bloomberg article (Bloomberg: "South Africa Coal Export Line Will Need Five Years to Refurbish" 2024), while post-2035 projections include Botswana miners

The Botswana-South Africa Rail Corridor is underwritten by a bulk commodity corridor. The graphic below illustrates the shift in commodity mix. The 24 mtpa not only applies to exports, but a significant share of the capacity can also be used to import freight. The imported goods will mostly entail containerised freight and petroleum products, which are predominantly trucked today. Commodities like chrome, soda ash and sand, iron ore, containerised freight, copper, critical minerals, and biofuels can be expected for export. The share of these critical minerals seems relatively small; however, the value per tonne for critical minerals is significantly higher than that of bulk commodities.³⁰

Even though the corridor in this initial planning state does not reach to the North of Botswana or Zambia via the Kazungula Bridge, where copper and other critical minerals are mined, the corridor can either be expanded to reach these commodities or these commodities can be trucked to the start of the Botswana-South Africa Rail Corridor, reducing road transport by more than 1,000 km.

Illustration of indicative shift to a multi-commodity corridor, ramp up until 2039

Corridor commodity split over time on the section from Botswana to the beginning of the North Corridor in mtpa³¹



³⁰ Thungela Resources: "A Leading Export Thermal Coal Business", 6 May 2021

³¹ Anura Partners analysis; Expert interviews



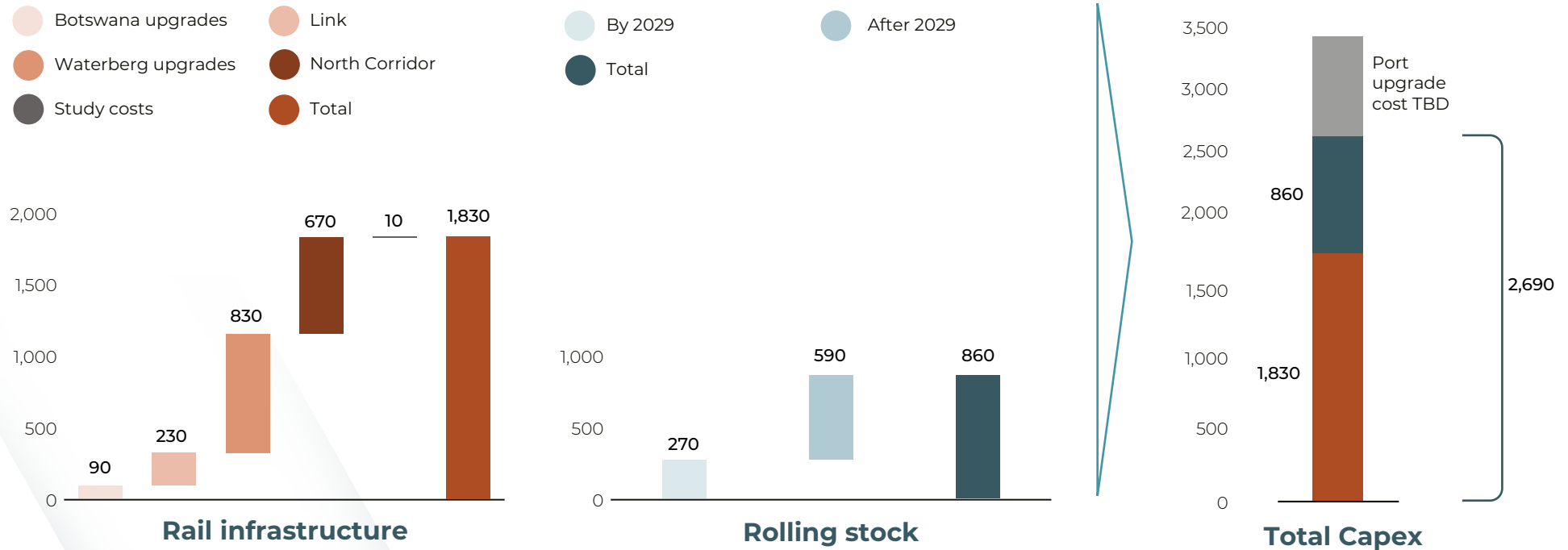
The Capex requirement for the corridor is USD 2.7 billion³²

Infrastructure investment requirements make up ~68% of this, including upgrades on the North Corridor, as shown in the graphic below. To upgrade the railway in Botswana, USD 90 million will be required to facilitate these volumes to either a transshipment facility or join the link. The link itself is expected to cost USD ~230 million in the Botswana Rail and Transnet Freight Rail RFI³³. North Corridor upgrades are forecasted to make up the biggest proportion of the total investment requirement at USD ~830 million. According to Bloomberg's coverage of the Thelo report, the North Corridor requires USD ~670 million.

In addition, the target volume of 24 mtpa from the Waterberg for the corridor will require ~90 locomotives and 3,000 wagons. Based on the assumption of train sets that comprise six locomotives and 200 wagons, an investment of USD 680 million will be required. Similarly, for 24 locomotives and 800 wagons, an investment of USD 180 million will be required initially to support the restoration to 77 mtpa on the North Corridor. This does not account for inflation, which needs to be factored in, as rolling stock will not be purchased all at once.

Changes required along the corridor^{34,35}

Total Capex requirements in USD million



³² Anura Partners analysis

³³ Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023

³⁴ Anura Partners analysis, online research and expert interviews

³⁵ Section 1 capacity assumes 5–8 trains (50 wagons each) weekly, while Section 4 is based on TFR's 2024 forecasts. Rolling stock requires six locomotives and 200 wagons per train. Coal Line upgrade completion dates are based on the Bloomberg article "South Africa Coal Export Line Will Need Five Years to Refurbish" 2024.

Capital costs by corridor component^{36,37}

Rail sections	Infrastructure volume capacity		Required infrastructure investment	Required rolling stock investments		
	Current	After upgrades		Additional locos	Additional wagons	Capex
1 Upgrade rail lines in Botswana	1 mtpa	10 mtpa (finish by 2029)	USD 90 million	By 2029: 12 After 2029: 78	By 2029: 400 Post 2029: 2,600	By 2029: USD 90 million After 2029: USD 590 million
2 Construct the Mmamabula to Lephale link	0 mtpa	24 mtpa (finish by 2029)	USD 230 million	Rolling stock considerations can be split into the Waterberg region and Mpumalanga		
3a Upgrade the North Corridor in South Africa (Lephale to Ermelo)	5 mtpa	24 mtpa (finish by 2041)	USD 830 million	Rolling stock purchases are phased from 2030 to 2050 to make up for increased turnaround times due to volumes shifting from Mpumalanga to the Waterberg		
3b Upgrade the North Corridor in South Africa (Ermelo to Richards Bay)	51 mtpa ~2 mtpa currently from the Waterberg region	77 mtpa (finish by 2029)	USD 670 million	By 2029: 24	By 2029: 800	By 2029: USD 180 million

³⁶ Anura Partners analysis and expert interviews

³⁷ Section 1 capacity assumes 5–8 trains (50 wagons each) weekly, while Section 4 is based on TFR's 2024 forecasts. Rolling stock requires six locomotives and 200 wagons per train. North Corridor upgrade completion dates are based on the Bloomberg article "South Africa Coal Export Line Will Need Five Years to Refurbish" 2024.



Case studies

Key lessons from successful corridors across Africa

The Botswana-South Africa Rail Corridor can draw important lessons from other successful and unsuccessful African railway projects. These case studies provide insights into the historical context, operational strategies, governance structures, and challenges that shaped the success or failure of similar corridors.

The successful case studies we cover include the Nacala Corridor, the Lobito Corridor, the TAZARA Corridor, the Maputo Corridor, the Addis Ababa-Djibouti Corridor, and the North-South Corridor. The cases were selected based on cross-border connections linking at least two African countries, with at least five years of operation to demonstrate viability, diverse operating models that highlight PSP, and geographical diversity to ensure broad regional representation across Africa.

In addition, we reviewed unsuccessful corridors to identify the main obstacles and challenges that prevented the realisation of similar projects. The unsuccessful case studies we reviewed include the Libya-Chad-Niger Corridor, the Cameroon-Chad Corridor and the Trans-Sahara Corridor. The cases were selected based on cross-border connections linking at least two African countries, at least five years of project delay, and geographical diversity to ensure broad regional representation across Africa.

The Nacala Corridor: Diversified freight and long-term concessions

The Nacala Corridor consists of a 912 km rail line from Moatize in Mozambique to the Port of Nacala,³⁸ passing through Malawi, transporting up to 22 mtpa with a maximum of 80% coal, the anchor mineral. Vale, the developer of the Moatize Coal Mine,³⁹ in partnership with Mitsui and Mozambique's national rail operator, Portos e Caminhos de Ferro de Moçambique (CFM), built and operated the line as a concession until its acquisition by Vulcan Resources.⁴⁰ Nacala Logistics now manages the rail infrastructure, train operations, and port, with Vulcan, Northern Development Corridor (CDN), Integrated Logistics Corridor of Nacala, and Central East African Railways as shareholders. It should be noted, however, that while the Nacala Corridor achieved operational success as a functioning rail and port system, it proved to be a significant financial failure for Vale, the original developer. The concession was ultimately acquired at a substantially reduced price, enabling the new operator to limit its investment requirements. Vale, for its part, made successive write-offs of several billion dollars on the project — a reminder that operational viability and financial returns for the original developer are not the same thing, and that investors and governments must treat these as distinct outcomes when drawing lessons from this corridor.

Key learnings from the Nacala Corridor

1. High export volumes can justify a one-way corridor and new mining developments.
2. Diversifying minerals and a decarbonisation strategy help secure investor funding.
3. Operations can be transferred to new operators via concession agreements.
4. Government collaboration, as with CFM, ensures operational efficiency.
5. Involving freight owners through concessions can attract private investment in infrastructure and rolling stock.
6. Operational success does not guarantee financial success for the original developer — distinguishing between these outcomes is critical for structuring investor returns.

