13. Transport Services - Rail

For over a century, the history of Ethiopia's railway sector has been closely tied to the Ethio Djibouti Railway Company. This railway is one of the oldest in Africa and played a significant role in Ethiopia's development. Spanning 781 km and linking Addis Ababa with the Port of Djibouti, the 1000mm gauge railway ran for 681 km in Ethiopia and 100 km in Djibouti. Ownership of the narrow-gauge railway has been shared by the governments of the Federal Democratic Republic of Ethiopia and the Republic of Djibouti.

In Ethiopia, the dominant mode of transport, both for passenger and freight has been the road transport. Road transportation is associated with low transport capacity, high transport cost, high energy consumption, and exhaust emissions that pollute the environment. In contrast, electrified railway transport is a green transportation option that offers high transport capacity, reliability, space and energy savings, environmental friendliness, and faster speeds. The land required for railway projects is only about half of that needed for roads, and with electric traction, energy consumption is only a fraction of that used by road transport.

13.1 Ethiopia Railway Corporation and the Standard Gauge Railway

In 2007, a TAG was established under the Ethiopian Ministry of Transport to define a framework for the development of a railway corridor. This included a pre-feasibility study on socio-economic and macro-economic benefits, and a detailed corridor analysis. The TAG recommended the introduction of a railway system throughout Ethiopia as the primary national mass transportation system. The study emphasised the importance of modernisation and expansion of the existing 1m gauge (1,000 mm) railway to a standard gauge (1,435 mm) line to provide faster access to the Port of Djibouti from inland Ethiopia. In the same year, the Council of Ministers established the Ethiopian Railway Corporation (ERC) by regulation No. 141/2007 to develop the railway infrastructure and provide freight and passenger transport services in Ethiopia.

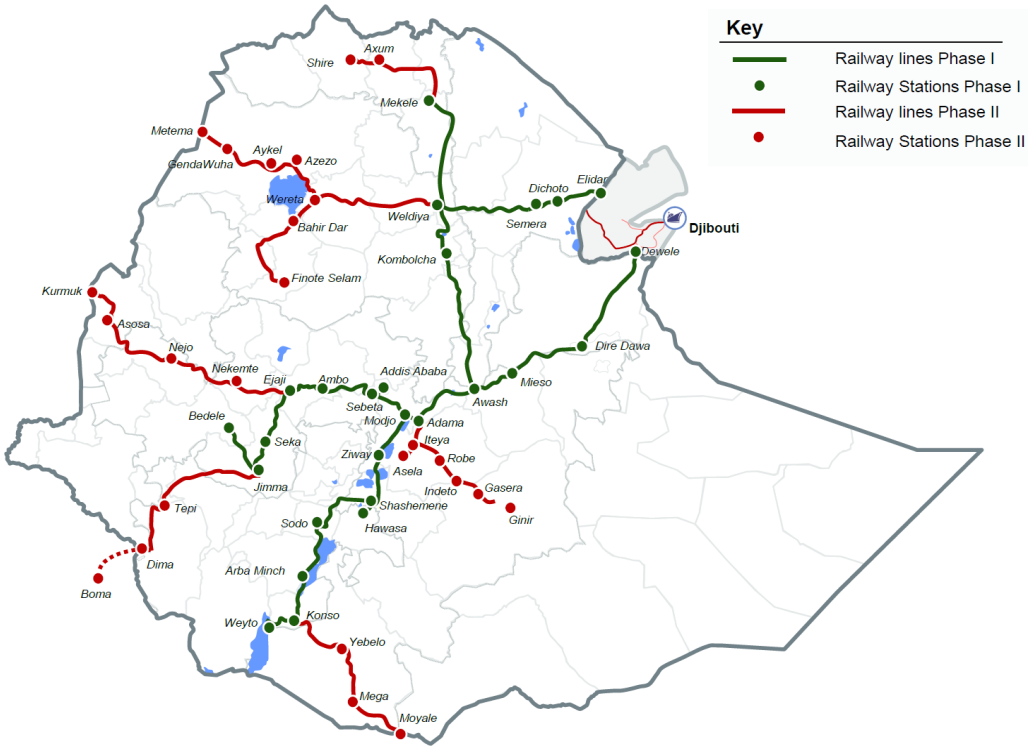
In June 2010, the Transport Ministers of both countries signed an MoU in Djibouti on the Development and Operation of a Standard Gauge Railway Line between Ethiopia and Djibouti. The Ethiopian Government subsequently adopted its five-year Growth and Transformational Plan (GTP) to achieve economic structural transformation and sustainable accelerated growth towards Ethiopia's longer-term vision of being a middle-income country by 2020–2023. The GTP included the development of dry ports, rail and road networks, and air transport. It aimed to develop the standard gauge railway line for Ethiopia and Djibouti and a 34 km light rail system for Addis Ababa as priority projects.

