Modern Railway Services in Africa: Building Traffic – Building Value
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<tr>
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<td>Net ton kilometer</td>
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<tr>
<td>p.a.</td>
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<td>pkm</td>
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<td>PPP</td>
<td>Public-private partnership</td>
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<td>PRASA</td>
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<td>PTB</td>
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Introduction

The role of rail in sub-Saharan Africa (SSA) changed considerably in the latter years of the twentieth century. Fifty years ago, many of the railway systems were carrying a high share of their country’s freight traffic. Often competing road transport had poor infrastructure or faced restrictive regulations. And rail customers were established businesses with physical connections to rail with government policy encouraging parastatals to transport by rail. As transport was liberalized and roads were improved rail faced much stronger competition. Railways lost traffic and many entered a vicious cycle of decline.

Although some upgrading has occurred, most Sub Saharan Africa (SSA) networks outside South Africa are still operating to the standards to which they were originally constructed. Many structures and even some trackwork are now over 100 years old. Many railways have relatively low axle-load, low-speed, small-scale, under-capitalized networks. Combined with chronic under-maintenance over a long period of time, many sections of track have deteriorated, almost to the point of no return. This is a major handicap for railways competing against modern roads, which are increasingly being constructed in major corridors.

To encourage the commercialization of the railways and reduce the burden on government finances, several countries concessioned their rail system from the 1990’s on. Some of these concessions were successful in terms of stabilizing, or even increasing, traffic volumes. Others were less so, with some concessions being cancelled and returning to government control, albeit often at a much higher level of efficiency. One of the hopes for concessioning was that concessionaires would themselves fund infrastructure improvements. Few concessionaires had either the finances or the inclination to make such investments, as traffic demand was generally insufficient to make the investments profitable.

However, rail infrastructure improvements which encourage modal shift generate benefits from lower road congestion and maintenance costs, fewer road accidents, less pollution and reduced greenhouse gas emissions. These economic benefits to the public typically add between 20-40% to the pure financial benefits that can be captured by a concessionaire. Starting in 2005, these economic benefits were reflected in second generation concessions that shifted responsibility for funding infrastructure investment to government.

In recent years, many governments in Africa have therefore taken a renewed interest in rehabilitating and upgrading their railways, or in constructing new ones. They desire to improve their logistics efficiency and promote a green mode of transport that is less carbon intensive than road. Major new lines have been constructed to higher standards (heavier axle-loads and higher speeds), using third-party finance. However, good infrastructure, while an important pre-requisite, is not by itself sufficient to create a successful railway. It needs to be combined with a commercial business model which provides competitive levels of service, develops new markets and responds rapidly to changes in customers’ requirements.

The railways in Africa can be divided into four broad groups:

- **Mineral railways**: These railways transport several million tons of traffic per year, typically from a mine to a port. They are usually financially self-sustaining, have high-quality infrastructure and provide efficient service integrated into the main client’s operations.

- **New railways**: These railways carry both passengers and general freight on newly built infrastructure. They provide relatively high-standard services, but many are not financially self-sustaining, raising questions about maintaining the high-standard service over the longer term.
• Legacy railways: These railways carry both passengers and general freight on historical infrastructure. These railways typically have deteriorated assets and are unable to provide high quality services. They are often in challenging financial straits.

• Commuter railways: These railways carry passengers in urban areas and typically use existing infrastructure. The exception is Gautrain in South Africa which is newly built.

While the mineral railways are typically efficient and financially sustainable, many of the others face a range of challenges which can be broadly summarized as governance, funding and traffic volume. This note reviews the current situation and then discusses these challenges and possible approaches to address them.
Figure 1: Map of Railways in Sub-Saharan Africa

Click HERE for the interactive version of this map.
The Current Situation

Institutional Arrangements

Until the 1980s almost all African railway companies were publicly owned corporations, working with varying degrees of financial and management autonomy. Attempts at commercialization while in public ownership were generally unsuccessful and concessions began in the 1990s. Under these, the state remained the owner of some or all the existing assets, typically infrastructure, and transferred the other assets (normally the rollingstock), as well as the responsibility for operating and maintaining the railway infrastructure, to a concessionaire. Most countries in Central, East and West Africa have at one time or another moved all or part of the way to concessioning (see Figure 2).

Those railways that have not been concessioned or have since returned to government ownership, remain subject to significant political and governmental influence. Specific arrangements vary across countries but the sectoral ministry (normally Transport) generally exercises political and administrative control, while the Ministry of Finance normally exercises financial control. Board directors are typically a combination of ministry officials and internal senior management, themselves often appointed by the government. Oversight is nominally assigned to parliament but in practice such control may be limited to an audit of company accounts presented in its annual report, often disclosed several years in arrears. Although the governing regulatory frameworks nominally provide financial and management autonomy, in practice this is considerably limited by the many opportunities allowed for intervention by the state. This conflict between control and decision functions, and the frequent review by political authorities of initiatives and decisions under consideration by government’s authorized representatives in the corporation, does much to discourage management initiative and effectiveness.

Except for the railways immediately adjacent to South Africa, those that have not been either partly or wholly concessioned have continued to deteriorate over the past two decades. In a number of cases these declines will prove to be terminal as many railways have been left to deteriorate for too long and it will require major investment to permanently reverse the situation.

Concessions

Of the 32 SSA countries with operating railways, eighteen have opted for a concession arrangement at some time since 1992. However, seven countries have cancelled their concessions, a further four have been reassigned and two have been badly affected by war and natural disasters. The process of concessioning has often taken three to five years from concept to signed contract, and sometimes much longer, and a wide range of arrangements on cost-sharing between the concessionaire and government have been implemented.

There is little scope on most African networks for on-rail competition and few governments have seriously considered the European model of full vertical separation. There are, however, third-party operators carrying their own traffic run over government lines in Kenya and Senegal, and a through freight service operated for some years from South Africa to Tanzania.

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1 A review of the concessions operating in 2005 is given in (Bullock, Review of Experience in Railway Privatization and Concessioning in Africa, 2005) and (Pozzo di Borgo, Railway Concession Experience in Sub-Saharan Africa, 2005)
Figure 2: Public vs. Private Section Participation in SSA Railways

- **Senegal**
  - Transrail (cancelled, 2016)

- **Mali**
  - Transrail (cancelled, 2016)

- **Benin/Niger**
  - Petrolin (cancelled, 2013)
  - Bollore/Beinfra (cancelled, 2017)

- **Guinea**

- **Côte d'Ivoire/Burkina Faso**
  - Sitarail (1994)

- **Sierra Leone**
  - Shansteel Ltd (2015), SL Mining (2017)

- **Liberia**
  - ArcelorMittal (2011)

- **Togo**

- **Cameroon**
  - Camrail (1999)

- **Gabon**
  - CECF (cancelled, 2003), SETRAG (2005)

- **Angola**
  - BRC (expired, 2001)

- **DRC**
  - Sizarail (cancelled, 1997), ARC (2017)

- **South Africa**
  - Gautrain (2006)

- **Zimbabwe**
  - BBR (1997)

- **Zambia**
  - RSZ (cancelled, 2012)

- **Uganda**
  - RVR (cancelled, 2017)

- **Kenya**

- **Tanzania**
  - TRL (cancelled, 2011)

- **Madagascar**
  - Madagascar (2002)

- **Malawi**
  - CEAR (1999), VLL (2011)

- **Mozambique**

Legend:
- **Yellow**: Railway operated by state railway company
- **Red**: Private sector involved in network management or train operations
- **Black**: Railway now under private management

*Operations currently suspended.*
The concessions also do not always include the entire network with lightly used branch lines sometimes being excluded. The initial duration of concessions varies from 15 to 30 years and the concessionaire is free to operate its activity as a business, with freight tariffs generally determined by supply and demand and passenger fares subject to some form of indexation. Although formal regulatory structures with real teeth are rare in SSA, if a concessionaire fails to comply with the terms of the concession, whether by design or by force of circumstances, there are normally procedures by which the concession can be terminated. These have been applied in a number of cases, with the railway either reverting to the government or being transferred to another operator.