³⁸ *Nacala Corridor: Economic Development Strategies in the Republic of Mozambique, April 2015*

³⁹ *Nacala Rail and Port Project, African Development Bank Group, 2021*

⁴⁰ *Vale announces the sale of its coal assets, Vale, 21 December 2021*

The Lobito Corridor: Strategic investment in private concessions

The Lobito Corridor is a 1,939 km rail line extending 1,289 km from the port of Lobito to the Angola-DRC border and a further 450 km into the DRC,⁴¹ with a 550 km extension to the Angola-Zambia border.⁴² Benguela Railway Company developed it to transport 20 mtpa of cargo, mainly copper and cobalt, for the Portuguese government. After the concession ended, the Angolan government restored the line using Chinese investment.⁴³ Lobito Atlantic Railway (LAR), a consortium of Trafigura, Mota-Engil, and Vecturis, operates the corridor, with Africa Global Logistics managing the ports.⁴⁴

Key learnings from the Lobito Corridor

1. Concessions to a consortium involving the private sector can attract critical infrastructure investment.
2. Railway upgrades depend on port capacity to manage export volumes.
3. Private TOCs running trains boost rolling stock availability and total network capacity.

The TAZARA Corridor: Open access for increased capacity

TAZARA is a 1,860 km rail line running from Kapiri Mposhi in Zambia to the port of Dar es Salaam in Tanzania.⁴⁵ China Civil Engineering Construction Corporation designed and built the corridor to manage 20 mtpa of freight, then handed it over to the Zambian and Tanzanian governments.⁴⁶ TAZARA allows private train operators access to its infrastructure, with two national operators and one private train operating company (TAZARA, Zambia Railways Limited, and Calabash).⁴⁷ TAZARA is implementing a PPP with China Civil Engineering for infrastructure rehabilitation and maintenance.

Key learnings from the TAZARA Corridor

1. Open access boosts rolling stock availability and increases freight volumes.
2. For the TAZARA Corridor, governments have identified that a PPP structure, including open access, is beneficial to attracting funding.
3. A single operator managing cross-border operations simplifies roles and reduces complexity.
4. Infrastructure concessions for maintenance provide a viable funding solution.

The Maputo Corridor: Private sector engagement at ports

The Maputo Corridor is a 567 km rail line running from Gauteng, South Africa, to the port of Maputo in Mozambique.⁴⁸ It transports coal, chromium ore, ferrochrome, magnetite, copper, lithium, and general freight. Trains from Transnet Freight Rail (TFR) and CFM are used on the corridor, and additional rolling stock is leased from Grindrod. Maputo Port operates under a concession to the Maputo Port Development Company, a partnership between CFM, DP World, Grindrod Ltd, and Mozambique Gestores.⁴⁹

Key learnings from the Maputo Corridor

1. For instances where TOCs cross into countries that are not their native countries, such as Transnet railing into Mozambique and CFM railing into South Africa, clear legislative and commercial agreements need to be in place to facilitate a smooth operation.
2. PSP at the port enabled it to ramp up and attract investment.
3. Leasing rolling stock from private companies increases freight volumes on the line.

⁴¹ Kamo-Kakula Exports Copper Concentrate Using the Lobito Corridor, Lobito Corridor, 3 January 2023

⁴² The Lobito Railway Corridor, The Energy Year, 14 February 2024

⁴³ The Lobito Corridor: What is it and why it matters, Lobito Corridor IPA, January 2024

⁴⁴ Lobito Atlantic Railway, Trafigura, 1 October 2023

⁴⁵ Tanzania Zambia Railways: Historical background of TAZARA, 2018

⁴⁶ TAZARA: Our History, TAZARA, 2024

⁴⁷ TAZARA and ZRL sign Open Access Agreement, TAZARA, August 2017

⁴⁸ The Maputo Development Corridor: A case study of the SDI process, Jonathan Mitchell, 27 February 2008

⁴⁹ Public-Private Partnerships: A necessary but problematic investment in Mozambique, CIP, December 2015

The Addis Ababa-Djibouti Corridor: Concessions and joint operations

The Addis Ababa-Djibouti Corridor is a 753 km rail line connecting Addis Ababa to the port of Djibouti, handling freight, passengers, and nearly all of Ethiopia's oil and 95% of Ethiopia's imports in 2018. EDR (the Ethio-Djibouti Railway) operates the trains and is 75% owned by Ethiopia and 25% by Djibouti. After a six-year concession to two Chinese firms for infrastructure management, EDR is set to take back the management. The two Chinese firms will provide two years of technical support during the gradual handover.⁵⁰ The Ethiopian government funded all rolling stock, while Djibouti's national port authority manages the port, which was recently upgraded with support from Exim Bank of China and Ethiopia.⁵¹

Key learnings from the Addis Ababa-Djibouti Corridor

1. A single country can fund all rolling stock to meet its export needs.
2. Concessions provide temporary funding and need not be permanent.
3. Joint operations by national TOCs simplify cross-border operations.

The North-South Corridor: Challenges of multi-country coordination

The North-South Corridor is a ~3,000 km rail line that runs from the DRC through Zambia and Zimbabwe to the port of Durban in South Africa.⁵² The corridor mainly transports copper from Zambia's Copperbelt and the DRC. Regional bodies such as SADC, COMESA, and East African Community coordinated the corridor's development.⁵³ However, only Transnet-owned locomotives are used on the corridor due to the poor condition of other national TOCs' rolling stock. Recently, the North-South Corridor has seen a significant decline in use, with weekly trains dropping from seven to eight in 2012 to just two in 2024. Freight volumes declined from 500 ktpa to less than 50 ktpa,⁵⁴ as shorter routes from the same production areas, such as the TAZARA route, have been introduced.

Key learnings from the North-South Corridor

1. Shorter routes can outcompete long, multi-country corridors.
2. A single country's rolling stock can serve an entire multi-country corridor.
3. Coordinating multi-country corridors, such as the DRC, Zambia, Malawi, Zimbabwe, and South Africa, requires far more coordination than is needed for a corridor that only covers two countries.
4. Regional development bodies can facilitate coordination across countries.

⁵⁰ Addis Ababa-Djibouti Railway Case Study, Global Infrastructure Hub, November 2020

⁵¹ Connectivity across borders: Addis Ababa – Djibouti Railway, The World Bank, 30 November 2020

⁵² North-South Corridor Africa's main vein, infrastructure news, 15 January 2016

⁵³ North-South Rail Corridor study: An example of what Africans can achieve when working together, NEPAD Business Foundation, 29 May 2017

⁵⁴ Railway expert interview, 2024



Learning for the Botswana-South Africa Rail Corridor:

Case studies highlight the minimum requirements and success criteria for a railway corridor, and implications for the Botswana-South Africa Rail Corridor

The railway corridor between South Africa and Botswana is a key solution to address existing logistical bottlenecks and enable new production. The elements of the railway corridor and the required investments are clearly defined. However, the exact model for its implementation and operations remains an open question. The case studies reviewed include successful and failed attempts at corridor development in Africa. Lessons learned from these case studies offer clear guidance on best practices and potential models.

Key considerations are the length and the efficiency of the corridor. A distance between 1,000 and 2,000 km is most realistic to implement. The Libya-Chad-Niger Corridor and the Trans-Sahara Corridor are ~3,100 km and ~2,600 km, respectively, and have not secured sufficient funding to be constructed.⁵⁵

At the time of construction, the North-South Corridor (~3,000km) was the most suitable route to export copper from the DRC and Zambia. The shorter Lobito Corridor was out of service from 1975 to 2014 due to the Angolan Civil War.⁵⁶ The TAZARA route was only operational from 1976, peaked in 1986, but declined afterwards due to ageing infrastructure and underinvestment.⁵⁷ Both railway corridors are active and shorter, with only two countries involved, compared to five on the North-South Corridor, rendering it less competitive.

Train traffic on the North-South Corridor dropped from eight trains per week in 2012 to just two in 2024, and copper volumes declined from ~500 ktpa to under 50 ktpa.⁵⁸

Based on a synthesis of the case studies, we identified five minimum requirements for a railway corridor to be successful:

1. The corridor must be the most efficient route possible at a sufficiently minimal length to compete with road logistics at a length that is still a realistic investment amount required for construction.
2. A business case must in place based on the freight profile of an anchor mineral that provides sufficient volumes to secure the return on investment.
3. Sufficient funding must be secured from multiple sources to cover the railway line, port, and rolling stock requirements as part of one project.
4. The respective governments must sign a cross-border corridor agreement for any corridor across multiple countries.
5. Sufficient rolling stock and train operating capacity must be secured, preferably through both existing state-owned and new privately funded entities.

⁵⁵ *Off Track: Sub-Saharan African Railways, The World Bank, November 2009*

⁵⁶ *The Lobito Corridor: What is it and why it matters, Lobito Corridor IPA, January 2024*

⁵⁷ *Chinese on track for TAZARA upgrade, Freight News, 20 August 2024*

⁵⁸ *Railway expert interview, 2024*

In addition, five success factors predict the level of efficiency in the project implementation phase:

1. The location of mineral production must allow for an efficient transportation process, which considers density, similarity of the mineral, and the place of loading and discharge. If not, the consolidation or reloading of freight will cause delays.
2. Coordinating the process to plan and develop the corridor is essential and should ideally be facilitated by a company with the necessary expertise and experience.
3. The corridor will require the support of multiple funders, which will require an investment case that projects a positive return on investment to attract investors with a purely financial interest.
4. The sustainability of the corridor requires a sustainable mix of minerals and opportunities for both exports and imports.
5. In addition to exports, opportunities for imports are important to increase the utilisation of the corridor.

Engagement of stakeholders: The implications for the Botswana-South Africa Rail Corridor require detailed planning from the initial feasibility estimates to the construction

Botswana Rail and Transnet need to engage funders and freight owners as early as possible to increase the likelihood of success.

There are two options for driving the implementation process. The first option is to appoint a developer who conducts a feasibility study (often truncated), collects funding, oversees the construction, and runs the corridor as a concession. The second option is to select an operating model that attracts funding, and thereafter source and select the implementation partners for construction and/or operations. This option is typically used for more complex projects, particularly if they include multinational setups, such as the Lobito Corridor.

Considering the Botswana-South Africa Rail Corridor includes a cross-border greenfield link, brownfield infrastructure upgrades in two countries, train operations between two countries, and multiple commodities with numerous individual freight owners, splitting the design of the operating model and financing model from the implementation seems to be the sensible approach.

A railway corridor's planning, development, and operations are most successful if strategic, financial, technical, and legal aspects are considered and factored in from the beginning. As seen in various case studies, a facilitator or Project Management Office with a full-time dedicated team can increase the efficiency and coordination to ensure successful project implementation.

