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Draft National Rail Master Plan

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Preface

Introduction

The last three years have witnessed the most fundamental shift in South Africa's rail positioning since the South Africa Act of 1909, which established the Union of South Africa and unified the railway system. In 1910, railways formed a major economic cornerstone of our nation. Railways' income was significant, equalling three-quarters of Government Services, translating into more than 4% of GDP. It employed more than 1% of the country's population and handled all long-distance passenger travel. Today, rail turnover represents less than 0.1% of GDP, with similar negligible contributions to national employment and passenger journeys.

To redress the declining role of rail, this draft National Rail Masterplan (NRMP) for South Africa represents a departure from plans that tries to address specific business or agencies to focus on rail as a development tool for our nation. Transnet's recent integrated planning framework is business focussed, compared to the aim of the NRMP to reposition rail as a national asset serving broader economic and social goals, rather than that of a commercial freight enterprise. Similarly, Passenger Rail Agency of South Africa (PRASA) is trying to revive an Agency, which is great, this NRMP must assist us in mobilising the public at large, affordably and safely. While new logistics imperatives might limit rail's previous dominance, rehabilitation and the adoption of new rail products and technologies can ensure not only survival, but a thriving sector that can serve our needs. South Africa's railway must serve the country holistically in viable rail market spaces: supporting economic growth through value chain development, enabling efficient supply chains, and facilitating passenger transport.

This preface defines and examines rail's role within this framework, traces the evolution of South African rail policy from its Union-era origins to recent reforms, and outlines a vision for transforming the railway from a company-centric model to a system aligned with developmental state objectives. Subsequently, the state of South Africa's railway is described against this context and, finally, a call is extended for inputs from a broad range of stakeholders to transform the NRMP into a comprehensive tool for the country.

The Evolution of Rail Policy in South Africa

South Africa's economy is a development state economy, and the railway can and should play an important developmental role. The rail system must ensure export competitiveness and lower logistics cost, whilst at the same time assist with domestic industrialisation and the cost effective and affordable mobilisation of the workforce.

The South African economy due to its location on the periphery of major trade routes, needs supply chain input costs to be as low as possible, even more so than economies situated closer to major trade routes and higher economic density. South African trade competes with several global peers and thus it needs to develop the appropriate supply chain and network strategies to make trade and manufacturing competitive in global markets. Rail transport is one element within the logistics process, co-operating with warehousing, handling terminals, other transport modes and information systems and the NRMP describes how rail can support relevant South African supply chains. South Africa's domestic trade routes are also quite long. In fact, the total domestic transport cost of trade in South Africa is more than the maritime cost to reach foreign ports or receive from foreign ports. As a comparison France and Germany's total land area is comparable to South Africa, but the two countries' combined GDP nearly 20 times bigger. South Africa's spatial challenges are profound, but long hinterland corridors also mean that there is an important role for rail.

The Role of Rail

Rail enables the efficient movement of both goods and people throughout economic systems. Within supply chains, rail's fundamental purpose is to leverage its unique technological advantages at appropriate points where it provides optimal value. Success requires strategic integration, complementing other transportation modes for freight movement rather than operating in isolation and serving as either the complete solution or a critical segment of passengers' journeys from origin to destination.
Figure 1 illustrates six foundational elements that must be present and balanced for an effective rail system: an economic need for the railway (i.e. demand), fully-functioning physical components to effectively run the railway

(rolling equipment, the network (permanent way), signalling and electrical systems), and well-trained human resources who can leverage these physical components to develop rail products (service offerings) that effectively meet market demand. The absence or weakness of any single element compromises the entire system's functionality.