The rail concessions in SSA have attracted a limited pool of mainly foreign private operators. Private companies are the majority shareholders in all concessions to date. In Madagascar, the government holds 25 percent of Madarail while governments own 10-20 percent in Sitarail (Ivory Coast/Burkina Faso) and Camrail (Cameroon). This representation gives government representation on the concession company’s board and ensures that government can get adequate information on the concession company’s performance. Local private participation in concessions has generally been relatively low, and often fraught with problems during the bidding process.

The concessions have not been without problems. It was difficult in many cases to find more than a very few bidders and their financial resources in several cases were insufficient to finance the major investments required. Concessionaires were generally unenthusiastic about running passenger services, which often had regulated tariffs that did not recover the cost of the service. Delays and disputes about the payment of government compensation for non-profitable services were a challenge. Further problems arose about the level of concession fees, the length of the concession and the redundancy arrangements for the staff no longer required following concessioning. In some cases, this led to renegotiation of the concession contract.

With only a few exceptions, most concessions initially relied heavily upon the on-lending of IFI or bilateral loan to finance infrastructure. These had below-market borrowing costs, lengthy loan tenors and grace periods but were often slow to mobilize. Much of this investment addressed maintenance and renewal backlogs—without which there would often have been no functioning railway—and can be characterized as “once-off” investment to get the systems back on their feet. Most of the early concession agreements clearly put the responsibility of financing track maintenance and renewal on private operators. When rosy traffic projections failed to materialize, concessionaires lacked funds for infrastructure renewal. This was a major disappointment to many governments.

Few, if any, of the concessions which are not mineral-related are generating significant profits for their operators and certainly not enough to fund long-term renewals or improvements. While most concessionaires pay concession fees into general government revenue, none could probably even afford to do this if they were properly accruing funds for future renewals. As a result, a different model has now emerged in which governments assume greater responsibility for infrastructure funding.

Networks
Railway development followed a similar pattern in almost all SSA countries. Isolated lines headed inland from a port to reach a trading center or a mine, and over time a few branch lines were built out from the main line. Many of the lines were State-owned but some were constructed as concessions or by a mining company as an integral part of its mining operation. As a result, although there have been grand masterplans for over a century, most African lines remain disconnected, linking a port and its immediate
regional hinterland. The only significant international network is centered on South Africa, stretching north to Zimbabwe, Zambia and DRC and west to Namibia and Botswana. However, trade between African countries (other than to and from South Africa) has always been small, due in large part to the similarity in the products exported, and this suggests that such inter-regional links would be only lightly used even if they had existed.

At the end of 2019, railways were operating in 32 countries in SSA (see Figure 1 on page 3), totaling 65,760 km, with individual railways ranging in length from under 100 route-km in Togo and Ghana to over 23,000 route-km in South Africa (see Figures 3 and Figure 4).

**Figure 3: SSA Railway Network by Country (Route-km)**

![SSA Railway Network by Country](image)

Source: World Bank Analysis, most recent year available.

Most railways in SSA use either “Cape gauge” (1.067 m or 3’6”) or meter-gauge. The main network in southern and central Africa is Cape-gauge which is also used in some Anglophone countries further north. Meter-gauge is used in most of Francophone Africa and much of East Africa. There are several isolated standard-gauge (1.435 m) lines, primarily for mineral traffic although Nigeria is developing a new standard-gauge network to serve its new capital of Abuja (Box 1 and Figure 4.) Several lines with gauge as narrow as 600 mm have operated at various times, but most are now derelict. New stand-alone railways constructed in the last twenty years are largely standard gauge, including in Ethiopia, Kenya, Tanzania, Guinea, and Gautrain in South Africa\(^2\). (See Box 1.)

\(^2\) Interoperability has not been a significant issue, as few places have two gauges in the same location. This may become more of an issue as new standard-gauge lines are constructed.
Almost all the network is single-track, except for sections of the Transnet network. Much of the South African network is electrified. The only other railways with electric power supply in SSA are in the mining region of DRC, a short section (currently disused) in Zimbabwe and the new Djibouti – Addis Ababa railway. Most railways have considerable sections of track that require repair or replacement. Some countries have major sections which are not in operation and will require rehabilitation before any operations can recommence. Even where services are operated, poor track condition forces speed restrictions over long sections, resulting in a loss of railway competitiveness and rolling stock productivity.

Box 1: Railway Gauge

The discussion of railway gauge in African railways has sometimes erroneously equated “standard gauge” railway with “modern and effectively operated” railway. This is unfortunate, as modern and effective railways can be operated on many different gauges. Examples of modern Cape gauge (1067 mm) operations include:

- The railways in Japan operate over 22,000 km of 1067 mm gauge railway line, providing fast (up to 160 kph), modern, high-quality passenger services for over 20 billion passengers per year.
- The network of Australian railway company Aurizon carries over 200 million tons per year of freight (mostly coal) on a 2,670 km heavy haul (26.5 tons per axle) network of of 1067 mm lines.
- The Nacala corridor in Mozambique and Malawi, which was recently rehabilitated, now carries over 12 million tons of coal per year on a 913 km single-track, 1067 mm line.

When a country is considering investment in rail, and the proposed corridor will have dense enough traffic to make building a new railway economically and financially viable, it may want to consider a range of gauge options. Considerations in selecting gauge include ease of interchanging traffic within the country and with neighbors; suitability to the markets being served (very high speed and double stack operations require 1435mm or broader gauge); availability of track components and rolling stock; and operational efficiency.

When a country already has an existing railway, it may want to consider rehabilitating the existing railway at its current gauge, which is by far the least expensive option. Re-gauging to a broader gauge requires expanding the rail infrastructure platform, reconfiguring yards and station platforms, redesigning bridges and tunnels, so typically costs about three times as much as rehabilitating at the existing gauge. Building a new standard gauge line typically costs about six times as much as rehabilitating an existing line.* This cost consideration is especially important when the density of traffic is low—when the cost of rebuilding or building a standard gauge line may not be economically and financially viable but rehabilitating the existing line is.

