

# STANDARD GAUGE RAILWAY (SGR) DEVELOPMENT

**BEARTICE AKUN**

**ARTE-SGR  
KENYA RAILWAYS**

**November 17, 2016**



KENYA  
VISION 2030

| From a Great Past to a Greater Future



# CONTENTS

1. About Kenya Railways
2. Background;
3. Technical Characteristics;
4. SGR route;
5. Progress Made;
6. Expected Benefits of the Project.

# About KR

- The Kenya Railways is a Parastatal under the Ministry of Transport, Infrastructure, Housing & Urban Development.
- The Corporation was established by an Act of Parliament (Cap 397) of the Laws of Kenya, and commenced operations on January 20, 1978.
- The overall mandate of the Corporation then was to provide a coordinated and integrated system within Kenya of rail and inland waterways transport services and inland port facilities.

# About KR

- The Act was amended through The Kenya Railways (Amendment) Act 2005 to make it possible for the Board of Directors to enter into concession agreements or other forms of management for the provision of rail transport services.
- Following this Amendment, KR conceded railway operations to Rift Valley Railways Ltd (K) from November 1, 2006 for 25 years for freight services and 5 years for passenger.

# About KR

- **Our Vision**

To be the preferred provider of premium rail transport services.

- **Our Mission Statement**

To provide a customer focused, efficient and sustainable rail transport system.



| From a Great Past to a Greater Future



# About KR: Our Core Values

- **Customer Focus:** We are continuously committed to achieving the highest level of customer satisfaction through the improvement of our services, innovation and technology.
- **Integrity:** We are guided by probity and highest business ethics in carrying out our business.
- **Professional Excellence:** We seek high standards of management, service delivery and professionalism to ensure efficient, effective and high quality standards of service.
- **Team work:** Together we will remain focused on delivering our objectives.

## About KR: Mandate

- To provide skills and technology for the railway sector
- To provide efficient and effective railway services
- To leverage our assets to grow business
- To promote, facilitate and participate in national and metropolitan railway network development

# About KR: Responsibilities

- Supervising concession
- Operation of Nairobi Commuter Rail
- Developing Standard Gauge Railways
- **Facility Management and Development**
  - ✓ Land and Housing Estates
  - ✓ Relocation Action Plan (Mukuru and Kibera)
  - ✓ Kenrail Towers management
- The Railway Training Institute
- Inland waters operations
- Nairobi Railway Museum