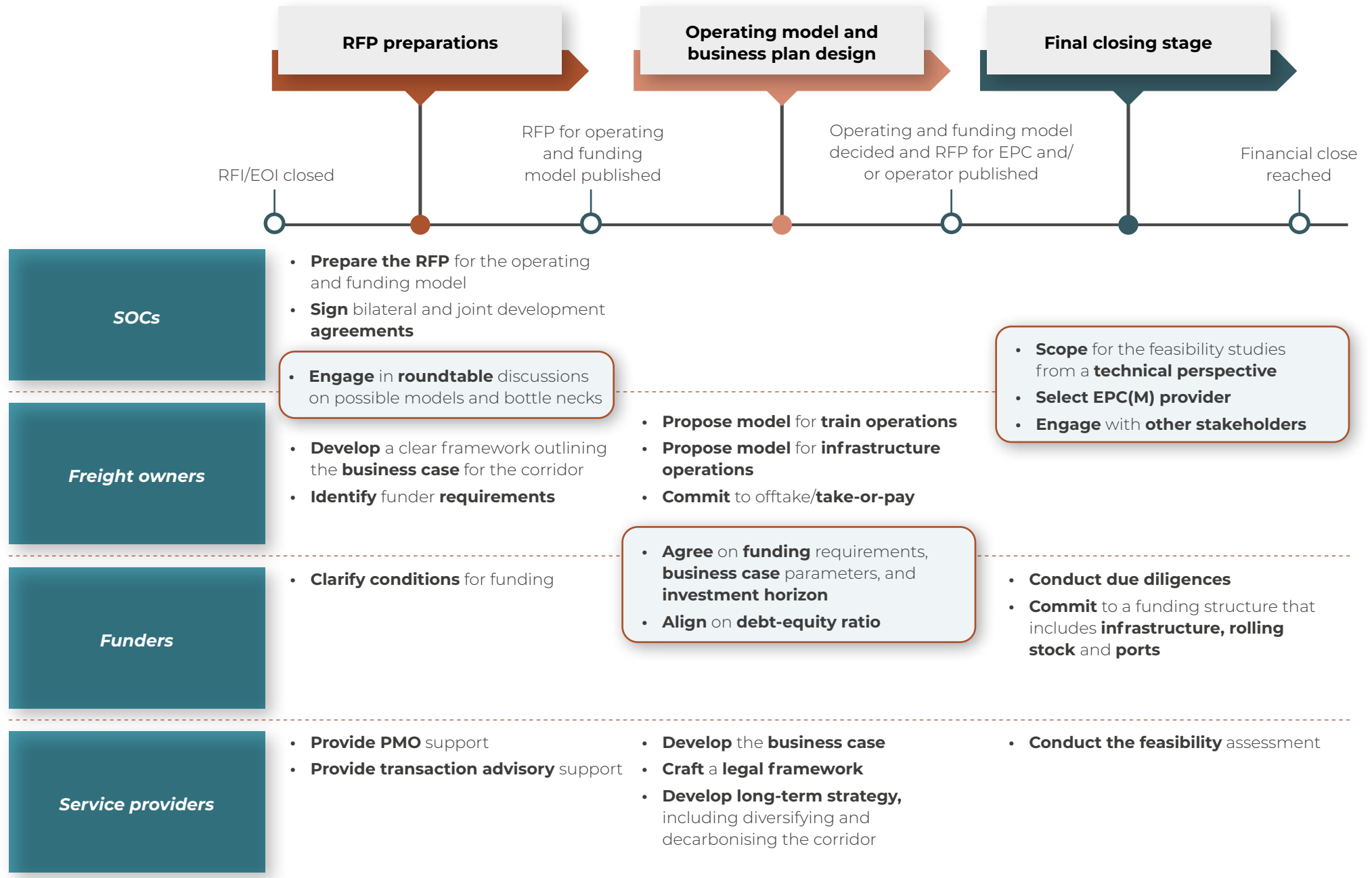
Three phases of corridor development

The interests of the key stakeholders must be aligned. Transnet, Botswana Railways and the private sector will benefit from increased freight on rail. Each party requires a sustainable business case and speedy implementation process.

Therefore, it is critical that they align and support each other in addressing concerns and in driving the process for a structured, logical, and timely implementation.

As highlighted above, the first step should be defining the operating model and the business case. The options for the operating model are highlighted in the next chapter. The operating model (who invests with which guaranteed return based on which assumptions; who operates the trains and the infrastructure over which period of time; who guarantees volumes and provides port capacity) needs to be watertight before the project can proceed to the implementation phase. The operator, EPC, and/or EPCM will be selected only during the implementation phase. Considering the aligned interests between SOCs and freight owners, implementing bodies should be selected jointly. The graphic that follows illustrates the steps that are most sensible based on various case studies.

Key success factors relating to the implementation of a railway corridor project



Options for the operating model: The case studies show three different models for the development and operations of railway corridors in Africa – in all instances, the government retained ownership of the physical infrastructure

The first group consists of solely public railway corridor projects in which the government takes leadership in planning, developing, and constructing the physical railway and port infrastructure by securing funding through third-party governments or development finance institutions.

The national train operating companies (TOCs) manage the railway infrastructure and acquire and operate trains.

- This was the default structure from colonial times, and the Lobito and TAZARA Corridors started this way.
- The North-South Corridor is an example of a railway corridor developed and operated using this structure in the last 20 years.
- Prior to the infrastructure concession granted to two Chinese firms in the 2010s, the Addis Ababa-Djibouti Rail Corridor was government-run.⁵⁹

The second model entails a PPP, either in the form of an open-access agreement, including one or multiple private TOCs on the railway that is managed publicly or a consortium or special

purpose vehicle (SPV) that comprises private and public entities and takes responsibility for the railway infrastructure and rolling stock operations.

- TAZARA allowed Zambia Railways Limited (ZRL) and Calabash Freight Limited to operate trains through an open-access agreement to increase capacity, boost revenue, and ensure the infrastructure's use is optimised and regularly maintained.⁶⁰
- The Nacala Corridor was developed through such a concession, in which a freight owner (Vale), an infrastructure firm (Mitsui), and CFM (Mozambique's national TOC) partnered to manage infrastructure and rail operations.⁶¹

The third model entails private railway corridor projects in the form of a private concession on the railway line and/or the port, either by a private entity

or a consortium, including freight owners and/or private TOCs, that manage the railway and port infrastructure and acquires and operates trains.

- The private entity or consortium invests, often through a combination of balance sheet, private or development finance institutions.
- The Lobito Corridor is an example of this structure with Lobito Atlantic Railways, a consortium comprising Trafigura, which is the freight owner that ensures efficient movement of goods along the corridor, Mota-Engil, manages the railway and port infrastructure, and Vecturis, an independent Belgian railway operator, focuses on acquiring and operating trains.⁶²

The following graphic provides an overview of this framework.

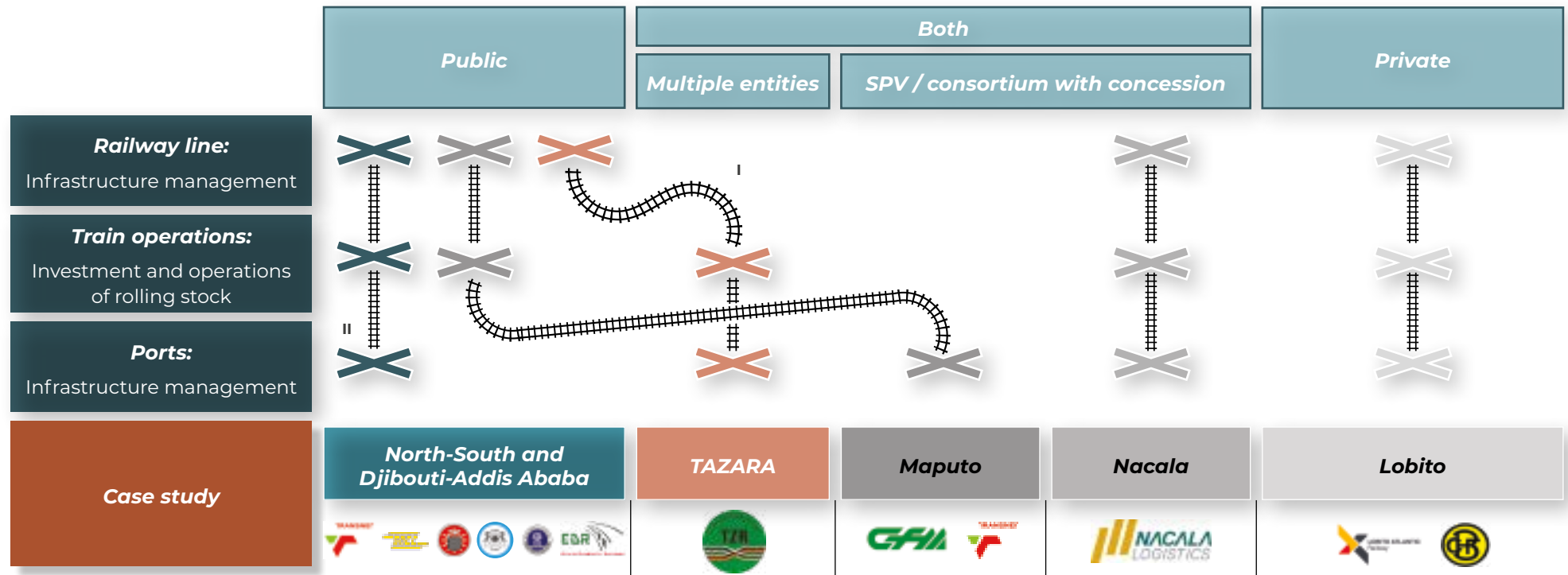
⁵⁹ *Laying the Tracks: The Political Economy of Railway Development in Ethiopia's Railway Sector and Implications for Technology Transfer*, SAIS China-Africa research initiative, January 2021

⁶⁰ *Five new locomotives to be hired*, TAZARA, 6 February 2018

⁶¹ *Mitsui to participate in Coal and Rail & Port Infrastructure Business in Mozambique*, Mitsui and Co, 9 December 2014

⁶² *Lobito Atlantic Railway*, Trafigura, 1 October 2023

Structural breakdown of corridors in case studies



I In the future, CCECC will lead the **rehabilitation** railway infrastructure

II The ports of Durban and Djibouti are **both administered by national entities**, although they have some private partners

The examples highlighted above indicate a trend towards PSP in the past 25 years. Governments and national TOCs have limited ability to invest or attract funding for the construction and maintenance of railways and ports. This has resulted in a lack of rolling stock, declining physical rail infrastructure, and rising

investment amounts required. PSP has increasingly been the lever used to unlock the requisite private investments and other sources of funding.

