

# RAILWAY INFRASTRUCTURE IN SUB-SAHARAN AFRICA



International railway policy consultant and former World Bank railways adviser **Louis S. Thompson**, principal of **Thompson, Galenson and Associates** outlines railway infrastructure challenges in sub-Saharan Africa and the potential for domestic and foreign investment.

Sub-Saharan Africa (SSA) is a sub-continent of enormous distances. Though the SSA region remains one of the world's poorest and least developed areas, it has long produced the types of agricultural commodities and mineral ores that would normally have mandated adequate rail transport. Indeed, the early economic development of the area was based on foreign (mostly colonial) investment in and management of railways, which were constructed to move the region's commodities to ports for export to developed economies. As in Latin America, the colonial era railways played a major role in the economies of the countries they served.

As the colonial era ended, the SSA railways entered a long period of fiscal and physical decline

caused largely by instability in the economies they served and the inability of their new government owners to provide adequate finance or management. Linked to this problem was the fact that most African railways were at inception lightly and cheaply constructed and political fragmentation in the SSA region created barriers at borders. These barriers deprived many of the SSA railways of the length of haul that would have permitted them to compete more effectively with other modes. In addition, the railways' chief freight competitor, trucking, tended to function somewhat better than railways in the chaotic transport competitive markets in SSA, even though the condition of the region's highways was not much better than the railways.

The eventual result by the end of the 1980s, again much like that of Latin America, was a rail network that was making financial losses, poorly maintained, inefficient in its use of capital and labour and ineffective at serving its customers. Passenger traffic was for the most part long-gone and freight traffic was heavily dependent on basic mineral flows within one country, or on mandated traffic from other public enterprises. In fact, the network actually constituted a net drain on the national economies. This has been particularly unfortunate for the area because many of the countries are landlocked and therefore heavily dependent on transport connections through other countries. Moreover, inefficient

Figure 1. Overview of the SSA rail network  
 Italic indicates number estimated from closest available year.

\* All meter or Cape gauge except Gabon

\*\* ton-km/(ton-km+Pass-Km)

	Route Km	Passenger-Km (000,000)	Ton-Km 1980 (000,000)	Ton-Km 2008 (000,000)	Percent freight **	Traffic Density (000 of TU per Km)
Botswana	888		600	674	100.0	759.0
Cameroun	1006		578	978	100.0	942.2
Congo-CFCO	795	135	<i>500</i>	352	72.3	612.6
Cote D'Ivoire/Burkina Faso	1245	181	602	800	81.5	788.0
Gabon	731	92	25	2485	96.4	3525.3
Ghana	1300	85	119	<i>200</i>	70.2	219.2
Kenya	2634	288	2281	<i>1400</i>	82.9	640.9
Madagascar	854		<i>100</i>	109	100.0	146.8
Malawi	710	19	234	51	72.6	98.9
Mali	734	204	132	<i>200</i>	49.5	550.4
Mozambique (Beira)	725		<i>700</i>	695		9586
Namibia	2382	49	<i>1500</i>	<i>1000</i>	95.4	440.2
Nigeria	3557	363	822	77	17.5	123.7
Senegal	906	138	307	<i>300</i>	68.5	483.4
South Africa	20,247	991	99,556	113,341	99.1	483.4
Sudan	5478	40	1970	<i>766</i>	95.0	5646.9
Swaziland	301		300	<i>384</i>		1275.7
Tanzania	2722	433	700	<i>500</i>	53.6	3428
TAZARA	1860	518	1106	<i>500</i>	49.1	547.5
Uganda	259		90	<i>200</i>	100.0	772.2
DR Congo (NWCC)	3641	140	1727	<i>400</i>	74.1	148.3
Zambia	1273	186	1386	<i>600</i>	763	617.4
Zimbabwe	2759	583	6864	1580	73.0	784.0
TOTAL	56,546	4445	122,199	127,683	966	2336.6

transport, including rail, has been a heavy drag on all parts of the SSA economies.