* Cost comparison based on at grade construction on flat elevation, same network design, and rail and sleepers suitable for 20-25-ton axle load. The rehabilitation includes new sleepers, rail and ballast with limited reworking of the rail platform.
Signaling on many networks still relies in many cases on manual systems. On most lines, the low train density means that using mechanical signals or train orders is quite adequate from a capacity viewpoint, but there are often significant safety problems because of human error. Where power signaling is installed, it is often not operating due to lack of electricity and dilapidated cable networks. Telephone exchanges in many companies are similarly obsolete, with limited capacity and requiring spare parts which are virtually impossible to find.

In summary, most general-purpose SSA railways are confronting major infrastructure challenges. These are primarily associated with (i) aging track: insufficient ballast; rail wear (especially on curves), deteriorating earthworks and formation; (ii) civil works: most structures are in poor condition; and (iii) signaling and telecommunications: obsolete equipment and lack of spare parts. The cost of rehabilitating such lines is large compared to the existing traffic volumes and revenues. How to rehabilitate the lines on a sustainable basis is the key issue faced by most SSA railways.

Traffic

In total, the railways carried 300 million tons (181 billion ntkm) of freight and 305 million passengers (12 billion pkm) in their last reported year. These railway range in traffic from the small West African railways carrying a few hundred thousand tons and almost no passengers to South Africa with 215 million tons and 285 million passengers in 2018 (Figure 5).
Figure 5: SSA Railway Traffic (million pkm and ntkm)

Specialized mineral lines in West and Southern Africa carry over half the freight (as measured by ntkm). South Africa is by far the most heavily used network; most of this is carried on the Transnet coal and ore export lines. Southern Africa also dominates general rail freight, handling over 80 percent of the freight traffic on the non-mineral lines. It also dominates the passenger business, with over 70 percent of passenger-km, largely because of its heavy commuter passenger business. An increasing number of SSA cities also operate (or have operated) commuter services but, except for Dakar, these are generally one or two peak-hour services a short way out along the main line.

Most SSA railways are small by world standards, with the busier railways only carrying one billion traffic units per year. Transnet carries this volume of traffic every three days. In overall terms most SSA railways carry volumes similar to a moderately busy branch line on other railways. In some cases, this is due to lack of demand but in others it is caused by shortages of rollingstock, particularly locomotives.

Most railways in SSA carry far more freight than passengers. Freight averages over 90 percent of total traffic units. Almost all railways carry passenger traffic; only Swaziland and, from 1998 until recently, Uganda are freight-only railways. However, the non-urban passenger business is steadily reducing in importance and several of the railways which retain a reasonable passenger business only do so because competing road networks either do not exist or are in very poor condition. The only significant cross-border passenger flows are on the Sitarail, Transrail and Tazara networks.

While the average freight haul on SSA networks is relatively long compared to network size, it is not especially so in terms of competing with road. Some railways carry predominantly end-to-end traffic; TRC, Tazara and Transrail (when it was operating) all haul freight an average distance of 1000 kilometers. Some
smaller railways, such as Uganda or CEAR, act as feeders to other systems which subsequently on-carry the traffic a further few hundred kilometers. These systems have a good chance of competing for general freight traffic, even as the road network is improved, as long as satisfactory service levels can be achieved. However, the shorter systems which require transshipment to road at railheads will generally find they need to be innovative, efficient and customer friendly to compete effectively for bulk traffics.

Freight traffic on SSA railways is dominated by bulk and semi-bulk commodities, principally to and from ports. The actual traffics carried reflect the economic structure of the regions served by the railway. Mining products are important in several countries (e.g. Gabon, Guinea, Liberia, Mauritania, Mozambique, Sierra Leone, South Africa). Timber is important in West Africa, together with export crops. Imported flows are mostly manufactured products such as cement, petroleum products and general freight. On some systems much of the general freight is containerized (higher-value cash crops are increasingly traveling in this way), particularly when the trip involves crossing a country border before the port. Unlike for passenger services, having significant imbalances between traffic in the two directions is common. Even where tonnage is approximately balanced, the differences in the commodity mix, with many requiring specialized wagons, means trains are rarely fully loaded in both directions. In some cases, this natural imbalance in traffic is accentuated for rail as road vehicles delivering imports tend to backload freight at marginal cost, leaving rail to transport the remaining freight without a compensating return load.

Since 2005, most SSA countries have experienced steady economic growth, with corresponding increases in trade and per capita GDP. However, despite the generally favorable economic background, only a few railways experienced a growth in traffic. These include several railways with large minerals traffic—South Africa, eSwatini, Mozambique and Gabon—and only mixed traffic railway, Sitarail. When available, 2019 data for Kenya and Ethiopia are also expected to show increases. Long-distance passenger traffic has mostly stagnated or declined, apart from the services on the new Kenyan and Ethiopian lines. Suburban passenger traffic—previously almost unknown outside South Africa and Senegal—has emerged as a new railway demand.

This growth or decline of traffic has often had little to do with changes in the underlying demand. War or natural disaster has often had a major impact. On some railways the volume carried is constrained by insufficient rollingstock, particularly locomotives. Many smaller SSA railways have a low locomotive availability. When this is addressed, either through new or secondhand locomotives being obtained, or through a locomotive rehabilitation project, traffic often increases accordingly. The increase in road competition is also a key factor.

Pricing

Almost all passenger services face strong competition from buses and shared taxis in both price and service frequency. Few corridors remain in which rail passenger services are the only effective means of transport. Bus fares are typically about 30 -50 percent higher than the economy rail fares (which range from US$0.01 to US$0.03 per pkm) (Figure 6). But on most routes, buses are faster (sometimes twice as fast), with generally a much higher service frequency. Many competing bus services suffer from the same problems as rail: often unreliable departures, delays and breakdowns en route and overcrowding. Although rail is generally perceived as safer and, on some routes, allows the carriage of large quantities of produce and baggage, bus typically has the lion’s share of the market.
Average freight tariffs typically range from 3-6 US cents/net ton-kilometer, similar to tariffs on other general-freight railways in comparable countries. Tariffs are generally constrained by competition, either from road or from alternative routes (particularly in West Africa, the Great Lakes region, Malawi and Zambia) and are also influenced by the traditional value-based tariff structures, length of haul, the relative cost of carrying different commodities (as reflected in net tons per wagon round-trip), direction of travel and volume. However, in spite of most rail rates being well below comparable road rates, especially for traffics such as containers, rail typically only carries 20-50 per cent of the traffic in a corridor, and some of the smaller state-owned railways have a much smaller share.

Line-haul tariffs are only part of the price equation for freight traffic. Much is often made of the inherent lower cost of rail as compared to road. This is certainly true where minerals have to be transported from a rail-connected mine to a rail-connected port. But the advantage is less clear-cut for medium-distance general freight, which is also transported by road to and from the railheads. Haulage between the railway and the ultimate origin and destination can often cost up to the equivalent of 200 - 300 kilometers of line-haul transport, negating any advantage rail may have in pure line-haul tariffs. New sidings are sometimes constructed but these need a minimum traffic volume to be economic for a railway. Traffic which needs to be transshipped at a central depot before dispatching by rail is thus more vulnerable to road competition and even bulk traffics are not immune if distances are not too great. In many countries collection and distribution chains for many commodities are being streamlined, often involving the elimination of up-country depots and distribution centers and marketing channels have become more

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3 Other than the special case of DRC.
diversified. Railways have often been slow to respond, steadily losing market share, and this again emphasizes the need for SSA railways to actively develop efficient multimodal services specifically designed for customer needs.