Examples of PSP in recent years include the Lobito Corridor, managed by the LAR concession (a consortium including a minerals trader and a

railway operator) since 2023, the Nacala Corridor, developed by CDN (a partnership which included both a freight owner and the national TOC) in 2011, and the TAZARA Corridor, which allowed Calabash to supply rolling stock and operate trains since 2017.

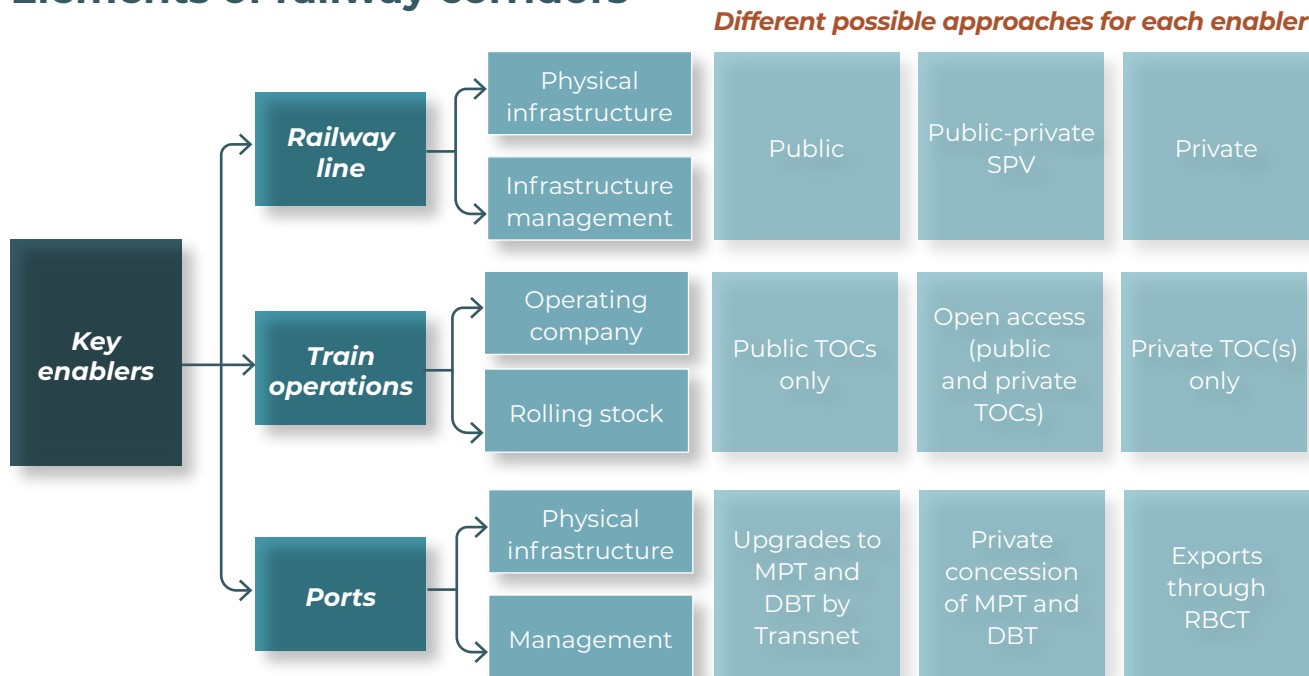


Implications for the Botswana-South Africa Rail Corridor highlight the option to choose a private, public, or PPP model for each element

Transnet and Botswana Railways must evaluate the options and identify the most suitable choice for each of the key elements of a railway corridor, namely railway infrastructure, train operations, and ports.

The three-party framework can be subdivided further. Railway infrastructure includes the physical infrastructure and its management. The train operations segment consists of the operating model and the acquisition or ownership of rolling stock. The port segment comprises the physical infrastructure and its management.

Elements of railway corridors



The first element: The railway line




The railway line describes the investment and maintenance of the physical infrastructure and the management of the railway infrastructure with three possible options. The first option is to maintain the status quo in which Transnet, through Transnet Rail Infrastructure Manager (TRIM)⁶³ and Botswana Railways, continue as the infrastructure manager. The second option is to hand over the infrastructure management to a private company in an infrastructure concession. The final option is using a joint public-private SPV to manage the corridor's railway infrastructure.

⁶³ Transnet Freight Rail has officially split into two – amid a backlash from labour, News24, 2 October 2024

Transnet is engaged in a process of rail reform in which TFR (Transnet Freight Rail) is being vertically separated into TRIM and TFROC, which are infrastructure management and rail operating companies, respectively.

Implications of these options for the railway line

Implications	Public	Public-private SPV	Private
Ability to generate corridor revenue for government	✓	✓	✓
Ability to secure funding for physical railway development	?	✓	✓
Ability to fund the maintenance of the railway line	✗	✓	✓
Ability to attract private investment in rolling stock	✗	✓	✓
Ability to ensure national TOC's role in project implementation	✓	✓	✗
Ability to build on existing expertise and resources	✓	✓	?
Ability to ensure an easy transition to the corridor model	?	✓	?

 Observed in case studies
  Not observed in case studies
  Unknown

The option where the status quo is maintained, and Transnet and Botswana Railways continue as the infrastructure manager, will require the national TOCs to set up a rail-through agreement between the two countries for efficient operations. Transnet and CFM signed a rail-through agreement to move trains directly to the port of Maputo, only stopping for a crew change-over.⁶⁴ As infrastructure managers, they will carry the burden of investing in the corridor infrastructure. As such, they will have to raise money from a development finance institution or a third-party government as they cannot attract private investments, and neither can Transnet, Botswana Railways, or their respective governments.

It has been reported that Transnet's rolling cash interest cover dropped below 2, not meeting the requirements of 2–3 by existing lenders.⁶⁵ Transnet and Botswana Railways are now seeking a service provider to “undertake the Funding and Development of the Proposed New Railway Corridor” (RFI/EOI).⁶⁶

The national railway network in South Africa has an investment backlog, while Transnet is facing USD 9 billion⁶⁷ in debt requiring capital. This is preventing Transnet from reinvesting revenues into the corridor, negatively affecting their ability to maintain the line.

The second option is to hand over the infrastructure management to a private company in an infrastructure concession. A private infrastructure manager will pay a concession fee, either a fixed fee to manage the infrastructure or a variable fee based on the actual volumes being moved on the railway line to the government that owns the infrastructure. The concessionaire, incentivised to upgrade the railway line, will be required to raise the full amount to build, upgrade, and maintain the infrastructure. This was the model used by the private developers of the Nacala Corridor and the consortium securing the concession on the Lobito 1 Corridor.

“Most miners and other freight owners (such as agricultural exporters) would seek to partner with funders like DFIs to raise the required capital and partner with EPC contractors to execute the corridor development.”

Excerpt from an Anura interview with a railway legal expert

⁶⁴ Mozambique's CFM and South Africa's Transnet sign agreement, Club of Mozambique, 4 July 2022

⁶⁵ Transnet's critical operation and financial situation extends from bad to worse, Daily Maverick, 2 January 2024

⁶⁶ Funding and Development of the Proposed New Railway Corridor RFI/EOI, Transnet and Botswana Railway, 14 July 2023

⁶⁷ “R160B investment for Transnet – what the money will be spent on”, BusinessTech, 13 February 2024

A private concession poses multiple risks that must be mitigated.

1. Specific planning and due diligence when appointing a concessionaire to ensure they can meet all financial and operational requirements.
2. The national TOCs must hand the infrastructure management over to a private party.
3. Transitioning to a private concessionaire requires integrating the railway line with the rest of the railway network.

The third option is a joint public-private SPV to manage the railway infrastructure. A public-private SPV infrastructure manager will combine the shareholding of a private company and the national TOCs, thereby ensuring their participation in the development and operations of the railway line. For example, Nacala Logistics was jointly owned by CFM (with a 5% share) and two private companies (with a combined 95% share).

In this scenario, private companies could take the responsibility of raising the required investment amount and take a majority stake in the SPV in return. The SPV will pay concession fees on the railway line as a private concessionaire would – either a fixed fee to manage the entire infrastructure or a variable fee based on volumes and capacity utilised. A PPP will make the transition period easier. Transnet has done this before when they developed Joint Operating Centres to facilitate the collaboration between multiple TOCs.⁶⁸ Therefore, this option seems the most viable and sensible as all parties would benefit.

⁶⁸ Anura Partners interview with a railway expert

The second element: Rolling stock

Train operations describe the investment in locomotives and wagons, the maintenance of the rolling stock, and the train operations, either operated by the national train operators, one or multiple TOCs or a PPP in the form of an SPV. These options have been evaluated in relation to the rail reform process currently underway in South Africa.

The first option is a continuation of the status quo, where Botswana Railways and Transnet (either through TFR or the upcoming Transnet Freight Rail Operating Company (TFROC)) continue as the sole operators on the railway line. This includes possibly establishing a single private company as the sole TOC on the railway line per the open-access model contained in the Network Statement.

“The key criteria for a good concessionaire include its size (especially with relation to the project it is undertaking) and whether it has the required technical, marketing, and management know-how. Appointing a joint public-private SPV as concessionaire is one way of ensuring all the required skills and size are present.”

Excerpt from an interview with a railway expert





Implications of these options for train operations

Implications	Public TOCs	Open access	Private TOC(s)
Ability to transition with limited changes or adjustments	✓	✗	✗
Ability to secure sufficient rolling stock	?	✓	✓
Ability to attract private investment	✗	✓	✓
Ability to increase volumes beyond current capacity	✗	✓	✓
Ability to build on existing corridor-specific expertise	✓	✓	✗
Ability for government to have oversight of train operations	✓	✓	✗
Alignment with Network Statement in South Africa	?	✓	?

