

Vision 2063 Africa Integrated High Speed Railway Network (AIHSRN)

EXECUTIVE SUMMARY

PREAMBLE

The **Africa integrated High Speed Railway Network (AIHSRN)** is one of the flagship projects of **Agenda 2063**. Its vision is to interconnect African countries with passenger “high speed” railway network connectivity.

However, in view of the **Africa Continental Free Trade Agreement (AfCFTA)**, the need to broaden the vision to support this economic and trade “grand design” is evident and opportunistic. Therefore, the proposed integrated continental railway network master plans presented below integrate different speeds to enable the network to be of “mixed-use” (i.e. **passenger and freight**). It combines passenger train-only high speed links (up to 320 km/h) like those recently built in Morocco, semi high speed (up to 120km/h for freight and 240 km/h for passenger) links for both passenger and freight trains, and conventional rail links (up to 120 km/h).

MASTER PLANS

To achieve the aspiration of an integrated Africa, politically united, and based on the ideals of Pan-Africanism (i.e. Aspiration-2) and trading amongst African countries and with the rest of the world, the two sequential Master Plans (i.e. Master Plans 2033 and 2043) below are recommended by the African Union to be implemented.

Objectives of AIHSRN – The Integrated Continental Railway Network

The long-term mandate of the integrated continental railway network is to facilitate economic and physical integration of the continent. Thus, there are four main objectives that the AIHSRN should endeavour to fulfil in the long term, as follows:

1. **Connect landlocked countries to seaports** → To provide landlocked countries with rail access to the sea, multi-country initiatives and investments are needed.
2. **Provide interconnections between different regions/parts of African continent** → For continent-wide integration of railways to be a reality, there is a need for connecting the different regions of Africa.
3. **Establish “Trans-Africa beltways”, similar to Trans African Highways (TAH)** → They will fill transport infrastructure gaps in key transport corridors.
4. **Connect all political and economic capitals** → For economic and physical integration of the continent, the network needs to serve all political and economic nodes.



MASTER PLAN 2033 aims to meet the first three objectives:

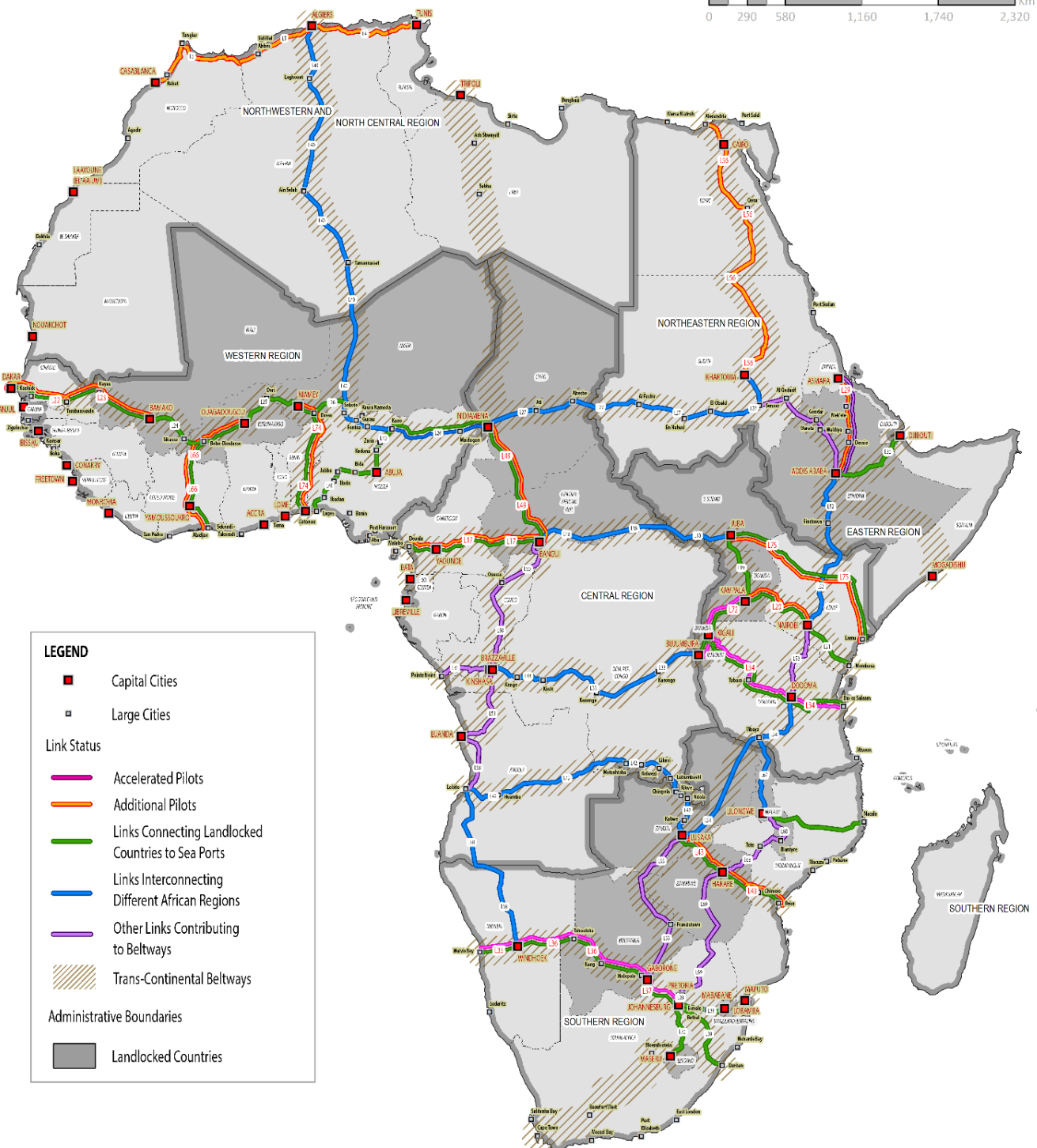
1. Connect landlocked countries to sea ports
2. Provide interconnections between different regions/parts of African continent
3. Establish “Trans-Africa beltways”, similar to Trans African Highways (TAH).