ERC has developed railway alignments on eight corridors in Ethiopia with a total length of about 5,000km and as shown in **Figure 13.1** and listed in **Table 13.1**

Table 13.1: The National Railway Network of Ethiopia in Eight National Corridors

NO	RAILWAY NETWORK ROUTES SELECTED	PHASE	LENGTH (KM)
Route 1	Addis Ababa – Modjo – Awash – Dire Dawa -Djibouti	1	656
Route 2	Mojo–Shashemene-Awasa-Konso-Woyito-Including Konso-Moyale		903
Route 3	Addis Ababa-Ejaji-Jimma-Guraferda-Dima-Directed to Boma		637
Route 4	Ejaji-Nekemet-Asossa-Kummruk		460
Route 5	Awash-Kombolcha-Mekelle-Shire	1	730
Route 6	Fenoteselam-Bahirdar-Wereta-Weldia-Mile- Djibouti		740
Route 7	Wereta-Azezo-Metema		248
Route 8	Addis Ababa-Adama-Indeto-Gasera-Ginir		248

Figure 13.1: Planned National Railway Network of Ethiopia



Source:

ERC's current priority is to construct the first phase of the national railway network, which spans over 2,000 km. To streamline the process, the corridors have been divided into sub-sections. The projects are at varying stages of development, as shown in **Table 13.2**, with some already completed and commercial operation has commenced. Some are in advanced stages of physical construction, and others are still in the feasibility study stage.

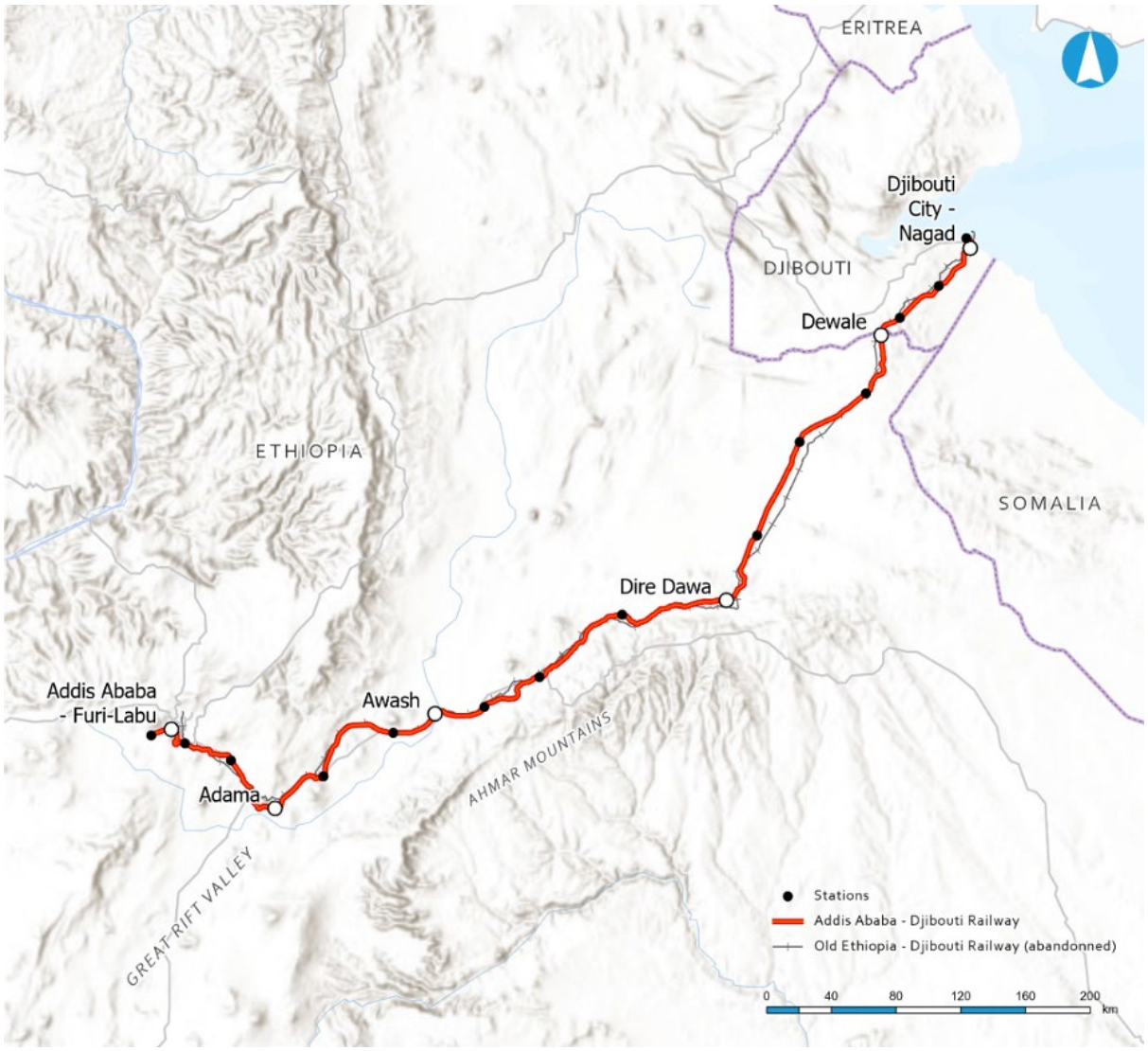
Table 13.2: Implementation status of Railway Infrastructure Projects