✓ Observed in case studies ✗ Not observed in case studies ? Unknown

In this scenario, Botswana Railways and Transnet, through TFROC, will continue as the sole operators on the railway line, with a rail-through agreement that allows trains to operate seamlessly from Botswana to South Africa. This approach requires the least changes and will allow the operators to continue all existing contracts with freight owners. However, the challenge that Transnet currently faces is a shortage of rolling stock.

It has been reported that the total number of available locomotives decreased by 25% between 2018 and 2022.⁶⁹ This shortage of rolling stock and a lack of funding will make it very difficult for Transnet to support the 24 mtpa needed on the corridor.⁷⁰ An investment of USD 270 million will be required to increase the capacity of the North Corridor by just 8 mtpa alone.⁷¹ Consequently, the Freight Logistics Roadmap⁷² encourages private participation in the railway network.

Establishing a single private company as the sole TOC on the railway line is also an option. The second option would entail a private company taking over all operations on the rail corridor as part of a long-term agreement. Private TOCs will then have to buy sufficient rolling stock to move the required volumes on the railway line.

⁶⁹ Transnet "lost" 25% of its locomotives since 2018, news24, 14 May 2022

⁷⁰ Anura Partners interview with a railway expert

⁷¹ Calculations utilising the quantitative information cited in this report. This model assumes six train sets with six locomotives and 200 wagons each, achieving a turnaround time of four days on the upgraded Coal Line. Assuming a two-year lead time, these would need to be ordered in 2028

⁷² Freight Logistics Roadmap, South African government, 11 December 2023

“Private train operating companies (TOCs) do not have the balance sheet to invest in the amount of additional rolling stock that this corridor will require. They will need to raise money from funders who will themselves need to see long-term contractual agreements signed between governments and TOCs in order to invest.”

Excerpt from an interview with a railway legal expert



“It is important to note that the open access model still requires an effective and resourceful infrastructure manager to maintain efficiency, especially with regards to maximum train speeds on the rail line.”

Excerpt from an interview with a railway expert

TOCs with a base in South Africa that are potential national private TOCs do not have a balance sheet to invest, and will likely need to raise money to sufficiently service any major corridor. They need certainty to operate on the railway line through a concession or an agreement of no less than 20 years to operate slots. The Network Statement encourages vertical separation between the infrastructure manager and the TOC, meaning the infrastructure concessionaire is not intended to be the train operator.⁷³ An alternative would be for the private TOC to lease rolling stock from Transnet or Botswana Railways and invest in their repairs and maintenance.

In this scenario, the private TOCs will pay access fees to the infrastructure manager to operate on the railway line. A private operator on the corridor will also free up capacity for Transnet and Botswana Railways to focus on other railway lines.

A single private TOC poses the risk of a slow ramp-up should it struggle to secure the required rolling stock. Therefore, it is important to specify the requirements and the procurement plan. For example, in the case of the Lobito Corridor, the joint venture partners agreed to secure over 1,500 new wagons and 35 locomotives.⁷⁴

The last option is an open-access model, which aligns with the Network Statement, in which public and/or private TOCs will bid for slots to the infrastructure manager.

In this scenario, including multiple TOCs can potentially increase access to rolling stock and ramp up operations. In TAZARA's case, allowing a private operator (Calabash) onto the line along with the existing national operators roughly doubled the network's total freight hauled after just one year of operations.⁷⁵ This model also creates a significant opportunity for skills exchange among existing Transnet and Botswana Railways drivers and those from private partners. For example, Calabash's operations on the TAZARA line came with a skills transfer programme for local drivers. Open access requires more coordination to allocate slots to multiple TOCs instead of one single operator on the line. The infrastructure manager or an economic regulator will be responsible for monitoring the long-term behaviour of TOCs to prevent predatory pricing and ensure competition on the line remains strong, even in the long term. This option aligns most with the sentiment of the Network Statement and the required funding while allowing competition for cost-efficient operations.

⁷³ Network Statement, Transnet Rail Infrastructure Manager, 19 December 2024

⁷⁴ Lobito Atlantic Railway, Trafigura, 1 October 2023

⁷⁵ “Calabash, Advancing Africa”, Calabash presentation during ASCEA webinar, 12 October 2023

“In the case of a private concession, one way to ensure that smaller players are included, is by following the example of the CDN concession. This concession was underpinned by Vale, a global mining giant with a large coal mine (Moatize) connected to the Nacala Corridor. To ensure that CDN made room for non-coal freight, the concession came with a stipulation that coal could make up a maximum of 80% of total volume. This ensured that CDN made room for other players to move freight on the corridor in order not to impose a limit on the Moatize coal mine exports.”

Excerpt from an interview with a railway expert

The third element: The Port

For ports, different avenues to export bulk commodities at Richards Bay, which is the end destination of the corridor, as stated in the EOI/RFI, are considered below in three non-exclusive scenarios.

Implications of these options for the port

Implications	Upgrades to MPT and DBT	Private concession of MPT and DBT	Exports through RBCT
Ability to use the port without additional capital investment	✓	✓	✓
Ability to maximise utilisation of existing RB port infrastructure	✗	✗	✓
Ability to attract private investments	✗	?	✓
Ability to minimise handling costs for bulk commodities	✗	✗	✓
	✓ In place	✗ Not in place	? Unknown

The first option is to conduct upgrades to the MPT and the DBT to absorb the corridor’s additional 24 mtpa in freight volume. Both terminals will require investments for upgrades to manage the specific minerals and to increase volumes. The government-operated MPT and DBT currently have 8 and 21 mtpa capacities, respectively.⁷⁶ This represents a combined capacity of just under 30 mtpa, which will likely be insufficient to carry the additional volumes coming through the corridor. However, the publicly run terminals may struggle to attract money for these investments unless they can prove their capability to run the expanded terminals and secure the freight from the corridor.

The second option is a private concession of MPT and the DBT to secure private investments. However, private companies will likely hesitate to invest in terminal infrastructure (for coal) for a multi-decade period when a competing and highly efficient coal terminal is adjacent to the same port.

Total port and handling costs at the MPT are up to five times as expensive per tonne of coal as Richards Bay Coal Terminal (RBCT).⁷⁷

Lastly, there is the possibility to export additional volumes through RBCT. This terminal has a design capacity of 91 mtpa; however, in 2023, only 47 mtpa of coal was exported, which indicates its potential to increase export volumes.⁷⁸ RBCT represents the lowest required investment for any terminal to absorb the coal volumes from the corridor successfully. Opening up RBCT to freight from Botswana and the corridor also means that in the long term, as the coal volumes from Mpumalanga decrease due to mines reaching their end-of-life, RBCT will have an alternative source to fill its capacity, extending its profitability lifetime by many years. However, due to the diversity of freight that the corridor is envisioned to carry, RBCT (limited to handling coal) will not be a sufficient solution on its own.

⁷⁶ Port development framework plans 2022 update, Transnet, 2022

⁷⁷ Anura Partners analysis

⁷⁸ South African Coal Sector Report, Department of Energy, 2016

Critical Minerals Along the Corridor

Coal underwrites the corridor’s business case, but the Botswana-South Africa Rail Corridor traverses two of the world’s most strategically significant critical mineral geographies. On the South African side, the route cuts through the Bushveld Igneous Complex (BIC) — the world’s largest layered intrusion and the dominant global source of platinum group metals, chrome, and vanadium. On the Botswana side, it connects to the Kalahari Copper Belt, the Kanye Basin manganese province, and the eastern nickel-cobalt fields being redeveloped after the 2016 closure of BCL. Together, the corridor provides surface access to eight of the fourteen minerals designated as Critical Raw Materials under the EU’s Critical Raw Materials Act (CRMA).

The table below summarises the confirmed mineral endowment within the corridor's sphere of influence, drawing on Anura Partners' EU Critical Minerals assessments of March 2026.

<i>Mineral</i>	<i>Corridor Segment</i>	<i>Development Status</i>	<i>EU CRMA Relevance</i>
Platinum / PGMs	Lephalale–Rustenburg (South Africa)	Active production — world-scale	Automotive catalysts, hydrogen fuel cells, industrial
Copper	Kalahari Copper Belt (Botswana); Platreef byproduct (South Africa)	Active production (Botswana); active byproduct (South Africa)	Energy infrastructure, electric vehicles
Nickel	Selebi-Phikwe area (Botswana); Platreef byproduct (South Africa)	Pre-production restart; active byproduct	EV and stationary battery supply chains
Cobalt	Selebi-Phikwe area (Botswana); Platreef byproduct (South Africa)	Pre-production restart; byproduct	EV battery cathodes
Manganese	Kanye Basin — Botswana	Advanced pre-production (DFS 2026)	Battery-grade HPMSM for EV cathodes
Rare Earth Elements	Phalaborwa (South Africa); Gcwihaba (Botswana)	DFS 2026 (South Africa); early exploration (Botswana)	Permanent magnets, defence electronics
Chrome	Western Limb BIC (South Africa)	Active production	Stainless steel, aerospace alloys
Vanadium	Brits–Rustenburg area (South Africa)	Active production (Rhovan, Vametco)	Vanadium redox flow batteries, grid storage

South Africa: Through the Bushveld Igneous Complex

The Lephalale-to-Ogies section of the corridor passes directly through the Western Limb of the BIC, which alone accounts for more than 70% of global platinum supply. South Africa produced approximately 120,000 kg of platinum and 72,000 kg of palladium in 2024. The Platreef deposit (Ivanhoe Mines, Northern Limb, accessible from Lephalale), which achieved first concentrate production in November 2025, adds a polymetallic dimension: Phase 2 production from 2027 will deliver ~9,000 tonnes of nickel and ~6,000 tonnes of copper annually, rising to ~22,000 tonnes of nickel and ~13,000 tonnes of copper at Phase 3 — placing Platreef among the most significant new nickel sulphide developments globally. Two rare earth element projects are accessible from the corridor: Afrimat's Glenover carbonatite deposit (90 km northwest of Thabazimbi, phosphate production active, REE processing under development) and Rainbow Rare Earths' Phalaborwa project, which extracts separated NdPr oxide and heavy REEs from existing phosphogypsum waste stacks, with a definitive feasibility study due mid-2026 and a US\$50 million equity commitment from the US International Development Finance Corporation.