Network Density

Network density is important because railways, especially railway infrastructure, have relatively high fixed costs and low variable costs. For railway infrastructure, the proportion of costs that are fixed will “differ by lines and traffic levels but rarely is estimated at less than 70 percent” (World Bank, 2017) and is often closer to 100 percent for low density lines. As a result, railway profitability is normally highly correlated with traffic density. Railways with high dedicated minerals flows thus tend to be more profitable and financially sustainable.

Figure 7: SSA Railway Traffic Density (million traffic units per route-km)

Traffic volumes on general-purpose SSA railways are low and network densities (expressed as traffic units per route-kilometer) are correspondingly low. The highest average network traffic densities outside South Africa and eSwatini are in Mauritania (12 million traffic units), Gabon (6.5 million traffic units) and Mozambique (5.2 million, largely driven by the Nacala traffic). Cameroon (1.3 million) is the only other railway to be over 1 million, although both Kenya and Ethiopia should easily reach this density in 2019. Many other railways average under 500,000 (see Figure 7). By comparison, in Europe most systems

4 The traffic units carried by a railway are the sum of the passenger-kilometers and the net ton-kilometers. Although it has some limitations as an indicator (e.g. a first-class passenger-kilometer in a TGV is treated identically with a passenger-kilometer in a crowded suburban train), it is a simple standard measure which is widely used

5 Data are mostly from 2018.
average 2-5 million, with densities below 1 million found only in Albania and Montenegro. SSA railways are therefore mostly lightly-used by world standards. Many networks struggle to generate enough funds from their own resources to maintain and renew their infrastructure as required. It is possible to operate railways without external financial support at these densities but not forever and generally only with a low level of service. For low-value traffics this is not necessarily a problem but for passenger services and for higher-value freight which is subject to road competition it is a very difficult task. If a government wants a reasonable level of service at such densities, it needs to provide ongoing financial support, as discussed further in this note.

Productivity
Both labor and asset productivity (locomotive and wagon utilization) are low in many SSA networks, compared to railways elsewhere, due to the poor condition of the infrastructure and rollingstock, low traffic levels and government ownership. However, one of the most visible characteristics of the concessions has been the sharp improvement in these indicators, partly because of growth in traffic but mostly due to major reductions in the workforces and the disposal of life-expired rolling stock.

Almost all railway companies have streamlined their workforces over the past 20-25 years. This was often the prelude to concessioning but in some cases has also been part of a general policy to improve efficiency. Despite this, labor productivity on most SSA systems is relatively low by world standards, with few railways achieving over 500,000 traffic units per staff p.a. (see Figure 8). Asset productivity is similarly low, with the root cause generally being low availability caused by lack of spare parts. The low labor productivity often reflects the continuing use of labor-intensive methods with relatively little outsourcing. But for many systems with very low productivity it is the consequence of traffic steadily declining without any adjustment to staff levels. With low wages, the direct financial impact is not always fatal. But a large body of staff who are semi-employed has a corrosive effect on morale and is a strong disincentive for those who wish to improve efficiency. It is also a powerful factor in limiting the general pay level of rail workers. Unless salary levels are competitive, railways find it hard to recruit and retain technically competent staff, or to introduce the technology required to improve service levels, for which a better-paid and more skilled workforce is essential.

Labor and asset productivity improved steadily in most concessions, typically doubling as a result of the large workforce reductions either prior or at the time of concessioning, the scrapping of obsolete rollingstock and, in most cases, the increased traffic volumes. Where concessions have been cancelled, and the railways reverted to public ownership, these productivity improvements have largely been maintained.
Safety is also an important aspect of operational performance. Rail travel is still safer than road travel but its record in SSA is much worse than comparable railways elsewhere. This is caused by a combination of obsolete track infrastructure, poorly maintained rollingstock and lack of operational discipline. However, as with productivity, safety has generally improved following concessioning.

**Profitability**

Most state-owned railways in SSA just about breakeven on a cash basis, after receipt of government support. But often this is only because a significant amount of maintenance has been deferred. When the maintenance backlog becomes too great, it is typically addressed using a loan with the expenditure being treated as investment. The two companies which have been concessioned the longest (Sitarail and Camrail) make modest cash surpluses but in recent years the substantial depreciation allowances have generated overall losses. By contrast, SETRAG, another concession, is backed by mineral traffic and makes a healthy profit which is enough to finance two-thirds of an annual investment program of over Euro 40 million.

Passenger services generally do not contribute significantly to the cost of maintaining infrastructure or to covering corporate overheads and many struggle to cover their marginal costs (train crew, rollingstock maintenance, fuel and/or traction electricity and passenger handling costs). Passenger tariffs on many railways are essentially administered, often within a framework which only includes a subset of total costs. Many of the more poorly performing systems in SSA would be unable to cover above-rail working expenses on a system-wide level even if they had freedom to set their own tariffs.
Freight services normally cover their avoidable operating costs. Some earn enough to also cover rollingstock capital costs and even infrastructure costs. This is a function of, on the revenue side, the tariff rate and the average wagon loading and, on the cost side, factors such as train size, commercial speed, and rollingstock utilization and availability. General freight can generally earn enough to make operating services worthwhile but only in some cases can fund replacement rollingstock and very rarely can earn enough to finance infrastructure renewal.

**Operations**

Operations on most general-purpose railways are inevitably constrained by the condition of infrastructure and rollingstock. The biggest single impact is probably on running time, which then feeds into low traincrew and rollingstock productivity. Where concessioning has occurred, concessionaires have generally streamlined operations and often introduced more economical procedures.

Delays at border crossings can be an issue for cross border railway operations, although some railways in Africa manage this quite well. Because many cross-border railways had originally been part of a single system,6 technical differences, such as break-of-gauge occur rarely7 and through rating is well established on most routes. International services tend to operate more smoothly when they are under the control of a single operator. Where concessions have combined cross-border operators, either deliberately (as in West Africa) or by accident (as in Zambia/Zimbabwe for some years), border procedures have often been streamlined8. Where freight is consigned to or from an inland dry port, such as between Durban and Gabcon in Botswana, border crossing delays can also be reduced to a minimum.

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6 Examples include Tanzania, Kenya and Uganda, which together operated as the East African Railways and Harbours until 1979. In West Africa, while most of the railways in what was French West Africa (except Togo) were divisions of the AOF (Afrique Occidentale Francais) Railway prior to independence.

7 Other than the new standard-gauge lines, there are only two places where metre-gauge and Cape gauge meet at the same location, both in Tanzania.