	Name of the Project	Status
1	Addis Ababa – Djibouti Railway Project	Completed and in commercial operation
2	Mekelle – Weldya Railway Project	58% physical progress
3	Awash Weldya Railway Project	92% physical progress
4	Asayita – Tadjoura Railway Project	Feasibility study stage
5	Sebeta – Jimma – Bedele	Feasibility study stage
6	Modjo – Moyale Railway Project	Feasibility study stage

13.2 Addis Ababa – Djibouti Railway line

13.2.1 Description of the Line

Figure 13.2: Map of the Addis Ababa to Djibouti Standard Gauge Railway



Source: https://www.gihub.org/connectivity-across-borders/case-studies/addis-ababa-djibouti-railway/

The Addis Ababa–Djibouti Railway Standard Gauge Railway (SGR) is a 753 km electrified single-track standard gauge line between Ethiopia´s capital Addis Ababa and the Port of Djibouti, with 45 stations in total. The SGR runs parallel to, and replaces, the original one-metre gauge railway built more than 100 years ago. However, although the standard-gauge railway follows the route of the old one-metre gauge line, it is built on a new, straighter right-of-way that allows for much higher speeds. New stations have been built outside city centres, and most of the old railway stations have been decommissioned. There are 68 viaducts and bridges and there are no tunnels.

The total length of the railway line is 759 km, of which 754 km run between the two terminal stations at Sebeta and the Port of Doraleh. The remaining five kilometres are for shunting operations. A total of 666 km of the railway line is in Ethiopia, while a total of 93 km is in Djibouti. The 115 km section

from Sebeta to Adama is the only double-track section of the line, and it also has the highest grades with a net elevation loss of 650 meters. It features several viaducts with lengths of up to 800 meters. The remainder of the railway is single-track, with passing loops distributed evenly along its length.

There are 21 dedicated railway stations along the railway and all of them can serve as passing loop stations as they have three tracks or more (except the Adigala station which has only two tracks). Four of the 21 railway stations are designed as passing loops only, so there is no freight loading/unloading or passenger service. Two of the remaining 17 stations are freight yards only and two others are for passengers only. The remaining 13 stations can handle both passenger services as well as freight loading/unloading.

As a landlocked country, the line serves as the main transport corridor for Ethiopia to its gateway of the Port of Djibouti, which handles over 90% of Ethiopia's international trade. The line runs from Addis Ababa/Sebeta through the two large Ethiopian cities of Adama and Dire Dawa and links industrial parks and dry ports.

The railway line is owned by the Ethiopia-Djibouti Railway (EDR), a joint venture company of the two state-owned companies, Ethiopia Railway Corporation (ERC), owning 75 per cent of the railway and La société de chemin de fer Djibouti (SDCF), owning 25 per cent of the railway.