Botswana: A Critical Minerals Province in the Making

Botswana's critical minerals contribution to the corridor spans active production through to early-stage exploration across eight EU-listed materials. The Kalahari Copper Belt is in full production: Sandfire Resources' Motheo mine processed 5.6 Mt in FY2025 generating US\$314 million in economic contribution to Botswana, while Khoemacau (MMG) has produced copper-silver concentrate since 2021; BHP's commitment to explore Cobre Botswana's Kitlanya licences adds a Tier 1 greenfield dimension. Battery-grade manganese represents the highest-priority near-term opportunity: Giyani Metals' K.Hill project in the Kanye Basin holds a 15-year mining licence, a resource of 2.2 million tonnes, a post-tax NPV of US\$984 million at 8% (IRR 29%), and a definitive feasibility study targeting completion in 2026, with the commercial plant to be built under a Special Economic Zone licence. The Selebi-Phikwe nickel-cobalt fields, closed since 2016, are in active redevelopment under NexMetals, which secured clear title in December 2025 and confirmed in September 2025 a metallurgical process for separate copper and nickel-cobalt concentrates without an on-site smelter; the US EXIM Bank has issued a letter of interest for up to US\$150 million in support.

Sources

Anura Partners, *EU Critical Minerals: Lephalale-Ogies Rail Corridor*, March 2026. Anura Partners, *EU Critical Minerals in Botswana*, March 2026. Minerals Council South Africa, *Facts and Figures 2024*. Ivanhoe Mines, *Platreef Phase 2 Feasibility Study, 2025*. Sandfire Resources, *Annual Report FY2025*. Giyani Metals, *K.Hill Preliminary Economic Assessment, 2023; DFS in progress, 2026*. NexMetals, *company announcement, December 2025*. Rainbow Rare Earths, *Phalaborwa Interim Economic Study, December 2024*. EU Regulation 2024/1252 on Critical Raw Materials (CRMA), March 2024.

Strategic alignment with the EU Critical Raw Materials Act (2024)

The EU Critical Raw Materials Act targets sourcing 10% of annual consumption from domestic extraction, 40% from domestic processing, and no more than 65% from any single third country for each strategic material. The minerals accessible along this corridor — platinum, copper, nickel, cobalt, manganese, and rare earth elements — map directly onto those benchmarks. Reliable rail connectivity is the primary logistics bottleneck separating confirmed mineral endowment from bankable supply. The Botswana-South Africa Rail Corridor, once operational, would provide the only credible multi-commodity export route for this concentration of EU-relevant minerals in southern Africa.



Conclusion:

The success of the corridor depends on a beneficial operating system for all stakeholders

Considering the required investments into infrastructure, rolling stock, and Transnet's limited reinvestment capacity, the corridor cannot succeed as a solely public project. A private concession is unlikely, as the governments of both countries are closely involved in the corridor's development, and the freight and infrastructure setup is more challenging than for a greenfield project. Consequently, PPPs can unlock the full potential of the corridor. South Africa's National Rail Policy (2022)⁷⁹ and Network Statement⁸⁰ (2024) further supports the transition to open access, encouraging PSP and addressing funding and operational challenges.

The Botswana-South Africa Rail Corridor has the potential to transform regional trade and logistics, address critical infrastructure gaps, and unlock significant economic opportunities for Botswana, South Africa, and the surrounding region.

However, its success depends on addressing critical challenges that are informed by lessons from similar projects across Africa. A clear strategic framework will be essential to achieve its objectives and maximise its impact.

Shorter corridors, like the Lobito and Maputo corridors, have demonstrated the practicality of 1,000 to 2,000 km routes, avoiding the logistical inefficiencies and coordination complexities of longer, multi-country corridors like the North-South Corridor.

The route for the Botswana-South Africa Rail Corridor will secure the corridor's competitiveness with road transport and international rail alternatives.

Concessions and PPPs, as demonstrated by the Lobito and Nacala corridors, can mobilise the necessary funds for infrastructure and rolling stock while maintaining operational efficiency and accountability. However, these models require meticulous planning, due diligence, and oversight to mitigate risks and align private concessions with national networks. Public-private SPVs, such as Nacala Logistics, offer a proven framework for balancing private sector investment with public oversight and aligning stakeholder priorities while addressing funding gaps.

Diversifying freight is equally crucial. Coal can serve as an anchor commodity but the corridor's long-term sustainability and ability to attract broad-based funding requires a diverse mineral mix. This will also strengthen resilience, attract environmentally conscious investors, and support broader economic activity.

The project has the potential to attract environmentally conscious funders by aligning the corridor with global environmental, social, and governance (ESG) goals, incorporating renewable energy projects, and adopting carbon offset programmes.

Cross-border coordination remains a crucial challenge for regional corridors. A regional rail strategist noted that seamless operations across borders depend on unified management structures or rail-through agreements.

⁷⁹ White Paper on the National Rail Policy March 2022, South African government, 12 May 2022

⁸⁰ Network Statement, Transnet Rail Infrastructure Manager, 19 December 2024

Examples such as the Addis Ababa-Djibouti Corridor and Maputo Corridor illustrate the benefits of harmonising policies and streamlining decision-making to prevent delays and inefficiencies at border crossings.

Stakeholder engagement will play a pivotal role in the corridor's success. Early collaboration with freight owners, including mining companies, will help secure investment and long-term commitments.

Lessons from the Lobito and Nacala corridors demonstrate how private stakeholders can underwrite projects while ensuring capacity utilisation. Policies prioritising inclusive benefits, such as Nacala's freight diversification mandate, highlight the importance of balancing private sector efficiency with national and community interests.

Finally, risk mitigation strategies are essential. Aligning private concessions with national railway networks is critical to avoid fragmentation and inefficiencies. Development finance institutions (DFIs) increasingly favour projects that prioritise sustainability and freight diversification. Highlighting the corridors potential as a driver of non-coal freight and cleaner industries will strengthen its appeal to funders and ensure alignment with global development goals.

The corridor will strengthen regional integration under AfCFTA and enhance Southern Africa's competitiveness in global markets by enabling the efficient movement of freight, particularly minerals. Governments stand to gain from increased export volumes, reduced road maintenance costs, and increased tax revenues. At the same time, private investors can capitalise on the opportunity to develop infrastructure with enduring economic value.

Communities along the route will benefit from meaningful job creation during construction and operations, alongside long-term entrepreneurial prospects fuelled by greater economic activity and growth.

In conclusion, early collaboration among freight owners, investors, and public entities is essential to realise these outcomes. Addressing logistical and funding challenges through a well-structured PPP model, supported by rail network reforms such as open access, will be critical to achieving the corridor's objectives.

This corridor represents more than just an infrastructure project. It is a forward-looking strategy to secure Southern Africa's position in global supply chains. By acting decisively and forging solid partnerships, stakeholders can ensure the project delivers lasting economic benefits and strengthens the region's role in international trade for decades.





Annexure

Case studies: Deep dives into Rail Corridors in Africa

Railway corridors are multifaceted networks connecting mines, industrial areas, agricultural hubs, and people to local and global markets. Studying railway corridors requires significant nuance for several reasons:

- Railway corridors do not only connect two points on a map – they connect regions. This can complicate determining a single railway corridor's length (or definition).
- They often have histories that go back decades and go through phases of construction, disuse, rehabilitation, and upgrades. This can complicate the question of how much any given corridor historically cost to develop.
- Each corridor involves a large and changing group of stakeholders, from miners and investors to railway operators and port developers. This can complicate the question of how a corridor is operated.

Each railway corridor was examined in the context of its history to address these challenges. However, for analysis and comparison purposes, the report focuses on a single phase of the corridor. For example, the report refers to the Lobito Corridor as having a fully private concession. This is true for the current (2024) period but is not the only operating model the corridor has followed since its inception in 1902.

To map out the possibilities for a freight corridor solution and to inform the decision-making approach to the structure, operations, and funding of such a corridor, it is important to look across the African continent to:

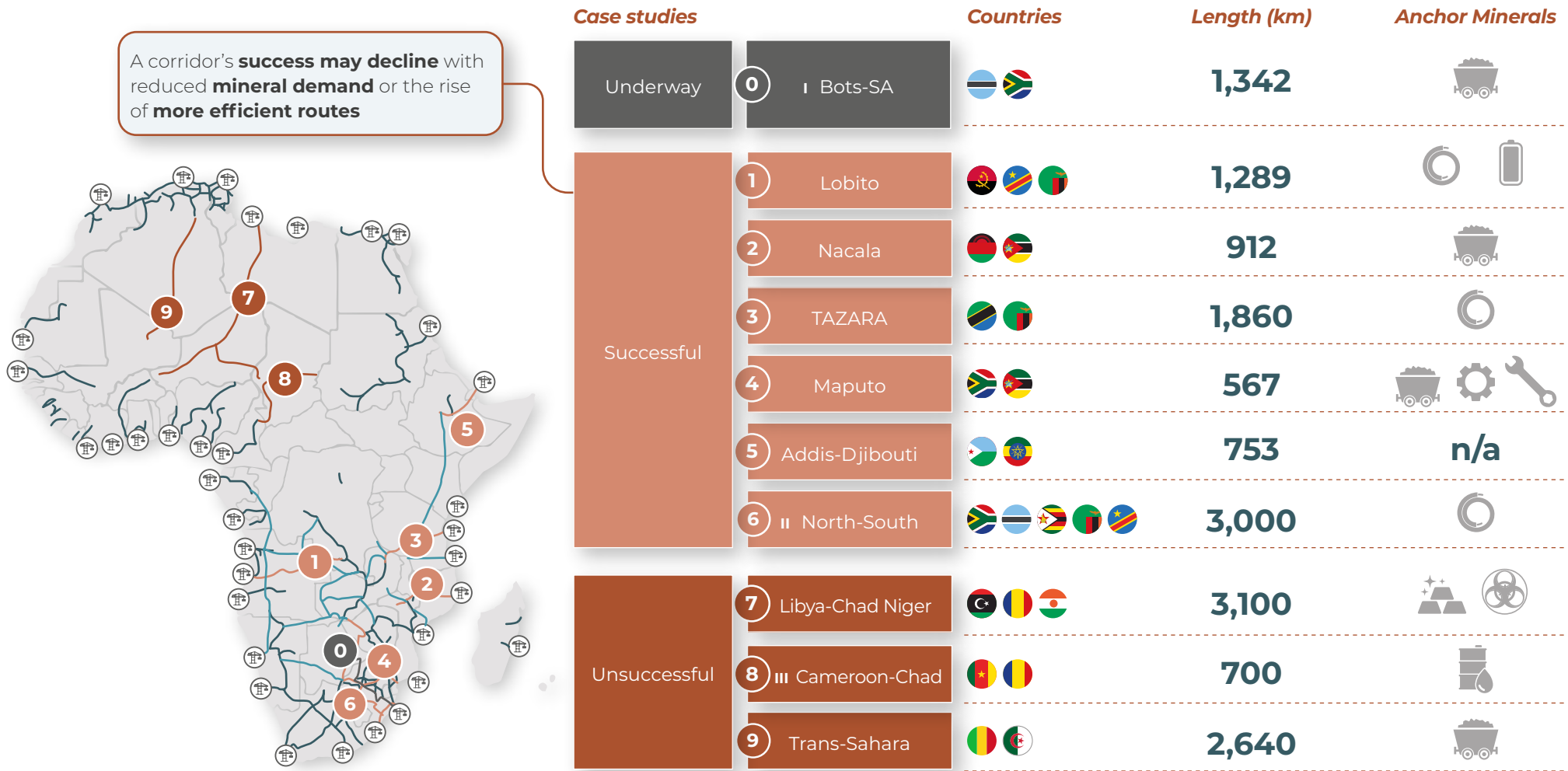
1. Understand the landscape of what is possible in an African context.
2. Understand what is required to establish a successful railway corridor.
3. Map out the success factors for corridors on the continent.
4. Develop an understanding of the levels of private participation that have proven to show success and balance the interests of all stakeholders.