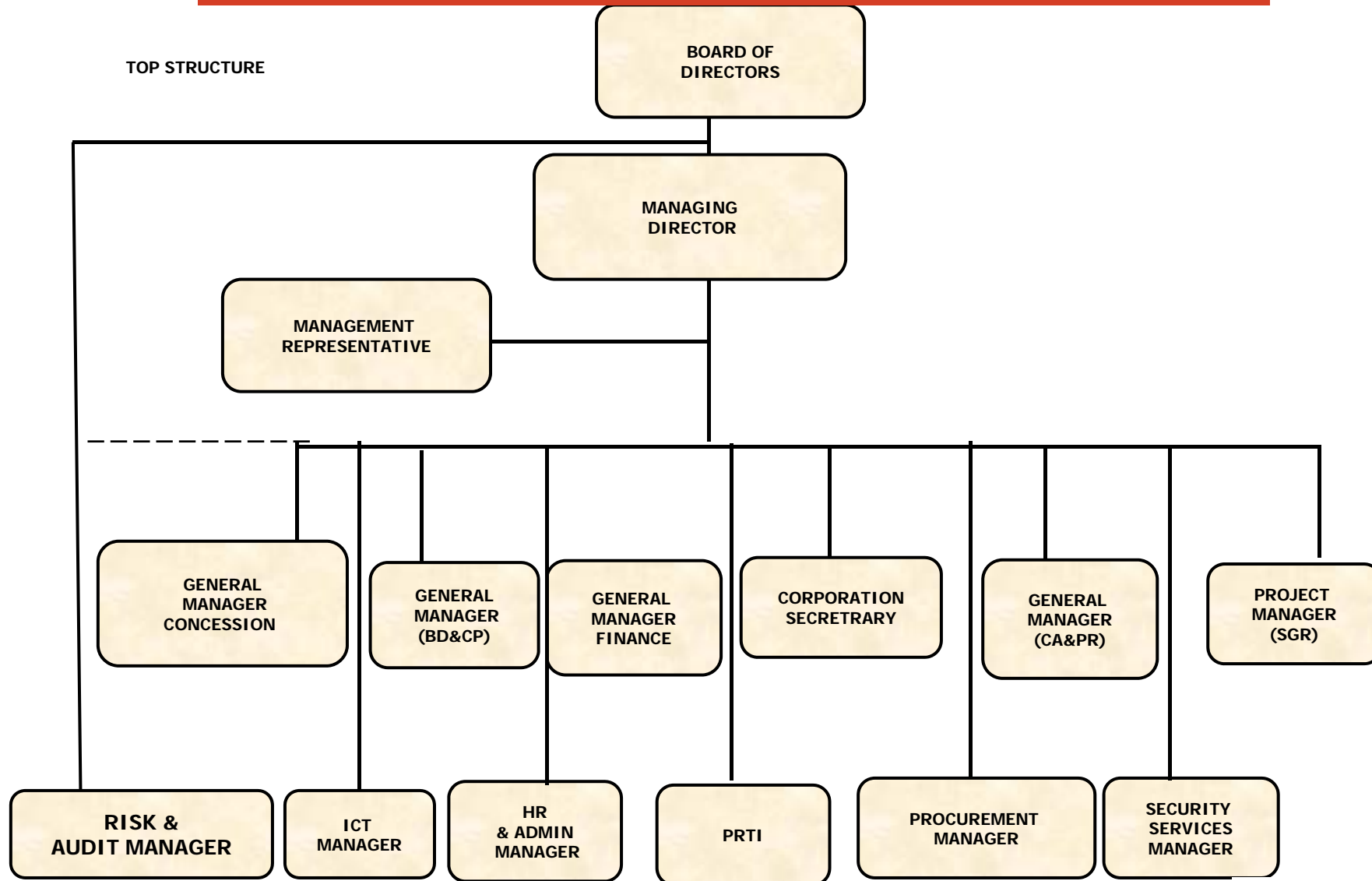


From a Great Past to a Greater Future





# About Kenya Railways – Our People



# About Kenya Railways – The Key Drivers



Gen.(Rtd.) Jeremiah M. Kianga,  
EGH, CBS

**Board Chairman**



Mr. Atanas K. Maina

**Managing Director**



| From a Great Past to a Greater Future



# BACKGROUND

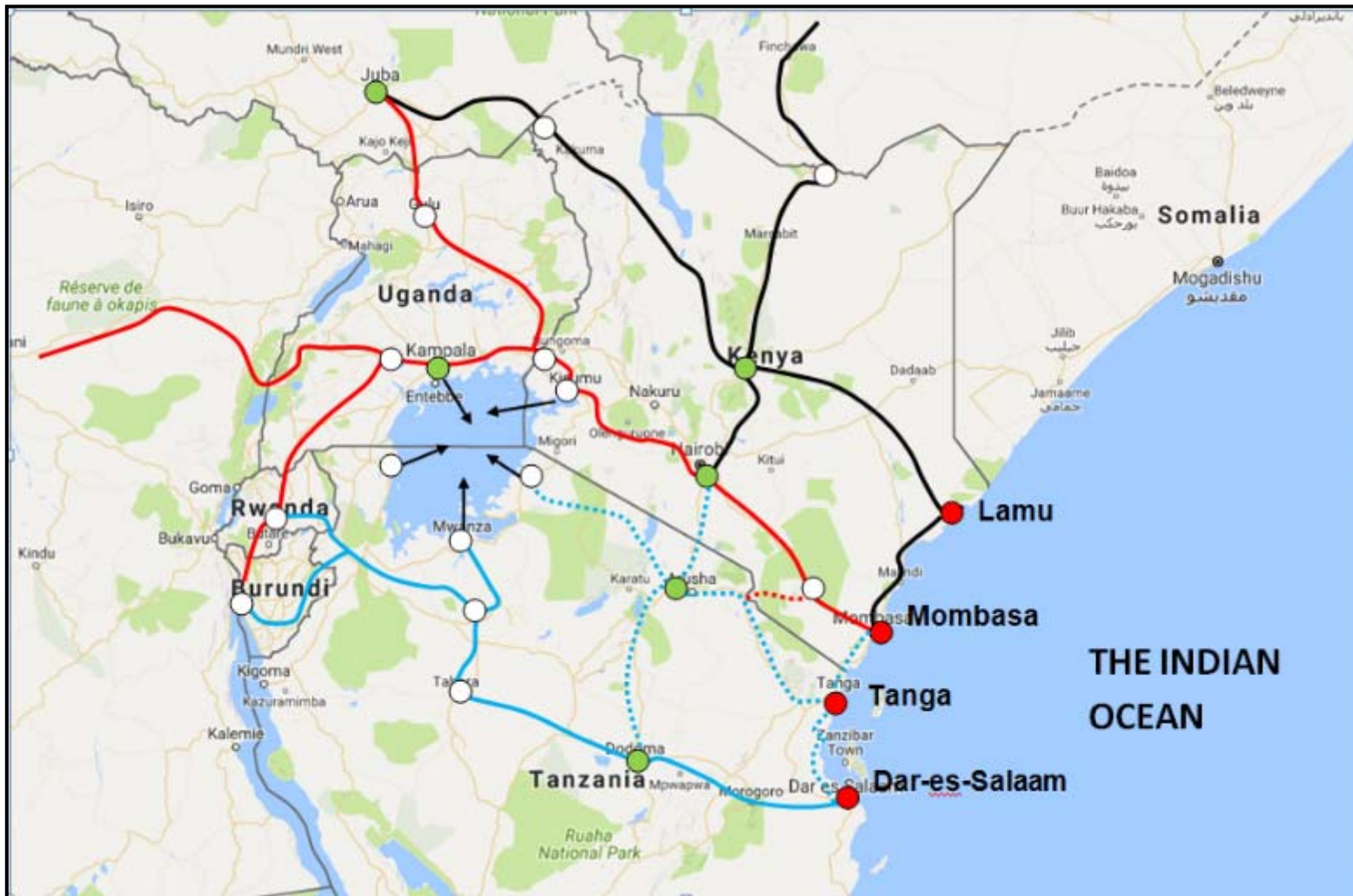
## Existing Metre Gauge Railway

- Obsolete technology;
- Low speeds;
- Low payload (short trains);

East African Community has developed the East Africa Railway Master Plan adopting standard gauge railway technology.