CPCS Solutions for growing economies

AIHSRN Links at the End of 2033

PROCUREMENT OF CONSULTANCY SERVICES FOR THE DETAILED SCOPING STUDY (DSS) - OF VISION 2063 AFRICA INTEGRATED HIGH-SPEED RAILWAY NETWORK AND MASTER PLAN

0 290 580 1,160 1,740 2,320 Km





PILOT PROJECTS

Of the links selected for the Master Plan 2033, two are selected as “accelerated pilot projects” and 11 as “additional” pilot projects.

Accelerated Pilots

No.	Project	Countries Involved	REC Ownership
1	Dar es Salaam-Kigali combined with Kampala-Bujumbura	Burundi, Rwanda, Tanzania, Uganda	COMESA, EAC, ECCAS, IGAD, SADC
2	Johannesburg-Gaborone-Windhoek-Walvis Bay	Botswana, Namibia, South Africa	SADC

Additional Pilots

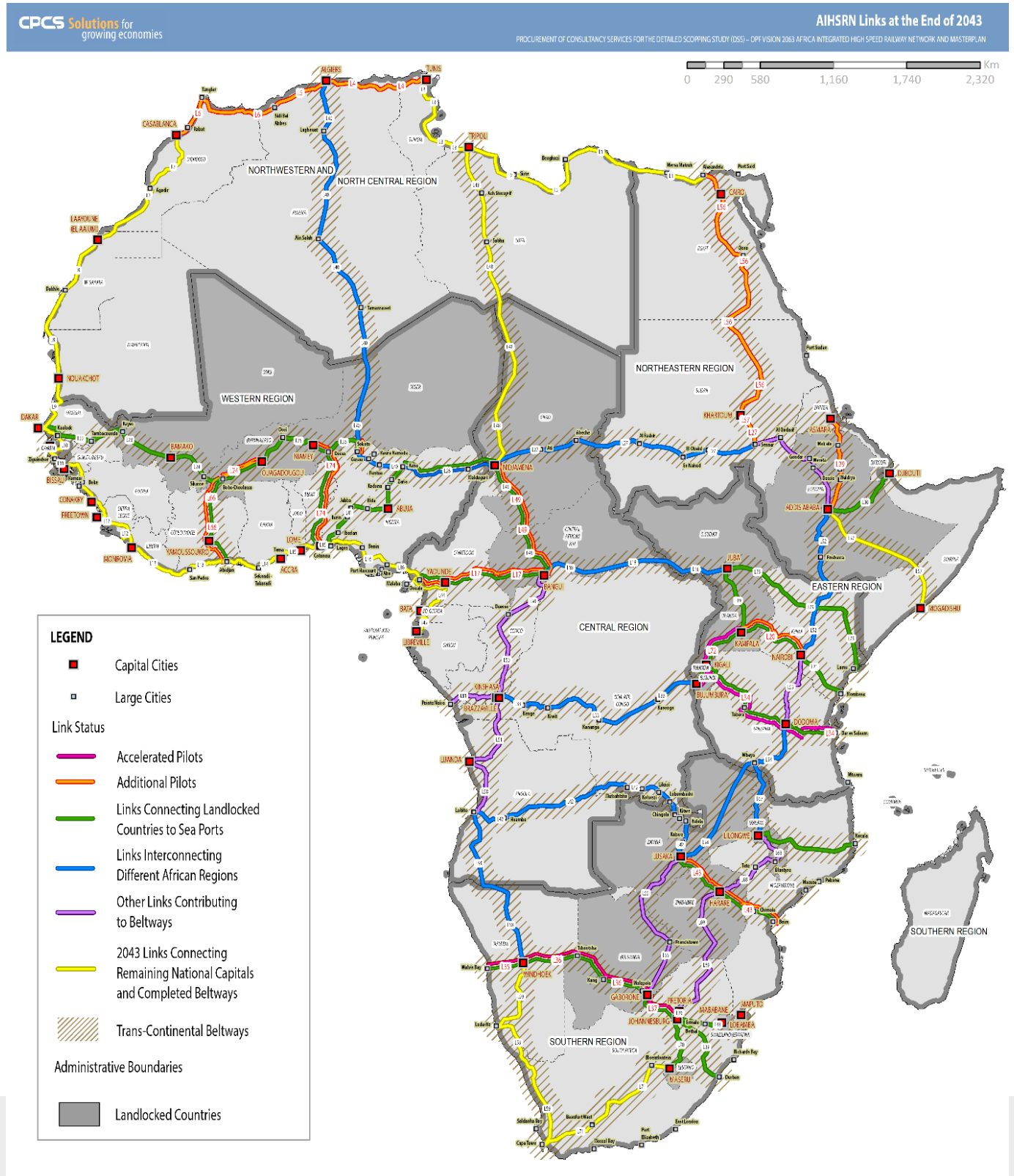
No.	Project	Countries Involved	REC Ownership
1	Nairobi-Kampala	Kenya, Uganda	COMESA, EAC, IGAD
2	Abidjan-Ouagadougou	Burkina Faso, Ivory Coast	CEN-SAD, ECOWAS
3	Tunis-Algiers-Sidi Bel Abbes-Casablanca	Algeria, Morocco, Tunisia	UMA, COMESA, CEN-SAD
4	Cotonou-Niamey	Benin, Niger	CEN-SAD, ECOWAS
5	Alexandria-Khartoum	Egypt, Sudan	COMESA, CEN-SAD, IGAD
6	Addis Ababa-Asmara	Eretria, Ethiopia	COMESA, CEN-SAD, IGAD
7	Beira-Lusaka	Mozambique, Zambia, Zimbabwe	COMESA, SADC
8	Douala-Bangui	Cameroon, Central African Republic	CEN-SAD, ECCS
9	N'Djamena-Bangui	Chad, Central African Republic	CEN-SAD, ECCS
10	Dakar- Bamako	Mali, Senegal	CEN-SAD, ECOWAS
11	Lamu-Juba	Kenya, South Sudan	COMESA, EAC, IGAD

These links are to be supported for implementation by Member States – following its approval by the Specialized Technical Committee (STC) on Transport, on 24 November 2019, in Cairo, Egypt. The African Union Commission (AUC) and the African Union Development Agency (AUDA-NEPAD) are tasked to rapidly advance their implementation through consultation with, and support to, respective Member States.

For the accelerated pilot projects, the Terms of Reference (TOR) for engaging consultants for full feasibility study and draft multinational cooperation agreements for the involved countries have been prepared.