The project was constructed by China Railway Group Limited (CREC) and China Civil Engineering Construction Corporation (CCECC). CREC and CCECC also have a contract to operate the railway for six years following construction completion.

The line was opened for freight in October 2015 and was formally inaugurated for passenger services in October 2016. It became officially commercially operational as of 1st January 2018.

In summary, the Addis Ababa–Djibouti Railway was designed to the Chinese National Railway Class 2 Standard but with some modifications as requested by ERC. It is a Standard Gauge railway, with trains using Jannery AAR couplers and air brakes. Electrification is via a 25kvA 50Hz AC overhead catenary. The target speeds are 120km/h for passenger trains and 80km/h for goods trains. The maximum freight train load is 3,500 ± 93 tonnes and the design capacity is 20 million tonnes annually, with a gross transport capacity of 24.9 million tonnes annually (taking double-track sections into account). The maximum gradient is 1.85 per cent (1 in 54) and the length of arrival and departure track at passing loops is 850 metres (dual locomotive is 880 metres), meaning that the maximum train length is approximately 800 metres.

Although road traffic in Ethiopia drives on the right, trains drive on the left in the double-track sections. This is consistent with Chinese railway practice.

All rolling stock was purchased by ERC and has been transferred to EDR.

13.2.2 Operation of the Addis Ababa – Djibouti Railway line

The railway line is operated by the Ethio-Djibouti Standard Gauge Railway Share Company (EDR), a public joint venture owned by the Governments of Ethiopia and Djibouti. EDR has signed an operations and management contract for six years with the joint venture between China Railway Engineering Corporation (CREC) and China Civil Engineering and Construction Corporation (CCECC).

In April 2017, the Ethio-Djibouti Standard Gauge Railway Share Company (EDR) was established as a result of a Bilateral Agreement signed on 16th December 2016 between the Governments of Ethiopia and Djibouti. The Shareholders' Agreement was signed on 11th January 2017. The Shareholders agreed to establish a share company with an initial share capital of USD500 million, consisting of 10,000 shares of USD50,000.00 each. The purpose of the company is to operate and maintain the

Addis Ababa-Djibouti Standard Gauge Railway Line, including the maintenance and renewal of all of the line infrastructure and equipment, and to operate freight and passenger transport services on the Line.

Since the opening of the railway line, the transport volumes and passenger numbers have been below planned volumes and numbers as shown in **Figure 13.3** and **Figure 13.4.**

Figure 13.3: Tons of cargo transported on the Ethiopia-Djibouti Railway (2018-2022)

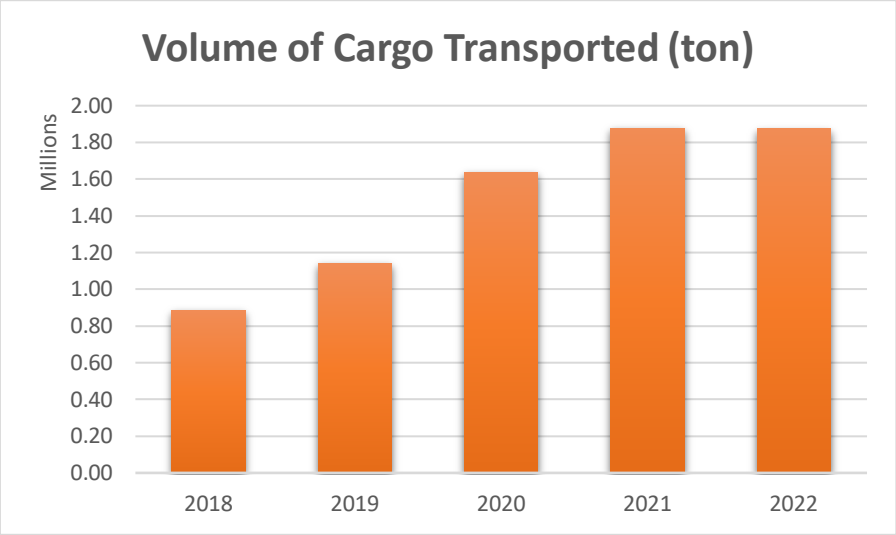


Figure 13.4: Numbers of Passengers transported on the Ethiopia-Djibouti Railway (2018-2022)