### ATTEMPTING AN OVERVIEW OF SSA RAILWAYS

It is difficult to provide a complete or accurate description of the SSA rail network, as there are no complete datasets and where information does exist, it is often questionable. The table in figure 1 is provided to give a general overview, but many of the numbers are approximate or estimated and the information should only be

used to assess the overall picture. A number of conclusions emerge from the table:

1. South Africa is dominant. While the South African railway (Transnet Freight Rail, formerly called Spoornet) represents just over one-third of the line-km in the SSA area, it carries nearly 90 per cent of the freight traffic. This suggests two categories of railways – South Africa and the rest.
2. Essentially all of the SSA railways are meter or Cape

gauge (3'6"/1067mm). While Transnet Freight Rail has two lines (Saldanha carrying export iron ore, and Richards Bay carrying export coal) that operate at world traffic density levels, most meter and Cape gauge railways were originally built for light density operation in relatively difficult terrain. Most permit only very light axle loading and as a result, inherently have higher costs than more sturdily constructed railways. One result of the low line



capacity is that the SSA railways operate at traffic densities that would constitute minor branch line economics for most developed railways. Only South Africa and Gabon operate much above one million traffic units per line-km per year whereas EU railways operate at levels of four million or greater. Unfortunately, traffic density is one of the most important determinants of rail viability, so SSA railways face a real challenge in reaching viability.

3. A high percentage of the traffic (60-100 per cent) carried by SSA railways is freight because low speeds and poor service along with better road transport have driven away passengers. More significantly, freight traffic has been at best relatively stagnant and has actually decreased for a number of countries, again because of poor service and growing competition.
4. With the exception of South Africa, most SSA railways are quite small. For example, almost all carry less freight traffic than say the railway of Slovenia, so they are all small by European standards.

South Africa's railway is distinct. Transnet Freight Rail's 20,000km of line make it larger than all but SNCF and DB in the EU. Transnet Freight Rail constitutes a true national rail system carrying general commodities as well as mining and industrial commodities. Transnet Freight Rail has several electrified lines and operates at a technical and effectiveness level roughly comparable to that of many developed railways. The averages are a little misleading though: the Sishen to Saldanha and Ermelo to Richard's Bay lines carry about 60 per cent of Transnet Freight Rail's ton per km on only about 7 per cent of its line-km; much of the rest of the system is lightly used and of questionable financial sustainability. In addition, all of the apparent SSA freight traffic growth between 1980 and 2008, is attributable to Spoornet and Transnet Freight Rail. When the South African freight traffic growth is subtracted from the rest of the SSA system, rail freight traffic outside South Africa actually decreased between 1980 and 2008.

Overall, here is the World Bank's conclusion in *World Bank 2010*, page 229:

- Rail networks in Africa are

“ One result of the low line capacity is that the SSA railways operate at traffic densities that would constitute minor branch line economics for most developed railways. ”

disconnected, and many are in poor condition

- Some networks have closed and many others are in relatively poor condition
- As long as the railways are government operated, bureaucratic constraints and lack of commercial incentives will prevent them from competing successfully

The SSA government responses to the railway challenge have generally fallen into one of three types; South African restructuring, concessioning with rehabilitation and inaction.





Source: Henry Posner, Railroad Development Corporation

### CONCESSIONING SSA'S FREIGHT RAILWAYS

The South Africa government created a large holding company, Transnet, which originally owned Spoornet, all the ports and harbours, the national pipeline company and the national airline. In an initial step, Spoornet's passenger services and the airline were transferred to other agencies, which lifted the support burden from the freight railway. Subsequently Transnet has absorbed its component parts so that it is difficult to distinguish the performance of Transnet Freight Rail from the rest of Transnet. The government has conducted a number of restructuring studies of the transport sector, including the railway, and has proposed a large program of infrastructure investment, but detailed plans for the future of freight railways in South Africa are not yet available.