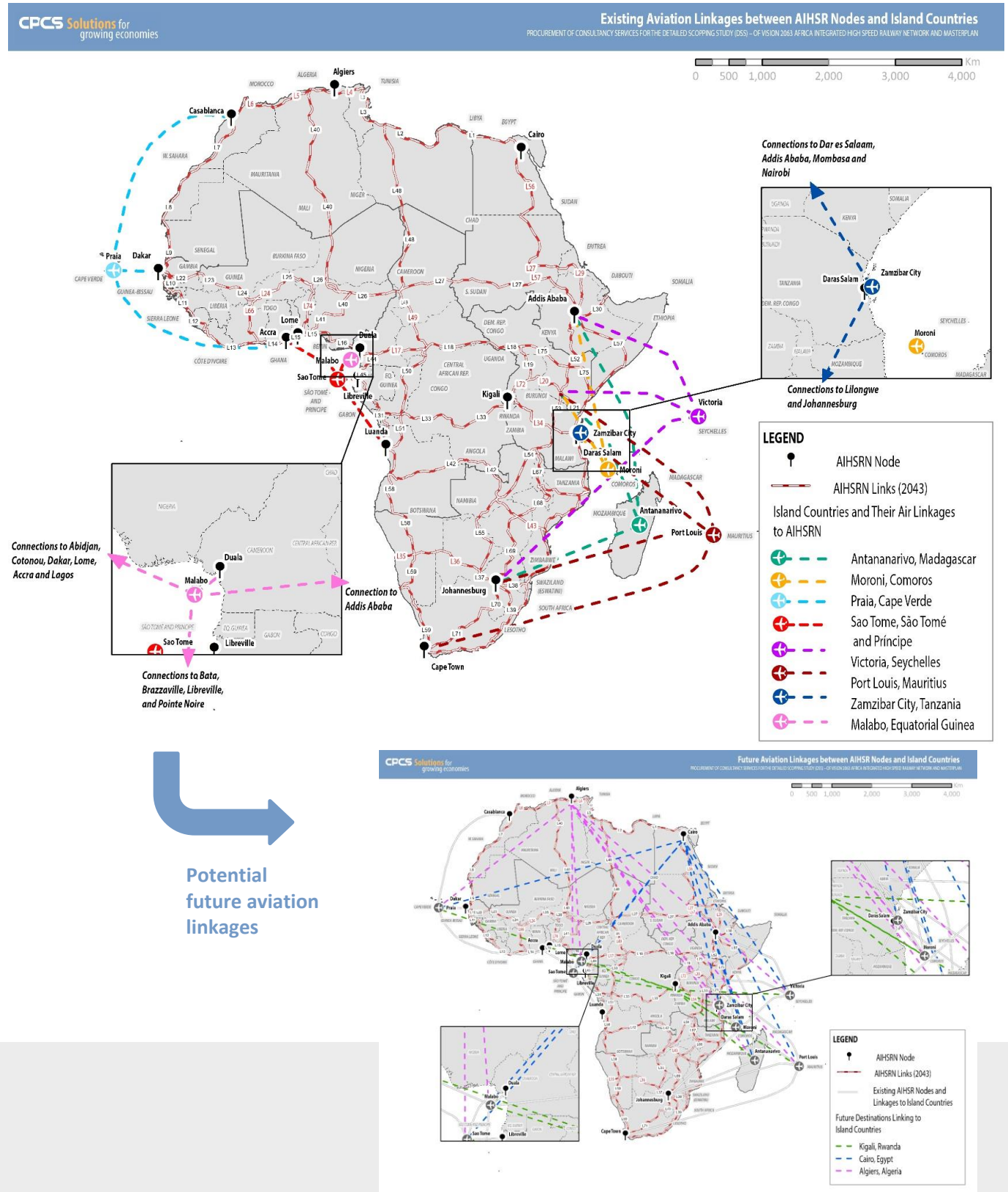
MASTER PLAN 2043 aims to meet the fourth objective, which is to connect all political and economic capitals.





ISLAND COUNTRIES

To build an integrated land and air connectivity, existing and future aviation hubs for the development of grand intermodal (airport-railway) terminals have been identified, as per the map below.





TARGET TRAFFIC AND SPEED

TARGET TRAFFIC

The main objective of the integrated continental railway network is to facilitate economic and physical integration of the continent. This will include passenger and freight traffic unless they are technically or economically not feasible in certain corridors or regions.

Three key categories of traffic may therefore become target markets for AIHSRN, namely:

- High speed passenger traffic
- Long-distance container traffic
- Long-distance conventional freight traffic.