8 In the case of the Zimbabwe/Zambia border, the (at the time, common) operator streamlined customs procedures by arranging to post bonds with the full examination only occurring at Lusaka.
Prospects and Policies

Well-run railways should still offer the most economical solution for transporting non-time-sensitive general freight in major corridors in SSA for distances over 500-800 kilometers and over much shorter distances for bulk commodities. So how do countries with railways use these transportation assets in a way to realize their economic potential? Addressing these issues requires a combination of a governance framework that motivates and empowers the management of the railway to operate in an efficient and market-driven way, funding to enable railways to be financially sustainable and maintain railway assets in sound condition, and strong market development to bring traffic back to rail.

Governance

Governance means ensuring that the organization is implementing shareholder-set policy, conducting business lawfully, and performing according to expectations. For the few railways that remain as government agencies, governance is the process by which government policies are implemented, monitored, and enforced. For those which are state-owned enterprises or corporations, governance is how the interests and policies of government shareholders are represented and then implemented, monitored, and enforced. Governance thus involves setting policy, supervising its implementation, and verifying that the policy is administered properly. Where a railway has been concessioned, it is normally the responsibility of the counterparty to ensure the concessionaire upholds the policies and responsibilities articulated in the concession agreement.

Good governance for railways is governance that drives the railway to be (i) market oriented, (ii) efficient, and (iii) financially sustainable and to (iv) manage the railway assets for the long term. This requires that:

- **The railway be empowered to operate commercially, protected from those who would use its resources for personal or political gain.** Too often the railway’s staffing is padded with political patronage jobs, rates are held below costs to win votes, customers can only access the railway through intermediaries that skim off revenue or funds are outright stolen. The railways of SSA simply cannot afford such activities, moreover, they demotivate and distract railway management from operating commercially.

- **Railway management must be incentivized to build traffic, operate efficiently, strive for profitability and keep the railway’s assets in sound condition.** This requires government to implement a governance framework that creates balanced incentives to achieve the desired outcomes.

In SSA, railway operations are generally carried out by either state owned enterprises (SOEs) or concessionaires. Good governance can be achieved in either structure, just with different tools. SOEs require a transparent governance framework with their supervising ministry. For concessions, the incentives are structured into the concession agreement. Beyond a well-structured agreement, government also needs the capacity to supervise the concessionaire as well as carrying out its obligations under the concession. In either case, good governance starts with a high-level government commitment to allowing the railway to operate in a transparent and commercial fashion, without interference for personal or political gain. Without this commitment, governance tools are powerless.
Governance of Railway SOEs

Guidelines for corporate governance of state enterprises have been articulated by the OECD (OECD, 2015). These guidelines are based on the high-level principles that:

- The state exercises the ownership of SOEs in the interest of the general public. It should carefully evaluate and disclose the objectives that justify state ownership and subject these to a recurrent review. The state should act as an informed and active owner, ensuring that the governance of SOEs is carried out in a transparent and accountable manner, with a high degree of professionalism and effectiveness.

- Consistent with the rationale for state ownership, the legal and regulatory framework for SOEs should ensure a level playing field and fair competition in the marketplace when SOEs undertake economic activities.

- Where SOEs are listed or otherwise include non-state investors among their owners, the state and the enterprises should recognize the rights of all shareholders and ensure shareholders’ equitable treatment and equal access to corporate information.

- The state ownership policy should fully recognize SOEs’ responsibilities towards stakeholders and request that SOEs report on their relations with stakeholders. It should make clear any expectations the state has in respect of responsible business conduct by SOEs.

- State-owned enterprises should observe high standards of transparency and be subject to the same high-quality accounting, disclosure, compliance and auditing standards as listed companies.

- The boards of SOEs should have the necessary authority, competencies and objectivity to carry out their functions of strategic guidance and monitoring of management. They should act with integrity and be held accountable for their actions.

The tools for implementing these principles in well-managed railways often include a statement of corporate intent, a well-functioning Board of Directors, supported by auditors and other technical specialists and transparent disclosure of information.9

- A Statement of Corporate Intent is a formal commitment between the railway (via its Board) and the government entity that supervises it. It provides for a clear understanding between the supervising ministry and the railway about the Government’s objectives for the railway, how those objectives will be met and measured, and the resources that Government will provide in support of those objectives.

- The Board of Directors oversees the management of the company and represent the shareholders. Board’s responsibilities typically include setting the railway’s strategic direction, approving annual plans, monitoring the railway’s financial and operational performance, nominating/dismissing the Chief Executive Officer, and approving major investments. Board members should have a broad range of commercial and corporate experience covering areas such as finance, law and human resources. They should not be largely composed of government

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9 This section is a summary of the much more detailed discussion in Chapter 10 of the World Bank, *Railway Reform: Toolkit for Improving Rail Sector Performance*, 2017, which provides a more detailed discussion of corporate governance of railway SOEs. The annexes to the toolkit provide a model statement of corporate intent, model board charter, model ethics code and other useful material on corporate governance of railway SOEs.
bureaucrats nor have more than one or two members from the railway management. Since the Board oversees the management, the chairman of the Board should be separate from the CEO of the railway.

- External auditors test the railways’ accounting controls and verify the soundness of the railway’s financial reports. The railways’ external auditors report to the audit committee of the Board, not to the CEO. The Audit committee is be headed by an independent board member with technical expertise in the subject matter.

- Transparent disclosure of information about the railway is a key part of oversight. Well managed railways disclose their traffic volumes, operating results and audited financial statements on a timely and regular basis.

Concession

If a railway is operating as a concession, the incentives and responsibilities of the concessionaire are formalized in the concession agreement. These will include the duration of the concession and the possibility of any extension, any tariff-setting constraints, conditions surrounding possible third-party access, respective responsibilities for investing and maintaining infrastructure and rollingstock and termination/cancellation provisions\(^\text{10}\). Most of these are concerned with balancing the risks and obligations of the government and concessionaire, especially in terms of construction risk (will any proposed investment be completed satisfactorily), operations risk (can any proposed operational improvements be achieved) and market risk (will the demand projections embedded in most concession proposals be achieved)\(^\text{11}\). At the same time, governments should beware of seemingly generous concession payments that are only paid when optimistic traffic volumes are carried.

A well-designed concession will be realistic about what the concessionaire can and cannot do and set the incentives and responsibilities in the concession agreement accordingly. (See discussion below on funding.) Concessionaires do not have the same long-term interest as Government in keeping the assets well maintained and in good condition and often do not have the money to invest in them. Many of the original railway concessions in SSA have been renegotiated, because they were overly optimistic about the concessionaire’s ability to fund infrastructure investments. In many cases, the renegotiated concession returns at least some of the responsibility for funding infrastructure assets to the Government.

In a railway concession, the shareholder’s interests are normally represented by a counterparty such as a unit in the Ministry of Transport or a State Asset Supervision Committee responsible for monitoring the concession. Most concession agreements have a long list of reporting requirements with which the concessionaire should comply. Unfortunately, in practice concessions often ignore many reporting obligations under the concession agreements. This is caused, in some cases, by operator intransigence, in others by a lack of expertise or initiative by the counterparty. Failure to monitor the concession effectively and letting reporting go by default inevitably creates scope for business disputes. Under such circumstances, it is not surprising that both politicians and Ministry staff are often ill-informed about the problems facing the concessionaire and about the various steps being taken to address them.

