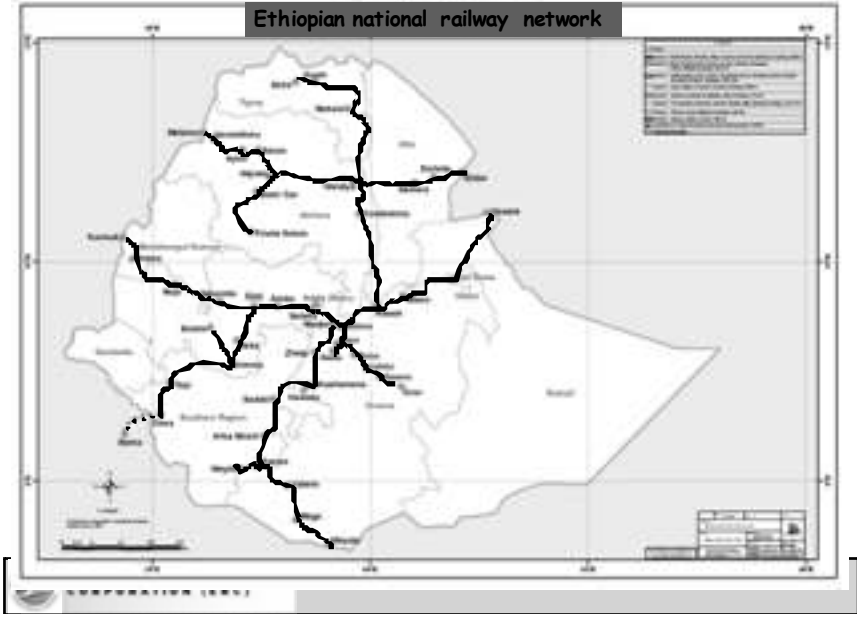
Ethiopian national railway network



Vision for Standard Gauge Railway Development

The selected National Railway Network have been surveyed (500 m band) using the latest technology that found in the world i.e **Airborne Laser Scanning Technology (3-D Object Mapping)** using **Li**ght **D**etection **a**nd **R**anging (LiDAR) technology.

From the survey huge volume of spatial data has been collected including:

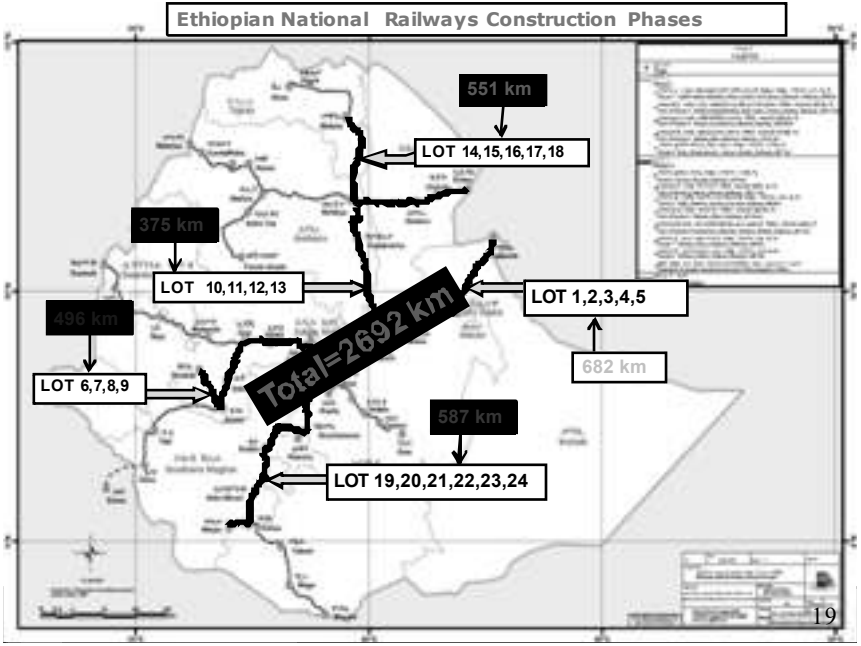
- Aerial Photo,
- Ortho Photo,
- Digital Terrain Model,
- Digital Surface Model,
- Contour data,
- Other vector data (line map).

Vision for Standard Gauge Railway Development

Five Year National Growth and Transformation Plan (GTP) would enable the nation to double the agricultural products and the general economic growth by registering 14.9 percent growth on average.

- Facilitate for the industry sector to take the lead in the over all development activities in the country.
- Expanding and ensuring quality health and education services towards meeting MDGs targets in the sectors.
- Register fast and sustainable economic growth in which the industry sector would play significant role.
- Benefits of youth and women have also been the targets by enhancing capacity building and good governance issues.
- Ensure food security at household and national level.
- Intensify efforts to address hurdles of investment flow by expanding infrastructure facilities.
- Due attention for the development of train, road, telecommunication, power, irrigation, potable water and sanitation sectors.
- **More than 2,000 km of railway networks would be constructed.**
- Generate 8,000 to 10,000 MW from water and wind resources.