SPEED

Design (or maximum operating) speeds should be set in accordance with the intended purpose of the rail links as well as the terrain they traverse. It is therefore recommended classifying the rail links according to the intended purpose, and setting design speeds accordingly (i.e. the integrated continental railway network to be a mixed-use hybrid network), as follows:

- Category A: High speed, passenger trains only (Speed up to 320 km/h or 330 km/h)
- Category B: Semi high speed, mix of passenger and freight trains (Speed up to 240 km/h for passenger service and up to 120 km/h for freight)
- Category C: Mainly or only freight trains (Speed up to 120 km/h).

STANDARDS FOR INTEROPERABILITY

COMMON STANDARD FOR INTEROPERABILITY

Operation of the integrated continental railway network should be unconstrained across the entire continent without any national or technical barriers. It should, where reasonably possible, also be compatible with existing railway networks and thus be able to extend its area of influence.

It, therefore, will be necessary to develop a minimum set of common standards that are essential for interoperability across the entire network and to be applied on all lines without any modification. The key areas for standardization include track gauge, axle load, structure gauge/kinematic envelope, signalling, control & communication systems, traction/electrification, overhead line and pantograph, couplers, and brakes.

Track gauge is the only parameter that must in no case be deviated from. The other parameters are theoretically modifiable, following consultations with regional (RECs) and continental stakeholders (AUC/AUDA-NEPAD). Their modification, however, should be supported by a technical rationale.

STANDARD GAUGE is the clear recommendation for AIHSRN. **The only possible exception is rail lines in the Southern African Development Community (SADC) region given the scale and performance of the cape gauge network in the region.** In the event that an exception is made in SADC, it should be made with the stipulations that newly constructed lines be:

- Operated as cape gauge only temporarily with the ultimate goal being operation as standard gauge; and/or
- Built as dual gauge track for operation of both meter and standard gauge trains.

In the case of temporary cape gauge operation, it is recommended that the track be constructed as “gauge convertible”.





ELECTRIFICATION OPERATION

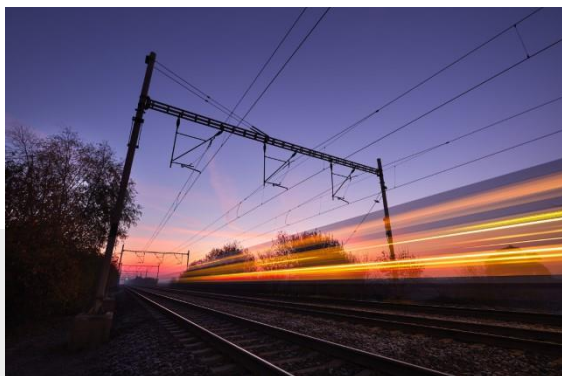
ELECTRIFICATION should be considered as an option for all the lines of the integrated continental railway network, and decisions should be made for each line using a financial cost-benefit analysis.

Relative to diesel operation, electrification has high capital costs with lower annual operating costs. As such, significant revenues are needed to justify the additional investment for electrification.

As a principle, provisions for electrification should be made even if lines are intended to be diesel operated for an indefinite period. Provision, however, may be limited to elements that are expensive to retrofit. In particular:

- A strip of land should be set aside along alignments to later accommodate cables and poles and may already be constructed as part of the track substructure (particularly embankments and cuttings).
- Cable ducts and pole foundations should be included or their retrofit be prepared on bridges and viaducts.
- Sufficient clearance above the track under bridges and in tunnels.

It may also be prudent to reserve land and building rights for intake and traction substations.



EFFICIENT AND EFFECTIVE OPERATION of the integrated continental railway network will require the following to be addressed at the **continental level**:

Infrastructure, Operation and Safety Regulations

There is a need for a common set of operating rules and regulations, which, once agreed, can be implemented by national legislation of respective states. There are a number of ways to do this, from simply coordinating among relevant states (AU taking the lead role), to creating a continental authority.

Origin-Destination Way Billing

It will be necessary for shippers to bill a freight shipment from origin to destination regardless of their locations in Africa, and they should be able to do this with a single waybill and a single tariff.

Seamless Flow at International Borders, Including Free Flow of Wagons

Rail operations at international borders can become a capacity pinch point and add significantly to transit times and costs if proper processes are not in place. The most critical requirement is that wagons are able to flow across international borders regardless of ownership. The second critical requirement is that trains not be unduly delayed due to customs clearance. The most effective way to meet these requirements is to have a single operator on both sides of the border as they would be most motivated and best able to assure efficient operations at the borders, possibly having even locomotives and train crews operating on both sides of the border.