\(^{10}\) Examples of early concessions are given in (Pozzo di Borgo, Railway Concession Experience in Sub-Saharan Africa, 2005) Annex C.

\(^{11}\) See, for example, (African Development Bank, 2015).
The counterparty needs to be effective enough to ensure there are annual independent financial and operational audits, where these are part of concession contracts. It should be staffed by practical people who concentrate on safety and on the key elements of a concession agreement, such as ensuring the infrastructure condition does not deteriorate over the life of the concession. The counterparty can also help to avoid uncoordinated actions from various ministries within governments, such as administratively imposed salary increases, operational restrictions and unfunded public service requirements imposed on rail operators. It should meet regularly to discuss any pending issues with the concessionaire and include, or have ready access to, a railway technical expert and a railway financial expert. It should report directly to at least the transport and finance ministers.

**Sustainable Government Funding**

The financial sustainability of most SSA railways is fragile, as in many other countries in the world with lower density railways. Many thus need to be supported by government funding. However, such funding should not be ad hoc but should be provided through a defined program based on specific objectives. The two most common are support payments for passenger services and support, to varying degrees for infrastructure maintenance, renewal and investment.

**Passenger services**

Several SSA cities have announced plans for the introduction of modern heavy-rail suburban commuter networks (see Box 2). Such services are currently limited to South Africa and Dakar (PTB). The modern services are not necessarily more expensive to operate (see Box 3) although capital costs are substantial. However, based on experience elsewhere in the world, any such new services will need substantial external financial support for both capital and recurrent operating costs. If implemented, they should be operated by new and independent transport authorities separate from the existing railway.

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**Box 2: Conventional Commuter Services**

An increasing number of conventional suburban rail services operate in Africa, in cities such as Dar-es-Salaam, Harare, Nairobi and Maputo. In Maputo, in addition to the government services operated by CFM-Sud, a private operator (Metrobus) started a service in 2019 which does not receive any compensation from the government and which effectively operates on a revenue-sharing basis as the access fee is based on the tickets sold by Metrobus. The fares are several times higher than those charged by CFM.
The long-term prospects for intercity rail passenger services to be competitive with bus services are generally poor, particularly as the road network compares to improve. The cost of maintaining rail track and signaling to enable commercial speeds for passenger (e.g., 70 km/hr) which are even marginally competitive with an averagely-maintained sealed road is significantly more than for the 30-40 km/hr commercial speed needed for a freight railway and very large capital expenditure is required to construct new medium-speed (say 200 km/hr) interurban railways. The latter expenditure needs substantial demand (several million passengers p.a.) as well as relatively high-income passengers to even cover the cost of its operation (See Box 4). There are few, if any, corridors in Africa in which such expenditure could be justified for at least the medium-term.

The few instances in which local trains serve villages with no road connection pose a different problem. These are often used by traders carrying goods to and from regional centers and are often well-patronized but generate operating losses for the railway. While such services can be funded through explicit payments by governments, it is always worth checking if there are more cost-effective means of goods transport, which can often also greatly improve the general level of accessibility for such locations.

If governments wish passenger services to be operated by the railway, there should be clear compensation arrangements which can be easily monitored. Few passenger train services are likely to cover even their above-rail costs. Their financial contribution to infrastructure costs is generally minimal and few services would justify investment in rollingstock, be it loco-hauled or self-propelled. In at least one concession, Camrail, this was recognized with the government being responsible for passenger rollingstock investment. However, in another long-established concession, Sitarail, the concessionaire is responsible for any passenger-related investment while committing to operate three international passenger services per week.
Many passenger services in Africa are trapped in a cycle of minimal investment, deteriorating services, declining patronage and financial losses. If Governments wish to retain them, Governments must ensure there are simple compensation schemes to at least cover above-rail operating costs, for which the payments need to be made in a timely manner and with a minimum of fuss. Any scheme should be capable of being easily audited and should be reviewed periodically, say every five years. Without any such scheme, passenger services can easily become a constant bone of contention between the government and the railway. This diverts the focus of the railway from the freight services, the improvement of which is of far greater economic importance to the country.

Infrastructure
Most railways can earn enough revenue to cover the cost of operating freight services, although some with very low traffic density may not earn enough to be able to renew their rollingstock as it falls due. Some railways may even be able to earn enough to cover the cost of running their passenger services. But the cost of maintaining and renewing infrastructure is a perennial problem.

The first hurdle is to be able to undertake current maintenance - the routine inspections, drainage, spot track and sleeper replacement and so on. Every few years, at regular intervals, railways also need to undertake periodic maintenance – principally tamping. Finally, the track, sleepers and ballast will all need to be renewed, typically every 30 to 40 years. Railways with high traffic density, in SSA typically the minerals railways, will be able to earn enough to undertake all three of these activities—current maintenance, periodic maintenance and renewal. Railways with lesser traffic density, in SSA the legacy general freight railways, will typically only be able pay for current maintenance, or at most current and periodic maintenance.

A purely privately-financed rail concession model which relies on general freight traffic has doubtful sustainability in much of Africa. Track structures have (or should have) lives of several decades, given the traffic volumes typically carried on an SSA railway, as long as they are maintained properly. On a small system, therefore, track renewal is an irregular event which only occurs somewhere on the network every twenty years or so. It is almost always possible to defer renewals for several years, albeit at the cost of deteriorating track conditions and steadily reducing operating speeds. For any concession which is uncertain of its long-term future, and which generally would have to borrow significantly to undertake the works required, the safest decision is thus to do as little track renewal as possible. If the infrastructure is to be maintained in reasonable condition, either returns to the concessionaire need to be boosted, or supplementary funding sources developed, or both. Without these the only classic concessions in SSA likely to be financially attractive to bidders are those where there is a substantial potential long-term traffic (e.g. Nacala) or there are potential financial benefits not directly linked to the railway operations (e.g. by combining port and rail operations or by development of railway land).

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12 For example, a scheme in which the concessionaire keeps all the revenue, to encourage him to operate as attractive a service as possible and is given a contribution per carriage-kilometer (say) towards the cost of running the service.
13 Concessions that require the private operator to make a significant investment, either for rehabilitation or renewal of assets.
14 Other examples include controlling the entire distribution chain or through the supply of rail equipment and services.
Often a large gap exists between government expectations of what concessioning can achieve (often fueled by persuasive project promoters) and what transpires once the concession has been awarded. The volumes on most SSA railways are low, often around that of a moderately busy branch-line in many countries, and can commercially justify no more than infrastructure being maintained to allow operation at a speed of 60 - 80 km/hr at best. Such a speed cannot permit an attractive passenger service except where there is no practical alternative, an increasingly rare situation. Governments which are not prepared to invest substantial sums of their own funds in upgrading and maintaining infrastructure should therefore only expect a ‘fit for purpose’ freight railway which operates at moderate speeds but does so reliably and safely. This type of railway can often be successfully operated under concession at the traffic densities which are typical of SSA. But if traffic volumes are very low (say 500,000 tons p.a. or less) or if high-standard passenger services are expected, government must provide continuing financial support even for some components of current maintenance.