There has been a significant move to concession SSA's freight railways. The following list is by no means exhaustive:

- Sitarail from Cote d'Ivoire to Burkina Faso, initiated in 1995, was quite positive until the disruption caused by civil conflict in Cote d'Ivoire. It has since recovered
- The Togo railway was

- concessioned to CANAC in 1995. The concession was transferred to a joint venture of West African Cement and RITES of India in 2002
- The railway of Zaire (now Democratic Republic of Congo) was concessioned (Sizarail) in 1995, but was terminated in 1997 due to civil conflict, It has been re-concessioned as SNCC
- The Zimbabwe railway was partly concessioned in 1997, but the concession is not now in force.
- Camrail was concessioned from the old Cain Meroon Railway in 1999, as Wasthe Transgabonaise railway concession
- The Central East African Railway was created from the old Malawi Railway in 1999. It now serves traffic in Malawi and Mozambique (Nacala) and is controlled by Mozambican investors
- Transrail (Senegal-Mali) was formed in 2003, as were Madagascar (Madarail) and the National Railway of Zambia (RSZ), RSZ was renationalised in 2012)
- The Beira and Nacala railways in Mozambique were

concessioned in 2005

- The railways of Kenya and Uganda were concessioned in 2006 (Rift Valley)
- Tanzania Railways Corp was concessioned in 2007, but the concession was renationalised in 2010

Success has had to be measured by covering operating costs and some portion of equipment and track maintenance costs.

The concessioning process has certainly not been trouble free. In part, this is because writing and implementing successful concession agreements puts a large burden on governments that have little experience in doing so. It could also be that at least some of the concessionaires may have had objectives other than rail operation in mind. In addition, as figure 1 suggests, many of the SSA railways

are so small and lightly used that there may be no sustainable role for them whether concessioned or not. There were also cases where civil conflict made operations impossible and, of course, weak government and corruption in the SSA economies make all enterprise management a challenge.

Looking at the future of railways in the region, there are several reasons for at least measured optimism.

With this acknowledged, many of the concessions have survived and have done better than the government operators before them. This appears to have been particularly true of concessions that had solid bulk commodities traffic in a period of strong world markets and a combination of government rehabilitation and fair regulatory policy supporting the private operator. Even so, success has had to be measured by covering operating costs and some portion of equipment and track maintenance costs. There have been few if any cases where the concessionaire has been able to engage in any significant degree of asset rehabilitation or major investment, though there are proposals to build entirely new mining railways where traffic will support it.

It is significant, though, that private investment in concessions has almost always been accompanied by a programme of policy reform, often financed by an international development bank. In some cases, development finance has included

both loans to the government for asset rehabilitation and investment in the private concession.

The remaining cases of purely public operation (Democratic Republic of the Congo, Zimbabwe, Namibia) are not encouraging. The future of these railways may well be in question if some form of restructuring or concessioning is not attempted.

#### THE FUTURE: INVESTING IN RAILWAYS & INFRASTRUCTURE

In looking at the future of railways in the region, there are several reasons for at least measured optimism.

First, subject to forces in the world economy that are uncontrollable and unpredictable, many of the SSA economies seem to have turned a corner toward more stable governance and economic development. If so, their railways should benefit accordingly, though many of the benefits seem more likely to accrue to highways and air traffic than railways. There has also been some progress in reducing trade barriers and improving transport connections, though a number of problems remain. Perhaps most importantly, there is now a large body of railway reform experience available, replete with the lessons of success and failure. Countries wishing to pursue the process can find plenty of help and sources such as the Commonwealth Business Council, which can sponsor such assistance. In this regard, the role of Brazilian investors in the movement of coal from Mozambique is particularly interesting as the hard-earned lessons of concessioning and private operation of high-density railways in Brazil are now being transferred.

Aside from the private sector investing in concessions, the role of the government of China may be particularly significant. China has long had an interest in SSA railways, as evidenced by the

building, financing and operation of the Tanzania-Zambia (TAZARA) railway. More recently, driven by a determination to control supplies of basic materials, China has invested, or proposed to invest, in railway infrastructure in Ghana and Nigeria and there are said to be 25 or more current railway projects with potential Asian investors according to *The Economist*, Feb 16, 2013, pg 50-51. It remains to be seen whether the new Asian investments will be accompanied by requirements for restructuring or reform or whether they will focus on assets and political influence.

*Much of this article is based on the author's experience as the World Bank's Railways Adviser from 1987 to 2003. More recent data and experience are based on three excellent World Bank studies: 'Africa's Infrastructure, A Time for Transformation.' (see especially Chapter 11) 2010, and 'Off Track: Sub-Saharan African Railways,' 2009, and 'Africa Infrastructure Country Diagnostic, Railways in Sub-Saharan Africa', June 2009.*

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