Each country to develop network within its borders.

# The EA SG Railways Master plan



# Mombasa – Malaba/Kisumu SGR Development

- ❖ **Phase 1: Mombasa - Nairobi;**
- ❖ **Phase 2: Nairobi – Kisumu – Malaba**
  - ❖ Phase 2A: Nairobi – Naivasha
  - ❖ Phase 2B: Naivasha – Kisumu (including new high capacity port at Kisumu)
  - ❖ Phase 2C: Kisumu – Malaba via Yala and Mumias
- Phase 1 financed through a loan from EXIM Bank (90%) of China and the Railway Development Levy Fund (10%);
- Phase 2A financing identified from GoK and EXIM Bank of China (15% : 85%)

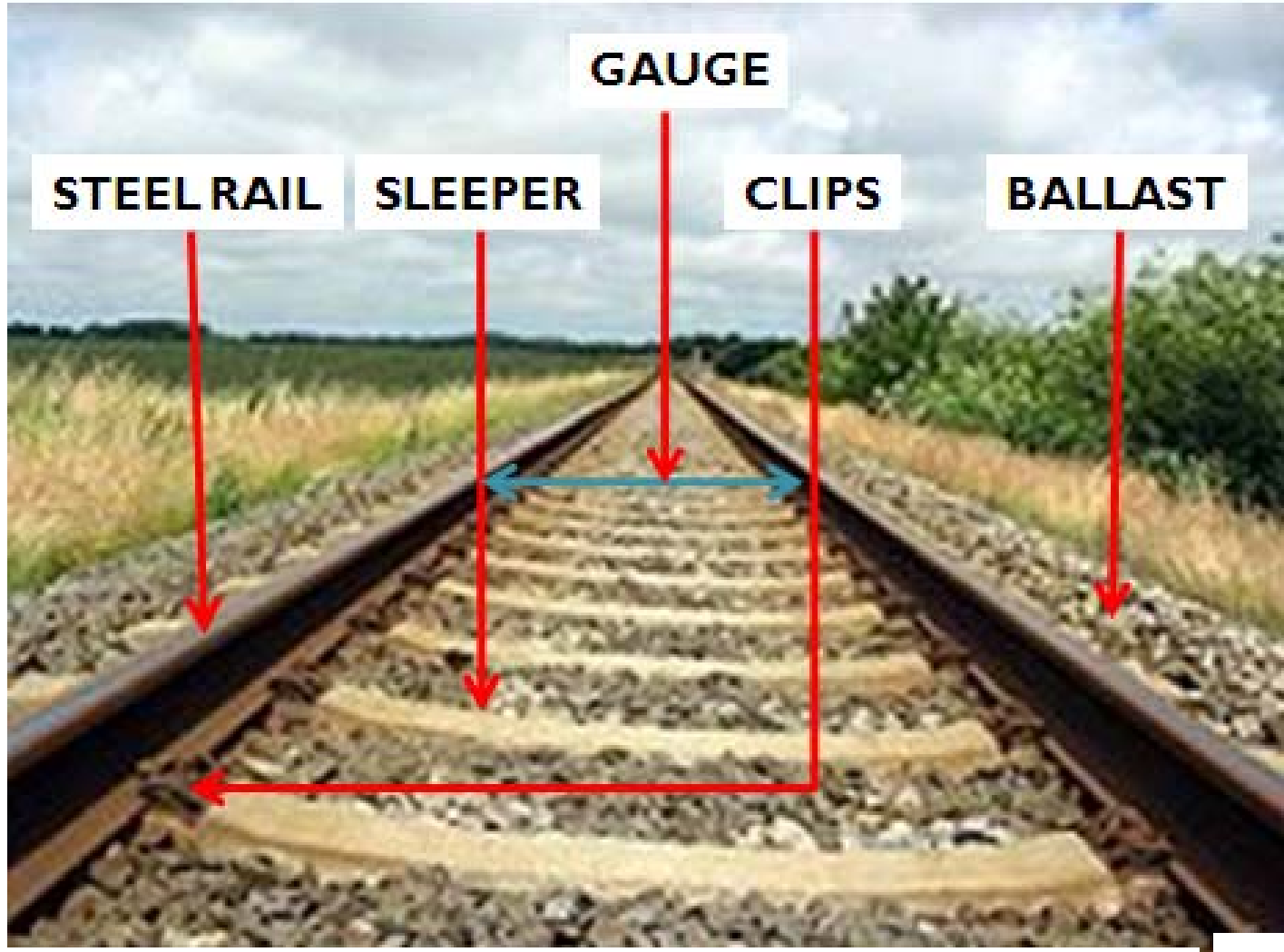
## Phase 1 financing and other details

- EPC contractor - China Road and Bridge Corporation
- Supervision Consultant: TSDI/APEC/EDON Consortium
- Financing:
  - i. Civil Works EPC Turnkey Commercial Contract for KShs. 220,921,502,221
  - ii. Supply and installation of Facilities, Locomotives and Rolling Stock contract for US \$ 1,146,791,008.75
  - iii. Supervision: US \$ 41,184,638.