SSA railway concessions in the past generally required concessionaires to make substantial commitments to rehabilitate and renew infrastructure. Several of these concessions have run into problems and had to be renegotiated. For railways with low traffic density, the government should expect to fund infrastructure renewal. Madarail maintains the infrastructure and pays a 6 percent share of revenue for its use. The Government of Madagascar (GoM) is required to put money in the Fond d’Investissement Ferroviaire (FIF) for infrastructure renewal. The account is managed by Madarail on behalf of GoM.

**Box 5: Madarail Concession**

The Madarail concession was restructured in 2005. In the restructured agreement, the state is to fund rail infrastructure renewal. Madarail maintains the infrastructure and pays a 6 percent share of revenue for its use. The Government of Madagascar (GoM) is required to put money in the Fond d’Investissement Ferroviaire (FIF) for infrastructure renewal. The account is managed by Madarail on behalf of GoM.

**Box 6: Balanced Financing of Road and Rail Infrastructure**

Governments should develop a coherent and realistic policy for transport infrastructure cost recovery from users. The lower the road user charges are below cost, and the greater the degree of overloading permitted, the lower the freight rates by both road and rail will be and the less the funds available from a concessionaire to maintain and upgrade both the road and railway infrastructure. Requiring rail (and in practice this means freight rail) to fund 100% of its long-term maintenance and upgrades, while tolerating road cost under-recovery and overloading on arterial routes, may help Government budgets in the short-run but is an almost impossible handicap for most general freight railways to overcome in the medium and long-term. Rather, Governments should strive to recover the same level of infrastructure costs from road users through tolls as from railway users through tariffs.

More generally, all Governments who wish to retain an effective railway will need to support railway infrastructure maintenance and investment, just like they support road infrastructure maintenance and investment (see box 6). Failure to maintain will result in long-term deterioration of the infrastructure, which, when it eventually has to be fixed, will cost much more than if the infrastructure had been properly maintained in the first place. In the meantime, this deterioration all too often results in a vicious cycle of lower-quality services, shrinking traffic and market share, deteriorating assets and lack of financial sustainability.

Table 1 shows the typical freight traffic density where governments will need to contribute to
railway infrastructure maintenance, renewal and new investment for the railway to function effectively. Although the precise thresholds will vary depending on the circumstances of particular railways, these are likely to be representative of most well-run railways, whether an SOE or concessioned.

### Table 1: Typical Allocation of Infrastructure Funding Responsibility

<table>
<thead>
<tr>
<th>Traffic Density (million net tons)</th>
<th>Maintenance</th>
<th>Renewal</th>
<th>New Investment</th>
<th>Number of SSA Railway</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1</td>
<td>Shared</td>
<td>Government</td>
<td>Government</td>
<td>22</td>
</tr>
<tr>
<td>1 – 3</td>
<td>Railway</td>
<td>Government</td>
<td>Government</td>
<td>1</td>
</tr>
<tr>
<td>3-7</td>
<td>Railway</td>
<td>Shared</td>
<td>Government</td>
<td>6</td>
</tr>
<tr>
<td>7-10</td>
<td>Railway</td>
<td>Railway</td>
<td>Shared</td>
<td>0</td>
</tr>
<tr>
<td>10+</td>
<td>Railway</td>
<td>Railway</td>
<td>Shared/Railway</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: World Bank analysis-based on average revenue of 6c/ntkm; new construction at $3 million/km*

### Market development

Railway traffics come and go. Even those whose volumes have been stable for decades can decline, sometimes quite suddenly. Therefore, continually developing new markets is important. Experience in many SSA countries has repeatedly demonstrated that general freight transport operators need to be flexible, responsive and capable of adapting to changing circumstances. Fewer and fewer customers are fellow parastatals directed to use the railway. Most railways operate in a fully competitive environment. Moreover, with improvement in road transport customers with wagon load or less than wagon load business—historically an important source of traffic for general freight railways—find door-to-door truck services easier to use than railway.

To attract this business back, railways must position themselves as the reliable, low cost service providers on key transport arteries and interact seamlessly with road carriers to deliver door-to-door service to the customer. The railway does not need to control the whole service—this can be done by 3PL companies or others. The railway does need to design its part of the service in coordination with the other actors and deliver on reliably. To channel traffic toward the railway, critical hubs must be developed to consolidate freight. (Aritua, 2019) They need to be located to be convenient for the customers (not just the railway) and the overall transport service needs to be tailored to the particular requirements of individual customers or groups of customers.

Many railways in SSA are locating container hubs in inland cities (see Box 7). The railway typically moves the containers between the hub and a port, and the hub may also be a dry port offering customers clearance services.

**Box 7: Johannesburg – Durban Container Traffic**

Durban is by far the busiest container port in South Africa and import/exports about 2.4 million TEU of containers each year. About 70% of this freight is bound for Johannesburg and beyond. About half is unstuffed in Durban and reloaded onto high-capacity road vehicles for transport to Johannesburg on a good expressway (570 km). The railway transports about 40% of the remaining unstuffed containers, largely to the important terminal (and dry port) of City Deep. With improvements in service, it could expand this market share.
An example of a more modest scale hub is Bobo Dioulasso in Burkina Faso. This location has historically been a major hub for traffic to Mali from Abidjan. Although most of this traffic is inbound, Sitarail has developed an export trade in fresh fruit using combined road-rail operations (see Box 8). Another example of a new hub being developed to attract rail business is in Gabon, where SETRAG established a new loading point on the railway to export logs from Congo Brazzaville, which were otherwise being transported by road.

Successful freight rail marketing, as in the last two examples, is greatly helped by a railway being clearly separated from government and, in particular, having the freedom to set its own rates without having to refer them to third parties for approval. Although government railway managements are often criticized for lack of initiative in developing markets, experience has often shown that those same managers, when freed from these external constraints, are as innovative and active as any manager from the private sector. Naturally, if a railway is concessioned, developing the market and increasing traffic is a high priority but, if concessioning is not an option, providing much greater managerial freedom can generate significant traffic gains.

These examples demonstrate it is possible to design a service which can meet the needs of the customers and beat the competition. The three key steps are:

- Understanding the market and the needs of the customer is an essential first step. Customers might be individual shippers, or they could be (and in some countries these are the most important) forwarders and 3PL operators. Without this, any railway-originated proposal is going to be hit-and-miss in terms of being successful;
- Understanding the competition is key to knowing what the performance characteristics of any proposal need to be in terms of door-to-door cost, transit time, service frequency and reliability.
- While a railway will rarely be able to match the competition in all four of these areas, armed with the above information it should be able to provide trade-offs which will make rail a more attractive proposition overall. For general freight, this is increasingly leading to the establishment of strategically located hubs which can consolidate freight for efficient line-haul carriage by rail.