Five key criteria were identified to narrow down the selection of corridors to use for the case studies to maintain the most relevance and provide the most value to the conversation around this corridor:

1. Cross-border connection(s) that link at least two countries.
2. Minimum operational duration of five years to demonstrate long-term service viability and reliability. Alternatively, a project delay of at least five years for any unsuccessful cases to learn from.
3. Facilitating freight transportation to enable exports of minerals from port(s) and across regions.
4. Varied operational models that illustrate the variations between public and private management approaches.
5. Geographical distribution among African countries to ensure the cases span multiple regions within the continent for maximum coverage.

Nine case studies were selected for evaluation and six fulfilled the above criteria. These corridors are spread across Africa and transport various minerals, as shown in the graphic on the next page.

Overview of railway corridors in Africa and case studies⁸¹










- I The **anchor mineral** for this corridor is **coal** but it will carry more **diversified freight** over time
- II **Freight** is now being **moved via Lobito and TAZARA** corridors, which is **shorter**
- III We **reviewed the Cameroon-Chad corridor project** until **1962**, at which point it was abandoned

Key

- Existing railway
- Planned railway
- Successful corridors
- Unsuccessful corridors
- Port
- Chrome
- Crude oil
- Coal
- Gold
- Copper
- Uranium
- Nickel
- Cobalt
- Potash
- Ferrochrome

Comparison of case study corridors to the Botswana-South Africa Rail Corridor









	 Bots-SA	 Lobito	 Nacala	 Maputo	 TAZARA	 Djibouti-Addis Ababa	 North-South
Length (km)	1,342	1,289	912	567	1,860	753	3,000
Number of countries	2	3	2	2	2	2	5
Anchor minerals	I Coal	Copper and cobalt	Coal	Coal, ferrochrome, and chrome	Copper	No single anchor	Copper
Start year of operations	n/a	1932	2015	2015	1976	2018	2009
II Operating model	n/a	Fully private concession	Partially private concession	Public	Public	Public	Public

I The anchor mineral for this corridor is coal but it will carry more diversified freight over time


















II In the operating model classification, ports are excluded. The partially private Nacala concession is primarily private, with a public train operator (CFM)

Key for the stakeholders shown in subsequent timeline graphics

Key

 Country responsible	 Train operator	 Port operator	 Consortium	 Construction company	 Infrastructure manager	 Funder	 Coordinating body
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Timeline for the Nacala Corridor

		2000	2011	2013	2015	2016	2021	2024	
Description		Mozambique and Malawi conducted Nacala feasibility studies	Vale and Mitsui invested USD 4.4 billion to build the Nacala Corridor	CFM provided local expertise for rail and port development efforts as a JV	Consortium completed construction , starting coal transportation to port	Consortium expanded port and railway infrastructure capacity	Vale and Mitsui exit, and the coal mine is sold to Vulcan , but CFM remains	Vulcan began cargo diversification efforts , adding agriculture	
Coordinate			I Northern Development Corridor Society (CLIN) 						
Railway	Manage								
	Maintain								
	Invest								
	Own		III 						
Train operation	Manage								
	Maintain								
	Invest								
	Own								
Ports	Manage								
	Maintain								
	Invest								
	Own								

I The **Northern Development Corridor Society (CLIN)** is a **joint venture** between Vale, CFM, and Malawi to **manage the logistics** of the corridor

II Nacala Logistics represents **several regional railway companies** and **Vulcan Resources**, which owns Moatize mine

III **Mitsui, CFM, and Vale** formed a **consortium** to jointly manage rail infrastructure and operate trains

IV By 2014, Vale had **sourced 85 locomotives** and **nearly 2,000 additional pieces of rolling stock** for coal and other goods

V **Some freight owners own rolling stock**, which CFM uses to run dedicated trains

Timeline for the Lobito Corridor

		1902	1932	2001	2002	2006	2023
Description		The Lobito Corridor was built by Benguela Railway (CFB)	CFB began operations on the Lobito Corridor	CFB's 99-year concession was terminated , and infrastructure was non-operational	Ownership of CFB was transferred to the Angolan government	I Angola secured USD 2 billion from China's rail-for-oil programme for rehabilitation	Lobito Atlantic Railway (LAR) was awarded a 30-year concession
Coordinate							
Railway	Manage						
	Maintain			II Non-operational			
	Invest						IV
	Own		III				
Train operation	Manage						
	Maintain						V
	Invest						
	Own						
Ports	Manage						
	Maintain						VI
	Invest						
	Own						

- I According to the Lobito Corridor's official website an **MoU was signed to support the Lobito Corridor's extension into Zambia**, with a feasibility study launched in 2024 and **completion projected for 2029**
- II After **27 years of civil war**, only **3%** of Angola's railways remained **operational**
- III Angola gained **independence from Portugal** in 1975, and soon descended into a **civil war that lasted until 2002**

- IV LAR received **USD 250 million** to upgrade **railway line**
- V LAR received **USD 200 million** for **rail upgrades** and to source **wagons**
- VI AGL will invest **~USD 110 million** to modernise the **Port of Lobito**

Timeline for the TAZARA Corridor

		1967	1970	1976	2010	2017	2023	2024
Description		Zambia, Tanzania and China sign agreement to build TAZARA railway	CCECC begins construction of TAZARA railway	TAZARA starts commercial operations	TAZARA signed infrastructure upgrade deal funded by China	TAZARA announced open access to third-party train operators	DP World signed a 30-year concession to operate Dar es Salaam port	CCECC signed MoU for maintenance concession of TAZARA
Coordinate								
Railway	Manage							
	Maintain							
	Invest							
	Own							
Train operation	Manage							
	Maintain							
	Invest							
	Own							
Ports	Manage							
	Maintain							
	Invest							
	Own							

- I** The **railway line** was completed two years **ahead of time** and **trial operations were performed** for a year
- II** **CCECC** will lead the **rehabilitation of** railway infrastructure
- III** China granted a **USD 39 million interest-free loan** to TAZARA for **locomotive procurement, wagon repairs, and infrastructure upgrades**
- IV** China will invest **USD 1 billion** to upgrade railway **infrastructure** and **rolling stock**
- V** China granted Tanzania and Zambia a **30-year, interest-free ~USD 402 million loan** for **railway construction, stations, a training school, and rolling stock**

- VI** Calabash brought in **24 wagons** and **two locomotives** for their operations. Open access was implemented to **increase revenue**, ensure optimal **use of railway infrastructure**, and fund **maintenance**
- VII** **Dar es Salaam Corridor Group (DCG)** began operations in Tanzania, investing in port **handling equipment, trucks, terminals and warehousing**
- VIII** **Adani Ports** began operating **Container Terminal 2** under a 30-year **concession**












Timeline for the Maputo Corridor

		1994	1996	2003	2008	2015	2022	2023
Description		I South Africa and Mozambique agreed to revive the Gauteng to Maputo corridor	South Africa and Mozambique launched the Maputo Development Corridor	MPDC was established to operate Maputo Port as a public-private partnership	Rail line from Ressano Garcia to Maputo was rehabilitated	CFM started leasing locomotives from Grindrod	II TFR and CFM implemented a through-train model for chrome and ferrochrome	MPDC secured a 25-year extension on the lease of Port of Maputo
Coordinate							III	
Railway	Manage							
	Maintain							
	IV Invest	V						
	Own							
Train operation	Manage							
	Maintain	VI						
	Invest	VII						
	Own							
Ports	Manage							
	Maintain							
	Invest			VIII				
	Own							

- I The Maputo Corridor deteriorated during **Mozambique's civil war** and **South Africa's apartheid era**
- II The **through-train model** allows transportation **without changing locomotives** at the border, which was a requirement before
- III MCLI holds **stakeholder forums** and facilitates **meetings** to address **challenges**, seize **opportunities**, and **streamline** logistics
- IV **Transnet** did not invest due to a **conflict of interest** between **Port of Maputo** and **Durban Port**

- V **CFM took charge** of rehabilitating and operating the Ressano Garcia–Maputo railway line at a cost of **USD 20 million for infrastructure**
- VI **Grindrod** leases out rolling stock to CFM
- VII **Transnet Freight Rail** provided **rolling stock** at a cost of **USD 50 million**
- VIII The **lease extension** includes a **USD 2 billion expansion** to increase port capacity from **37 mtpa to 54 mtpa** by 2058