# TECHNICAL CHARACTERISTICS OF THE SGR TRACK



# Components of a Railway Track



# Technical Characteristics of the SGR Track

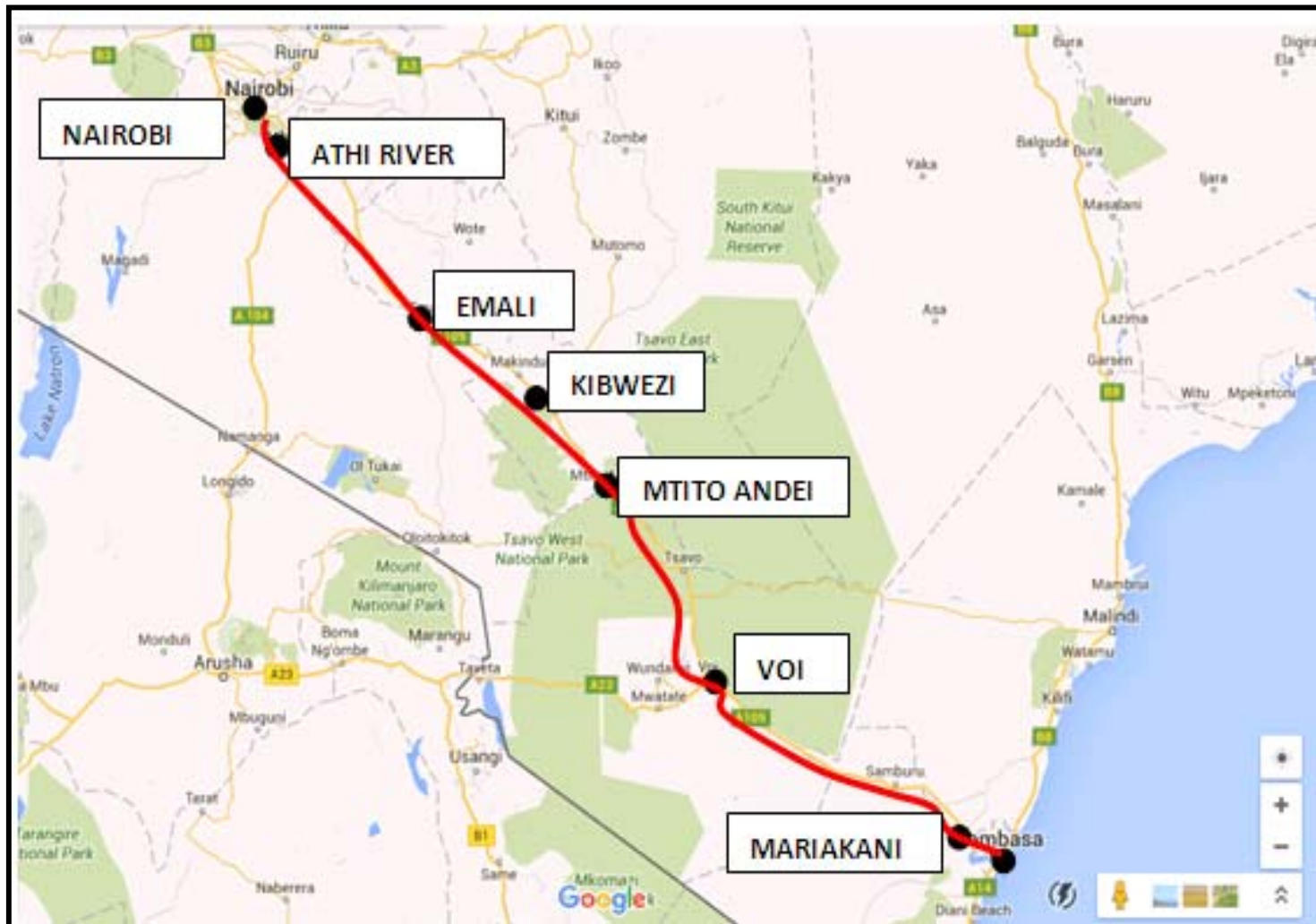
Item	Specification SGR	Specification MGR
Class of Railway	Class 1 More Stable	Class 3
Gauge	1,435 mm (broad)	1,000 mm (narrow)
Crossing loops	880 metres (long trains)	590 metres (short trains)
Minimum Radius	1,200 m (suitable for high capacity, high speeds)	175 metres (low capacity, low speeds)
Speeds	Passengers = 120 kph Freight = 80 kph	Low speeds
Maximum gradient	1.2% (suitable for heavy haulage)	1.5% (2% difficult sections) - light haulage
Container loading	Double stack 216 TEUs per train	Single stack 34 TEUs per train
Axle loads	25 tonnes plus 10%	16 tonnes
Power Type	Diesel initially; designed for future electrification	Diesel (no plans for electrification)
Power of Locomotives	Passenger: 3,850 KW (5,000 HP); Freight: 3,850 KW (5,000 HP) Shunting: 1,800 KW (2,400 HP)	2,000 KW (2,600 HP) passengers and freight

# Technical Characteristics of the SGR Track

Item	Specification SGR
Animal Corridors	Provision of underpasses at least 7.2 m high by 72 m wide
Track	Mainline 60 Kg/m, type II shouldered pre-stressed concrete sleepers, 500 mm ballast depth
Flood Frequency for bridges and culverts	1 / 100 year flood
Subgrade	7.7m wide and surface slope of 4%; Subgrade basecourse of mainline is 2.5 m thick – 0.6 m thick for surface with 1.9 m for the base course
Min. Width of Sub-grade Shoulder	Embankment-0.8 m; Cutting-0.6 m
Turnouts	60 Kg/m I:12 with concrete sleepers
Structure Gauge	6.86 m plus 700 mm height for electrification