**Operational efficiency**

The SSA railway workforce needs to become more technically skilled as modern rail technology is increasingly introduced. The need for capacity building is evident at all levels. Policymakers need strengthened skills in areas such as safety regulation, oversight of concessions performance, and analysis of railway investments. Railways need technical skills related to operating and maintaining railway infrastructure, signaling and telecommunications systems, information technology and rolling stock. Many railways also need to build business skills such as marketing, accounting and finance.

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**Box 8: Mangos from Bobo Dioulasso**

Sitarail developed a new export traffic of mangos from the hinterland of Bobo Dioulasso by providing a combined road-rail service using refrigerated containers. These are transported empty from the port to the orchards, loaded while refrigerated and then returned after transshipment from road to rail at the terminal. The entire operation is controlled by Sitarail to ensure the quality of the fruit, which is then exported to prime European markets via Antwerp and Rotterdam.
While many staff can be successfully retrained. Others may find adapting difficult. Such situations are normally only resolved with carefully designed early retirement and voluntary redundancy schemes, with special attention to pension obligations. Railways do not need to be concessioned for such schemes to be introduced but they then need a strong Board as well as (normally) financial support from the government.

Trainworking is a key area where such changes are common, with many small railways persisting with obsolete equipment and operating practices. In such situations, some level of re-equipment is required for the railway to operate effectively and this needs care to ensure that changes to long-established operating procedures do not prejudice safety.

Increasing operational efficiency does not necessarily mean investing heavily in high-standard infrastructure and the most modern rollingstock. Level of service is a key factor in the freight business. While transit time needs to be acceptable, for rail to play a significant role in the general freight transport system it must address factors such as overall transit time, reliability, security and service frequency, and ensure it is addressing the needs of customers. In too many cases, what rail has offered as “transport” has been a totally different product from what the competing road hauler has been offering, and for which road is able to charge a significant premium. In general, freight markets in Africa require reliable services (a commercial speed of 40 km/hr is generally quite sufficient) rather than high-speed services, with rail infrastructure and rollingstock maintained to be ‘fit for purpose’, operating discipline to ensure schedules are maintained and commercial arrangements that ensure customers fulfill their contractual responsibilities. But, as with marketing, improving efficiency will generally happen faster\textsuperscript{15} if a railway is concessioned.

\textsuperscript{15} Some detailed examples in Africa are given in Bullock (2005). Similar examples are given in a companion volume on South American concessions by Sharp (2005).
Conclusions

Countries should build new railway line where traffic density is, or has the potential to be, high. Railways because of their cost structure are density businesses. They have high fixed costs (especially for infrastructure) and low variable cost. This makes them economically valuable in places with dense traffic flows. Examples of new rail construction to serve high density traffic flows are the Ethiopia-Djibouti railway line (with about 20 million tons moving by road in the corridor) and the Nacala corridor in Mozambique and Malawi, which currently moves 12 million tons by rail.

Countries that already have railways will want to manage them to yield the maximum economic benefit. Many countries have railway lines that were built in a different era and for different purposes than are relevant today. These railways are tremendous potential assets but need to be repurposed and revitalized to realize their economic potential.

Three key elements of this transformation are good governance, adequate funding and market development. These elements are mutually reinforcing. No one by itself is sufficient. As shown in Figure 9. they are mutually reinforcing and all three are necessary.

Figure 9: Virtuous Cycle of Railway Revitalization

Good governance drives the railway to be market orient, efficient, financially sustainable and manage the railway assets for the long term. This requires that:

- The railway be empowered to operate commercially, protected from those who would use its resources for personal or political gain; and
- Management incentives balance building traffic, efficiency, profitability and care for the railway’s assets.

This can be achieved in a well-structured PPP or in a well-managed SOE. The tools are different—a concession contract vs. a corporate governance framework—but either can work. Governments may reflect on how good governance is best achieved in their environments.
Railways need adequate government funding to sustain assets and operations. This include both support for social services and support for infrastructure. Government must pay for any loss-making passenger or lifeline freight services it requires the railway to provide. Beyond that, Government must support the provision of railway infrastructure, just as it does for road infrastructure. How much of the cost of infrastructure is reasonable for government to support and how much can be covered by profits from freight traffic depends on traffic density.

Building railway freight traffic contributes to both the country’s economy and the railway's financial sustainability, reducing the support needed from government to sustain assets. This requires the railway to design and deliver services that meet customers’ needs and are competitive with other (typically road) options.

- Railways will continue to be the mode of choice for high volume, unit train transport of minerals. They can and should continue to provide this “purpose built” service.
- Railways can also become the arteries of the transport network, working with logistics service providers and road transporters to develop hubs for channeling traffic to rail and establish high quality, reliable multimodal services.

The key policies for implementing the three elements vary somewhat by type of railway and whether the railway is public or private (Table 2).

Table 2: Key Policy Issues by Railway Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Element</th>
<th>Public</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Freight</td>
<td>Governance</td>
<td>- High level commitment to commercial operation of the railway</td>
<td>- High level commitment to commercial function of the concession contract</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Gov capacity to oversee sector policy, regulation, ownership of railway</td>
<td>- Gov capacity to oversee sector policy, regulation, railway concession</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Infrastructure cost recovery from users balanced between road and rail; sound enforcement of axle loading limits</td>
<td>- Gov commitment to delivering its obligations under concession contract</td>
</tr>
<tr>
<td></td>
<td>Traffic</td>
<td>- Railway incentivized &amp; enabled to build traffic</td>
<td>- Concession contract encourages building traffic</td>
</tr>
<tr>
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<td>• Gov capacity to oversee sector policy, regulation, ownership of railway</td>
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<td>• Infrastructure cost recovery from users encourages bulk traffic to stay on rail; sound enforcement of axle loading limits</td>
<td>• Gov commitment to delivering its obligations under concession contract</td>
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<td>• Infrastructure cost recovery from users encourages bulk traffic to stay on rail; sound enforcement of axle loading limits</td>
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<td>Traffic</td>
<td>• Railway incentivized &amp; enabled to serve primary customers &amp; build traffic</td>
<td>• Concession contract encourages building traffic</td>
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<td>• Customer investment in railway facilities &amp; rolling stock encouraged</td>
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<td>• Gov commitment to delivering its obligations under concession contract</td>
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<td>Traffic</td>
<td>• Railway incentivized &amp; enabled to build traffic</td>
<td>• Concession contract encourages building traffic</td>
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<td>• Multimodal transfer facilities/ticketing &amp; Private sector partnerships encouraged</td>
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<td>Funding</td>
<td>• PSO or PSC contract that provides reliable funding for both operational deficit and capital expenditure</td>
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Implementing these three elements—good governance, adequate funding and building traffic—will support a renaissance of railways in Sub Saharan Africa. It will enable SSA railways to contribute to economic growth in a climate friendly way, improving transport to improve lives.
Resources


# Annex 1: Rail Networks in Africa

<table>
<thead>
<tr>
<th>Countries</th>
<th>Companies</th>
<th>Operating lines (km)</th>
<th>Network density</th>
<th>Gauge (mm)</th>
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