Timeline for the Addis Ababa-Djibouti Corridor

		2007	2011	2013	2018	2020	2024
Description		Technical Advisory Group (TAG) is set up to develop a corridor framework	Construction begins with project cost estimated at USD 5 billion	Loans totalling USD 3 billion secured from Chinese financial institutions	New railway line officially declared complete	Ethio-Djibouti Standard Gauge Railway Company (EDR) established to manage operations	CREC and CCECC set to transition operational responsibilities to EDR
Coordinate		TAG					
Railway	Manage						
	Maintain						
	Invest						
	Own						
Train operation	Manage						
	Maintain						
	Invest						
	Own						
Ports	Manage						
	Maintain						
	Invest						
	Own						

- I EDR is **owned by both Ethiopia and Djibouti** in a 75%, 25% split respectively
- II Exim Bank of China funded 69% of the **new USD 590M Doraleh Multipurpose Port**

Timeline for the North-South Corridor

		1995	2003	2008	2011	2012	2013	2021
Description		The Beitbridge to Bulawayo bridge for the corridor was built	The corridor is included into the SADC Development Master Plan	SADC, COMESA and EAC form alliance to coordinate the corridor project	Feasibility studies and infrastructure project planning concluded	Construction of the several segments of the corridor begins	AfDB and JICA commit funds to Zambia-Botswana Kazungula Bridge	The Zambia-Botswana bridge and border post is commissioned by both presidents
Coordinate								
Railway	Manage							
	Maintain							
	Invest							
	Own							
Train operation	Manage							
	Maintain							
	Invest							
	Own							
Ports	Manage							
	Maintain							
	Invest							
	Own							

- I** The **Kazungula Bridge** cost **~USD 259 million**, and was co-financed by JICA (58%), AfDB (31%), the governments of Botswana and Zambia (9%), and the EU-ITF (2%).
- II** BBR is a privately owned **Zimbabwean railway operator** under **concession** backed by **Grindrod Limited**
- III** **Transnet supplied** all the **rolling stock** since other national TOCs had **poorly maintained rolling stock**
- IV** Corridor usage has **declined from 7-8 trains** per week (2012-2019) **to just two**, due to competition from **shorter routes** like Lobito and TAZARA, and challenges in managing **complex freight contracts** and **tariffs**

Glossary

AfCFTA (African Continental Free Trade Area)	A trade agreement aiming to create a unified market across African countries to boost intra-African trade	COMESA (Common Market for Eastern and Southern Africa)	An organisation promoting regional integration through trade and development for its 21 member states
AGL (Africa Global Logistics)	A logistics company focused on providing integrated supply chain solutions across Africa	Concession Model	A framework where private operators manage infrastructure or services under specific agreements with the public sector
Anchor Freight	Guaranteed, consistent freight volumes are critical for ensuring the financial viability of a railway project	Concessionaire	A private company granted operational and/or management rights for railway services under defined conditions
BOT (Build-Operate-Transfer)	A contractual model where a private entity constructs infrastructure, operates it for a fixed term and then transfers ownership to the public sector	Corridor Management Consultant	Expert involved in the planning and operational strategies of large transport projects
Botswana Railways	The national railway operator responsible for managing Botswana's rail infrastructure and operations	Crew Change Stations	Locations where operational staff are switched out to comply with jurisdictional requirements
Bulk Freight	Large-volume goods like minerals, coal, or grains transported in bulk containers	Cross-Border Rail	Railway systems that operate across national boundaries, requiring coordination between jurisdictions
Capex	Capital Expenditure: Investments in infrastructure, rolling stock, and other assets critical to the project	DBT (Dry Bulk Terminal)	A port terminal specifically equipped to handle dry bulk materials
Carbon Credits	Certificates representing reductions in carbon emissions used to offset a project's environmental impact	Development Finance	Funding from institutions focused on long-term economic growth rather than immediate profit
Carbon Negative	A term for projects that offset more carbon than they emit, enhancing their environmental credentials	DFIs (Development Finance Institutions)	Financial organisations providing funding for developmental projects, often under concessional terms
CDN (Corredor de Desenvolvimento do Norte)	A transport corridor in Mozambique designed to enhance regional connectivity and facilitate the movement of goods between the northern provinces and the port of Nacala	Diversified Freight Strategy	An approach to include various cargo types (coal, minerals, containers) to ensure operational and financial resilience
CFB (Caminho de Ferro de Benguela)	A railway company in Angola that operates the Benguela Railway, connecting Angola with the DRC	Durban Port	One of South Africa's largest ports, handling a significant percentage of SADC's freight
CFM (Portos e Caminhos de Ferro de Moçambique)	The state-owned railway and port company in Mozambique responsible for managing rail transport and port operations		

EAC (East African Community)	An East African intergovernmental organisation aimed at fostering regional economic integration	Investment Guarantee	Financial commitment by governments or institutions to reduce the risk for private investors
EDR (Ethio-Djibouti Railway)	A railway operator owned by the governments of Ethiopia and Djibouti that runs through both countries	Joint Operating Centres (JOCs)	Coordinated centres established to manage multi-operator railway logistics
EPC (Engineering, Procurement, and Construction)	A company that engineers, procures, and constructs elements of an infrastructure project	Joint Public-Private SPV	A hybrid governance model that combines public sector oversight with private sector investment
EPCM (Engineering, Procurement, Construction, Management)	A company that manages the engineering, procurement, and construction as a turnkey project	Lobito Corridor	A railway line in Angola that connects the Port of Lobito to the Democratic Republic of Congo (DRC) that is used for copper and cobalt exports
EOI (Expression of Interest)	A preliminary request issued to assess interest in collaborating on a project	Locomotive Fleet	The collective group of powered railway vehicles available for corridor operations
Environmental Approvals	Regulatory compliance requirements that ensure a project adheres to environmental protection standards	Maputo Corridor	A railway corridor that links the province of Gauteng in South Africa to Mozambique's Port of Maputo, which is used for the transportation of coal and other commodities
Freight Agreements	Contracts that guarantee specific volumes of cargo for transportation, often forming the financial backbone of a corridor	Mmamabula-Lephalale Link	A proposed 56-kilometre rail connection that is envisaged to form the backbone of the Botswana-South Africa Rail Corridor
Freight Diversification	Incorporating a mix of cargo types to reduce dependence on a single commodity	MPT (Multi-Purpose Terminal)	A port facility designed for handling various cargo types, such as break-bulk, containers, and bulk freight
Greenfield Project	Development of an entirely new infrastructure, as opposed to upgrading existing systems	mtpa (Million Tonnes Per Annum)	A standard unit of measurement for freight capacity, which is an indicator of the total amount transported annually
Infrastructure Degradation	Decline in the quality and operational efficiency of infrastructure due to insufficient maintenance and/or damage	Nacala Corridor	A 912-kilometre railway line that connects the coal fields of Mozambique to the Port of Nacala
Intent to Collaborate	A formal agreement indicating stakeholders' unified commitment to a project	Network Statement	A comprehensive document that outlines the conditions for access, use, and operation of South African railway infrastructure, including technical, safety, and capacity information, as well as applicable charges

North Corridor	A significant rail corridor in South Africa transporting coal from Mpumalanga to the Richards Bay Coal Terminal	Rail Network Manager	The entity responsible for maintaining and operating the physical railway infrastructure
North-South Corridor	A multi-country railway line that connects the DRC to the Port of Durban in South Africa	Rail Slot Allocation	Refers to the distribution of operational times and tracks among various TOCs
Open-Access Framework	A railway operational model that allows multiple operators to use shared infrastructure to encourage competition	Rail-Through Agreement	An operational agreement that allows trains to cross borders seamlessly, with minimal procedural interruptions
Port Modernisation	Upgrades to port infrastructure to increase capacity, reduce bottlenecks, and enhance efficiency	RFI (Request for Information)	A document used to gather detailed input from stakeholders to assess their capabilities
PPP (Public-Private Partnership)	Collaborative projects where the public and private sectors share the responsibilities for funding, building, and managing infrastructure	RFP (Request for Proposal)	A solicitation of detailed project proposals that typically outline specific requirements for implementation
PSP (Private Sector Participation)	An initiative in South Africa's railway sector that is aimed at encouraging investment and operational involvement from private entities to revitalise and enhance the efficiency of rail services	Richards Bay Coal Terminal (RBCT)	A major coal export terminal in South Africa with a design capacity of 91 mtpa
		Rolling Stock	Vehicles such as locomotives, wagons, and coaches that are used in rail transportation



Rolling Stock Procurement	Refers to the acquisition of locomotives and wagons that are required for operational capacity	TFROC (Transnet Freight Rail Operating Company)	A division of Transnet Freight Rail that manages rail freight operations, yard operations, train safety, and rolling stock
SADC (Southern African Development Community)	A regional organisation that promotes economic cooperation and integration among its 16 member states	TOC (Train Operating Company)	An entity that operates trains on a railway network and provides transport services to passengers or freight users
SPV (Special Purpose Vehicle)	A separate legal entity that is created to manage a particular project	Transnet	South Africa's state-owned freight logistics and infrastructure company that manages the country's rail, port, and pipeline systems
Stakeholder Engagement	The process of engaging with or including all parties (governments, private entities, communities) involved and/or impacted by a project	TRIM (Transnet Rail Infrastructure Manager)	A newly established division of Transnet that is responsible for managing and maintaining the railway infrastructure in South Africa
Sustainability Expert	A specialist who ensures that a project aligns with ESG standards	Vertical Separation	Refers to the structural split between infrastructure management and train operations to enhance competition and efficiency
TAZARA Corridor	The Tanzania-Zambia railway line that uses an open-access framework to increase freight volumes	ZRL (Zambia Railways Limited)	The national railway operator of Zambia
TFR (Transnet Freight Rail)	The primary freight rail operator in South Africa that is responsible for the transportation of goods across the national rail network		



About us

Anura Partners is an international strategy consulting firm that is committed to empowering clients in Africa and Europe to build extraordinary businesses. We specialise in mining and logistics, with a strong focus on rail transport optimisation, and leverage our expertise to drive efficiency and innovation in the sector. We believe in empowering our clients to independently drive improvements, even long after our engagement has taken place. We focus on long-term success and support our clients with our entrepreneurial mindset to build resilient businesses to become leaders in their industry. Anura Partners' strategies have helped clients unlock logistics solutions and increase revenue. Our leadership team combines more than 60 years of consulting, corporate, and entrepreneurship experience at leading strategy consulting houses, as well as globally recognised brands.

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