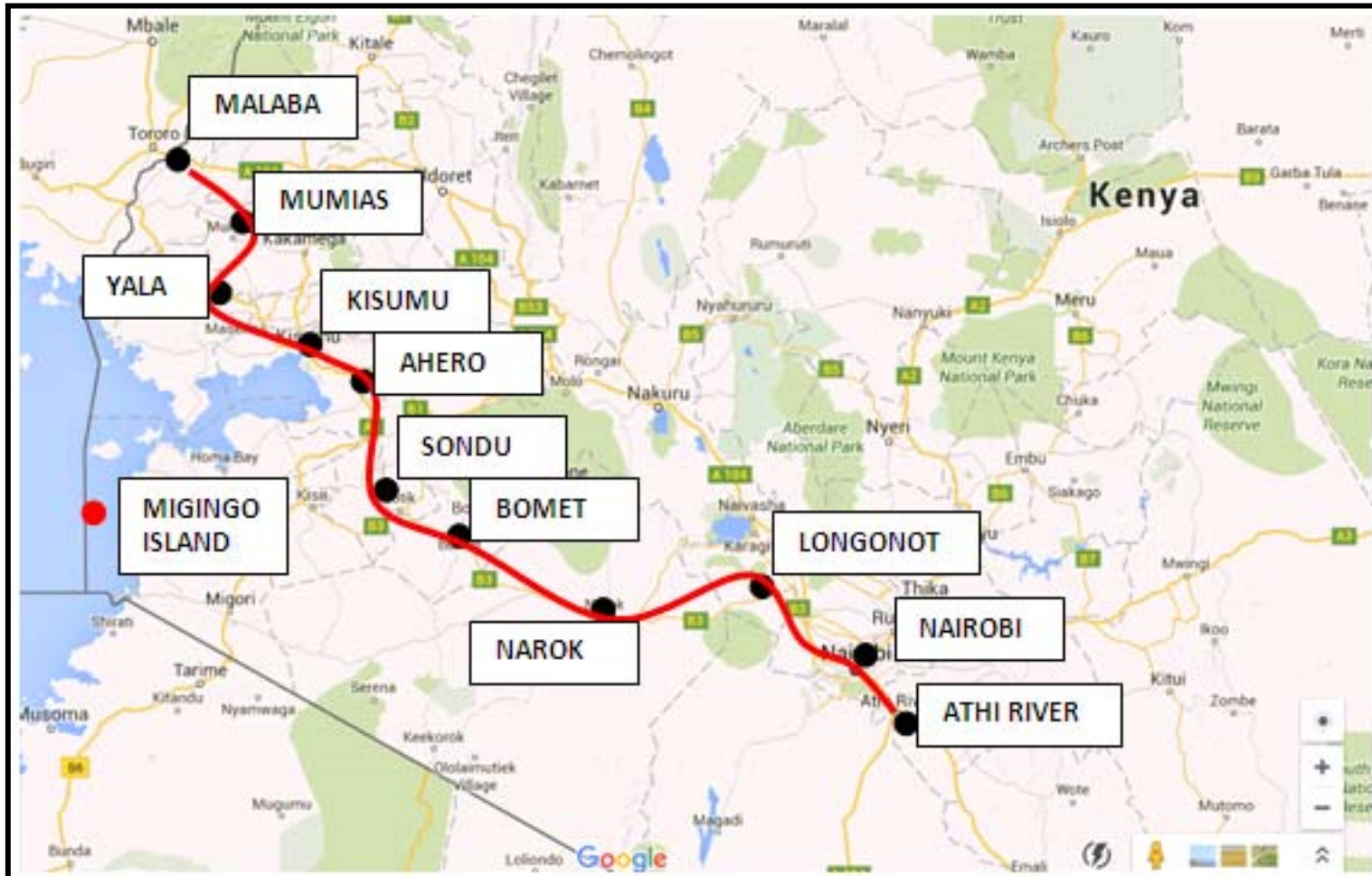
# SGR ROUTE

# Mombasa – Nairobi SGR at construction stage



● Proposed passenger stations

## Nairobi – Malaba SGR: Construction launched 19-10-16



● Proposed passenger stations

# SGR Mombasa-Nairobi Route

- Route length – 472 Km (Total track length – 616.65 Km);
- Two major freight stations: Mombasa Port and Nairobi South Hub;
- Two main passenger stations Nairobi South Hub and Mombasa West;
- Seven Intermediate passenger stations: Mariakani, Miasenyi (Bachuma Gate), Voi, Mtito Andei, Kibwezi, Emali and Athi River;
- 23 No. crossing stations.
- Main maintenance depots at Mombasa & Nairobi.