However, a single operator is not an absolute requirement to have efficient flow of wagons across borders. **Interoperable technical standards as well as regulations in place governing customs clearance and rail wagon management would help assure efficient exchange of rail wagons at border posts.**

Minimising Delay for Passenger Trains at International Borders

For the integrated continental railway network to be attractive for international passengers, it is important that measures to minimise transit time is considered. The development of the network should consider including one-stop border posts (OSBPs) for passenger trains. An OSBP aims at reducing transit and processing times between two countries by providing all border control processes from both countries at one location. OSBP promotes a coordinated and integrated approach to the movement of people and improvement of security.



FINANCING

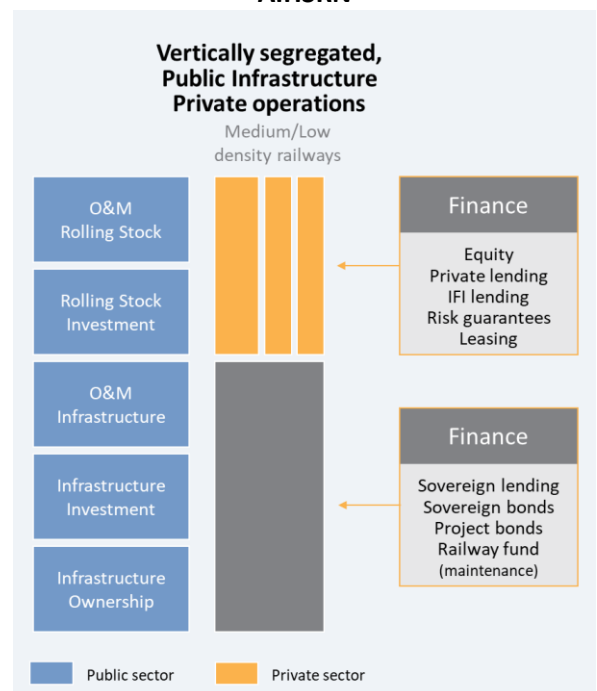
IT IS CRITICAL to mobilise private domestic and international investors and funders alongside donors, International Financing Institutions (IFIs) and public funders in order to crowd in financing through innovative blending of public investment support and private finance.

Innovative blended finance schemes need adequate project structuring, integrating credible commercial and technical assumptions, as well as sensible and acceptable risk allocation. In that respect, and based on the initial economic and financial assessment of the pilot projects, a **vertically segregated structure with the government owning and developing the infrastructure while the private sector takes charge of rolling stock financing and operations**, as shown on the graphics on the right, is recommended.

Among the financial tools that should be advanced to maximise the availability of private finance for AIHSRN is the co-mobilisation of international and domestic funds that can be invested in infrastructure, including domestic pension funds to the extent possible. Regional and international investors, including pension funds from more developed economies (including South Africa), infrastructure funds (often backed by multilaterals), and multilateral and national development banks are increasingly investing in African infrastructure. The issuance and listing of “infrastructure

bonds” in some countries can be replicated in the rest of the continent, and domestic pension funds could co-finance with their own government and with other institutions that are investing in African infrastructure.

Recommended Financing Policy Options for AIHSRN



IMPLEMENTATION FRAMEWORK

AIHSRN MASTER PLAN 2033 is a key pillar of Agenda 2063 First Ten-Year Implementation Plan. To give high-level ownership and direction of its implementation at the national level, **the pilot projects/links of Master Plan 2033 are recommended to be implemented through the AUDA-NEPAD Heads of State & Government Orientation Committee (HSGOC) processes, in particular, through its Presidential Infrastructure Championing Initiative (PICl) platform.**

Given the multiplicity of priority links to be piloted in the first 10 years and beyond (to 2033, and to 2043), **other AU championing initiatives, such as the "High Representative" (HR) framework for infrastructure development in Africa, would complement the PICl process, to ensure all HSR pilot projects are implemented/constructed by 2033.**

TARGET TIMEFRAME: FIRST 10-YEAR

IMPLEMENTATION PLAN: 2014-2023/25

- Completion of Preliminary Design and Feasibility Assessment Study complete for two accelerated pilots by December 2021 and the 11 additional pilots by December 2023.
- Implementation of National Readiness Strategy in seven countries of the two accelerated pilots by December 2022 and the countries of the additional pilots by December 2023.
- Construction of the first kilometer of the two accelerated pilots by December 2024 and the 11 additional pilots by December 2025.



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