Thus, Railway construction in different parts of the country is one of the major activities that the GTP gives due attention.


Ethiopian National Railways Construction Phases
551 km
LOT 14,15,16,17,18
375 km
LOT 10,11,12,13
LOT 1,2,3,4,5
496 km
682 km
Total=2692 km
LOT 6,7,8,9
587 km
LOT 19,20,21,22,23,24

Market Demand Characteristics

Passenger demand Forecast

Year	2007	2009	2015	2018	2020	2025	2030
Estimated passenger (in Billion) @CARG 2.5%	1.95	2.04	2.30	2.44	2.53	2.90	3.09

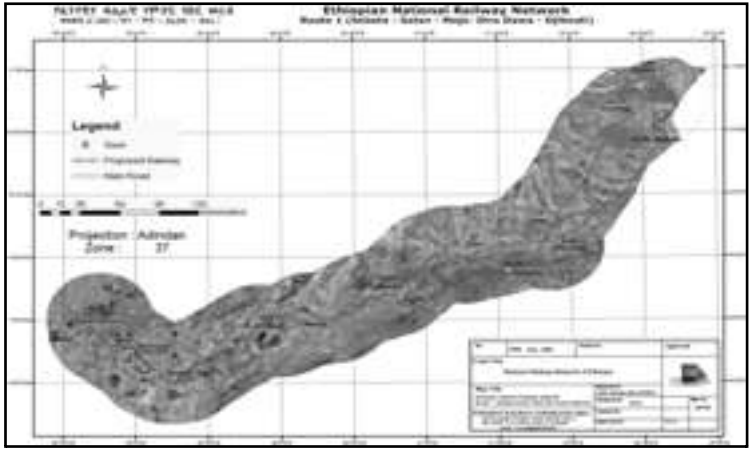
Freight demand Forecast

Year	2010	2012	2014	2018	2020	2025	2030	2034
Estimated Freight potential(Million tons)	5.100	5.84	6.44	7.841	8.615	11.010	14.00	17.09

Project Description: Addis Ababa – Djibouti Railway

Technical Design of Project

Plan of Addis Ababa - Djibouti and the main centres of population which will be served along line.



Technical Design of Project

Route 1 - Salient Features and Technical Specification

TRACK	
Track Length	Circa 780 Km (To be finalized in Detailed Design)
Gauge	1,435 mm
Passing loops	*3-km long at = 30km intervals approximately or at stations (Subject to capacity assessment and performance modelling)
Rail section	UIC 54 or 60 kg rails CWR on concrete sleepers at 60 cm spacing
Turnouts and Passing loops	Suitable for 100 kph in the loop line
Alignment	Where possible, construct as open route (ie in cutting/ embankment, on bridges/viaducts as much as possible). Where tunnels are required, these to be as short as possible.
Formation Width	*Double Track or Single Track (Suitable for Future Double Track)
Horizontal curvature	> 2,000 meters minimum (in urban areas and approaching developed cities, lower radii can be permitted).
Ruling gradient	<1.0% (In exceptional conditions 2% maximum gradient will be permitted to minimize extent of cut/fill + tunnelling works),
Maximum passenger train speeds	160 kph (with future provision for 225 kph operation)
Maximum freight train speeds	120 Kph
Permanent speed restrictions	<10% of the route mileage
Axle loading	25 Tonnes Maximum
Structure Gauge	UIC Compatible
Track Drainage	Pipe with Filter Material or Open Channel (Finalise With AAU/Other Railway Operators Where Risk of "Flash Flooding").

Technical Design of Project

Route 1 - Salient Features and Technical Specification

ELECTRIFICATION	
Traction supply	25 KV 50 Hz via Overhead Line Equipment – See Typical Section
Sub-stations supply	From two separate sources
ROLLING STOCK	
Passenger rolling stock	EMU and Locomotive hauled passenger trains
Mainline locomotives	6,000 HP Electric Traction
Freight rolling stock	100 Tonnes gross weight with flats. Examine option for double stacking containers. Freight train length 775m
Maintenance locomotives	2,500 HP Diesel Electric Traction (Can be used for project construction train operations, initial revenue earning services and perturbations recovery).
Shunting locomotives	1,000 HP Diesel Hydraulic Traction or similar
Braking System	Dual Air Pipe (Operation and Fail Safe) or similar
Coupling Type	"Buck Eye" or similar automatic type.
SIGNALS AND COMMUNICATION	
Signalling	Fixed block + Lineside Signals + In Cab Technology.(Moving Block signalling option to be assessed).
Communication	GSM-R or similar fibre optic based. Fixed + mobile telephones.
Train control	CTC, ATC, ATS, remotely controlled points machines