# Section of SGR Route in MOMBASA & Mombasa County: DK 0 - 8.5

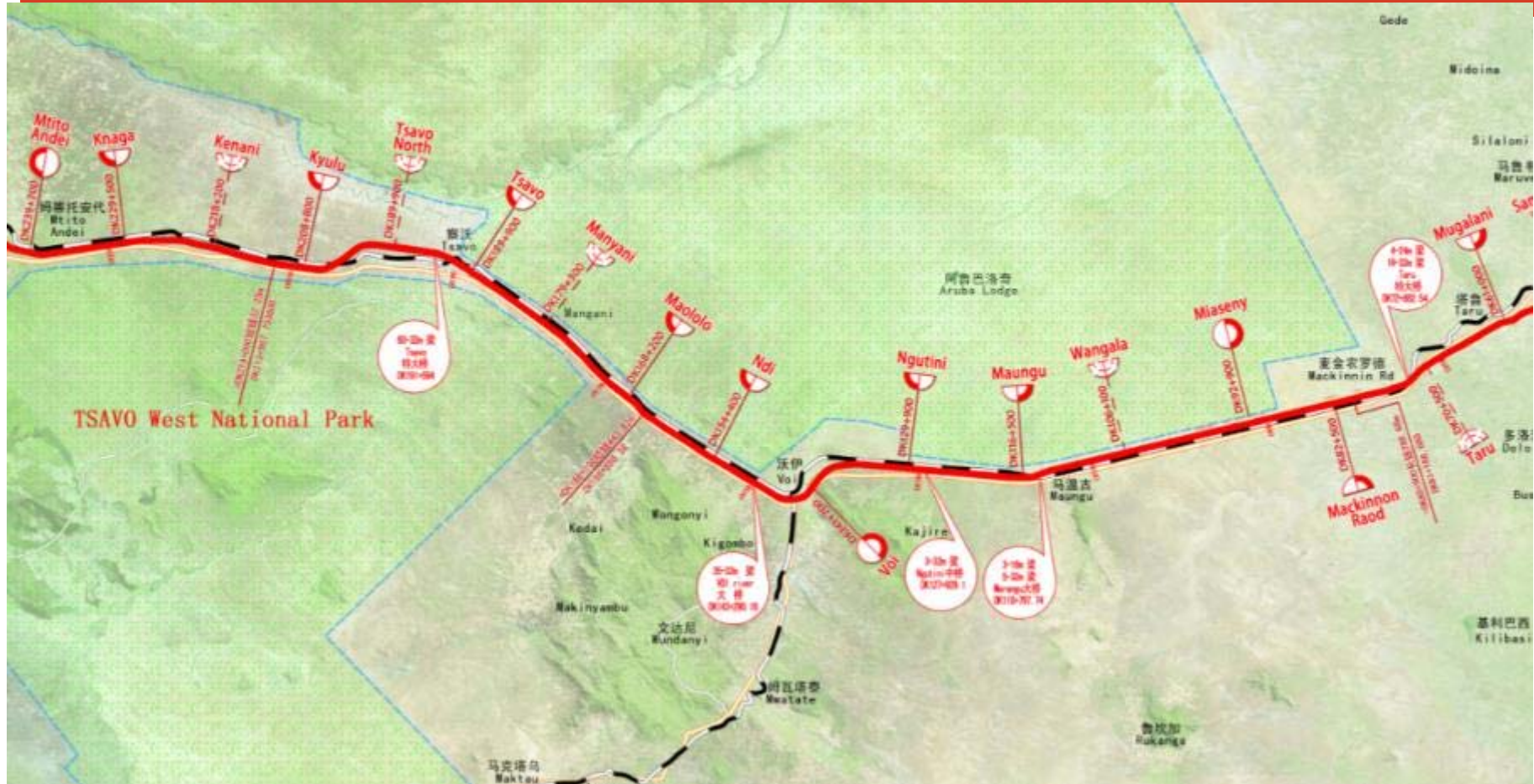




# Section of SGR Route in MOMBASA & Kwale County: Chigate to Taru



# Taita Taveta County: Mackinnon Road to Tsavo



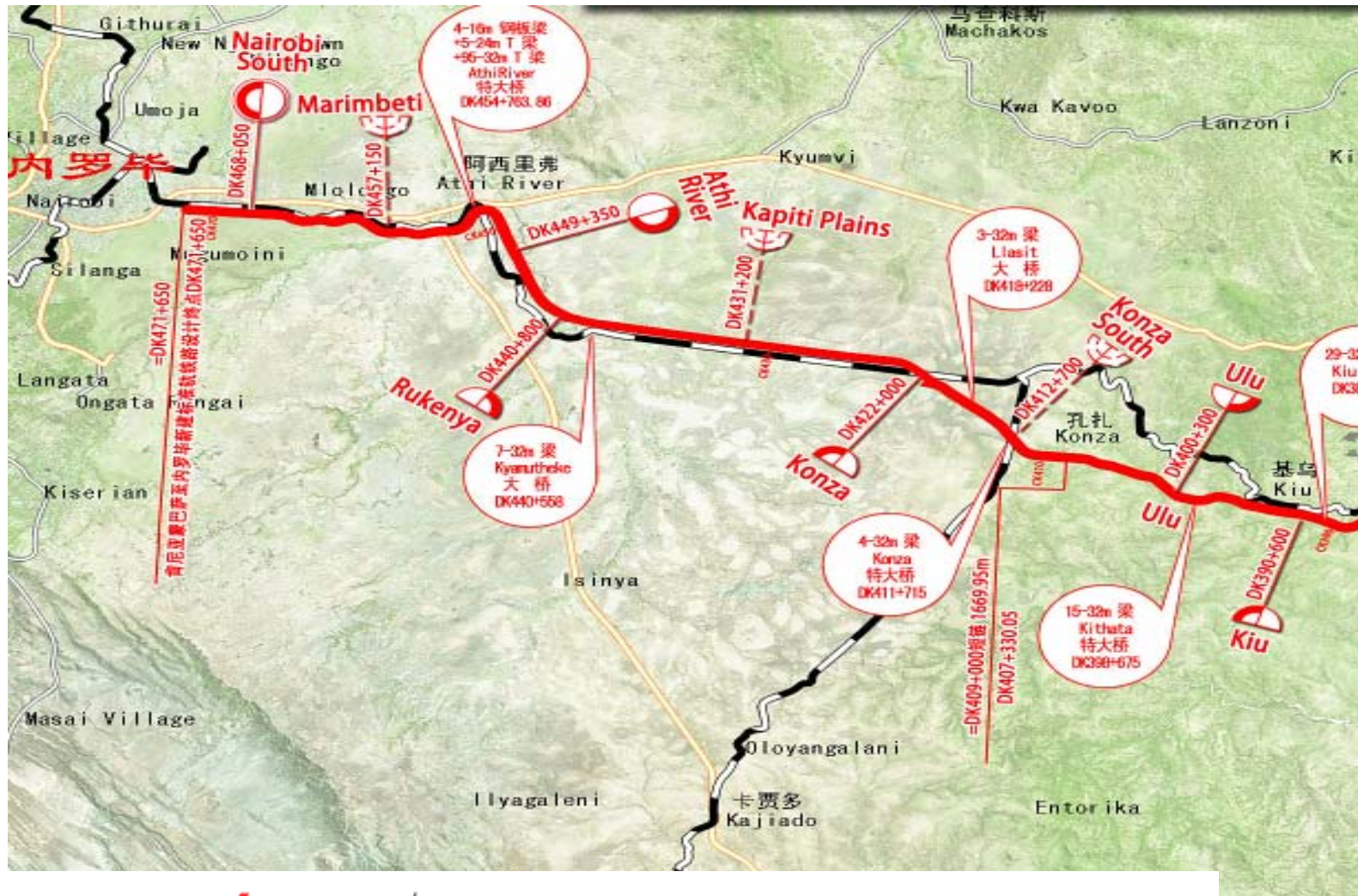
# Section of SGR Route in Makueni County: Mtito Andei to Kiboko



# Section of the SGR Route in Kajiado County: Kiboko to Konza

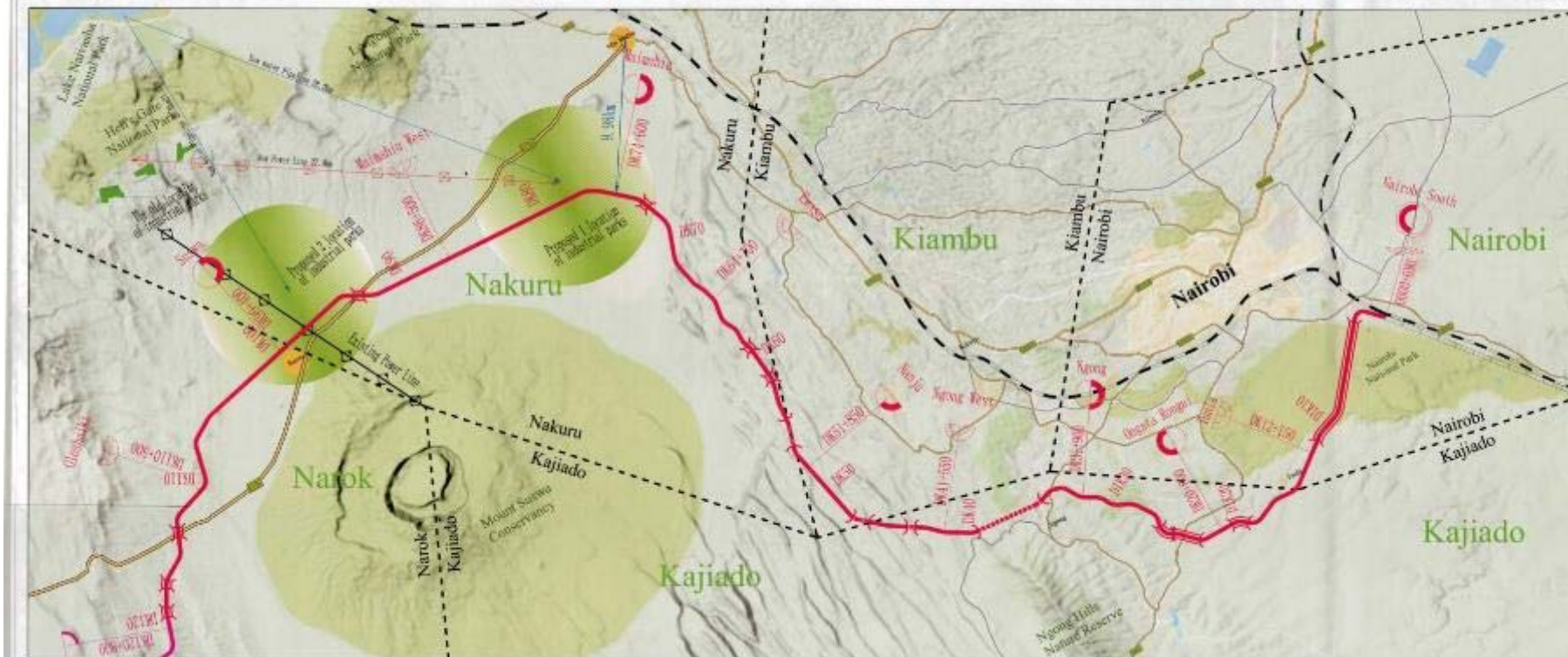


# Section of the Route in Machakos County: Konza to Mlolongo



# SGR PHASE 2A ROUTE

Nairobi - Naivasha Standard Gauge Railway Project Schematic Plan



# PROGRESS MADE

# SGR Implementation of the Works

P1: Rvetment of Port Reitz Station of Section 1 (15 Sep 2016)



P2: Mackinnon Road Main Building of Section 2 (19 Sep. 2016, DK82+200)





# SGR Implementation of the Works



P3: Side slope protection of Section 3 (29 Aug 2016, DK251+500)



# SGR Implementation of the Works



P5: Athi River Station of Section 5 (21 Sep 2016)



P6: Completion of Track Laying of Section 6 (17 Sep, 2016 DMK5+052)

# SGR Implementation of the Works



P7: Testing of track of Section 7 (23 Sep, 2016 DK352+000)



P8: Structural Steel of Rolling Stock Depot of Section 8 (10 Sep 2016 Nairobi South)

# SGR Implementation of the Works



P9: Substation Installation of Section 9 (25 August, 2016 DK348)



P10: Feeder of Base station No.21 of Section 11 (11 Sep, 2016 DK234)

# Progress of Implementation: Works

- **Contract 1:** Progress of civil works as of 30<sup>th</sup> October 2016 is 98%
- Construction of earthworks (subgrade) nearing completion (99.95%);
- Pile foundations and open excavations for bridge abutment and pier foundation completed (100%);
- Construction of culverts and underpasses nearing completion (99.64%), track laying 83.79%;
- Works utilize pre-cast T-beams and pre-stressed concrete sleepers – pre-casting processes completed at Mtito Andei and Emali;
- Construction of stations is ongoing.
- **Contract 2:** CSE is at 54%

# Progress of Implementation: Works

S/N	ITEM	UNIT	TOTAL QTTN	CUMULATIVE QTTN	% OF CUMULATIVE AGAINST TOTAL
1	SUBGRADE	KM	445.67	445.67	99.95%
2	PILE FOUNDATION	No.	3249.00	3249	100.00%
3	SPREAD FOUNDATION	No.	271	271	100.00%
4	BEARING PLATFORM	No.	624	624	100.00%
5	PIER	No.	895	895	100.00%
6	CULVERT	No.	562	560	99.64%
7	BEAM (32m)	Pcs	1504	1504	100.00%
8	BEAM (24m)	Pcs	68	68	100.00%
9	BEAM (16m)	Pcs	44	44	100.00%
10	SLEEPER	No.	1055582	1077160	102.05%
11	TRACK PANEL ASSEMBLY	KM	586.91	585	99.67%
12	TRACK LAYING	KM	606.91	549.186	90.49%

# Progress of Implementation: Works

S/N	ITEM	UNIT	TOTAL QUANTITIES	CUMULATIVE QUANTITIES	% OF CUMULATIVE AGAINST TOTAL QUANTITIES
13	T BEAM ERECTION	Span	808	808	100.00%
14	STATION CONSTRUCTION	M <sup>2</sup>	190728.99	167068.92	85.25%
15	POWER SUPPLY CABLE	KM	460	457.023	99.35%
16	STATION POWER SUPPLY	Sataion	33	24	72.73%
17	SUBSTATION	No.	14	12	85.71%
18	TRINK FIBRE OPTIC	KM	1098	931.4	84.83%
19	STATION FACILITY INSTALLATION	Sataion	33	1	3.03%
20	BASE STATION FACILITY INSTALLATION	No.	54	30	55.56%
21	COMMUNICATION CABLE	KM	746.278	599.212	74.93%
22	COMMUNICATION FACILITY INSTALLATION	Sataion	37	32	86.49%

## Other Related Works

- Development of port relief lines to service the berths.;
- Expansion and upgrade of the Inland Container Depot (ICD). The works will comprise of:
  - i. Additional railway tracks;
  - ii. Access roads to facilitate evacuation of load;
  - iii. ICD yard to loading and stacking of containers.
- Progress at ICD  $\approx$  40%



# EXPECTED BENEFITS OF THE PROJECT

## Expected Benefits (Short Term)

- Provided employment – about 19,400 (85.7% out of overall staffing of 22,629 are locals; created over 12,000 indirect jobs;
- Over 840 local suppliers and service providers;
- Over 200 local sub-contractors;
- Contributed to the economy – by end of April 2016, contractor had paid out 55 billion;
- Capacity Building & Technology Transfer;
- Townships along the SGR route have revived – accommodation, supply of footstuff.

## Expected Benefits (long-Term)

- Reduced cost of transportation thus making the region attractive for investment ;
- Reduced environmental degradation through reduced carbon emissions;
- Act as a catalyst for industrialization and economic & social development;
- Contribute to an annual GDP growth of at least 1.5% during construction and operation phases;
- Enhance the Country's & Regions competitiveness;
- Reduce congestion at the Port of Mombasa thus ensuring that it is the preferred Port of choice in the region;
- Reduce wear and tear on the roads leading to reduced maintenance costs;
- Enhance freight security.

**GOD BLESS YOU  
THANK YOU**