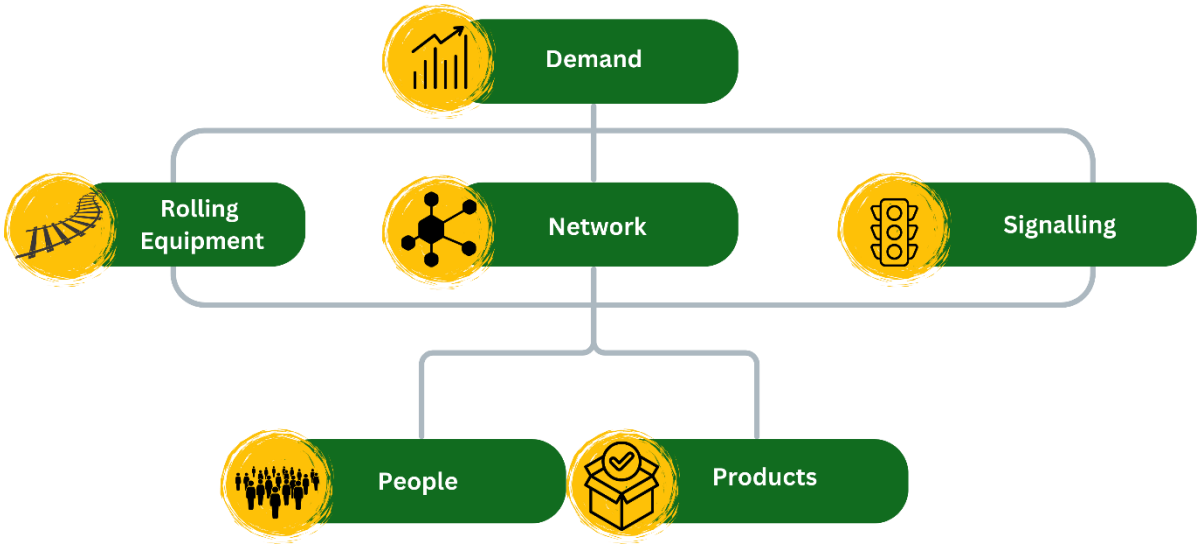

Figure 1: Six foundational elements that must be present and balanced for an effective rail system

Rail system development demands a balanced approach to all these elements because rail infrastructure requires substantial capital investments with the longest lifespan of any transport asset, necessitating strategic planning to maximise its long-term economic value and justify its spatial and community impact.

The Evolution of Rail Policy in South Africa

The South African railway was established by the Act of the Union in 1909 and is therefore just as old as the country itself. The foundational Act for South Africa intended for the railway to be operated on business principles, but in the period between 1910 and 1990, major departures from this principle were evident.

In 1930 in terms of the Motor Carrier Transportation Act, rail became protected, and a permit system was introduced, making it illegal to transport goods without a permit on road. This protection led the way to the railway becoming an instrument for mining development initially but increasingly focused on commercial farming development. Through the development of specialised rail infrastructure and services for South Africa's agricultural sector, including systems for transporting livestock during droughts, connections to grain silos for storage, and links to port elevators for export, the railway cross-subsidised agricultural services using revenue from high-value freight. The positive effect on rural development and commercial farming in rural areas was profound. However, it also had the negative effect of imposing surcharges on manufacturing sectors without reinvesting in corresponding services, leading to underdeveloped manufacturing rail services, and leaving the railway poorly prepared to retain this traffic when deregulation finally came in 1989. While deregulation and the creation of Transnet therefore, in theory, allowed the railway to focus on business principles, the lack of investment and services for manufacturing industries initiated a slow decline in railway income.

The Department of Transport (DoT) initiated a rail policy reform process in 2007, but much of the initial work focused narrowly on regulation per se, without addressing the optimal configuration and function of a railway system to serve South Africa's broader economic needs. This began to change over the last decade, culminating in a comprehensive new rail policy adopted by Cabinet in 2022. This milestone opened the door for substantive reform, followed by the Freight Logistics Roadmap in 2023 which outlined strategic priorities and implementation steps. The Economic Regulation of Transport Act 6 of 2024 established unified oversight mechanisms, while the same year witnessed the return of freight railway operations to the DoT. (PRASA has been with the DoT since its establishment in 2008, and the legal succession of the SARCC in 1990.) The anticipated development of a National Rail Bill in 2026 or soon after will complete this policy framework by addressing rail-specific governance,

access rights, infrastructure management, and operational standards, finally creating a cohesive regulatory environment for South Africa's railway system.

Towards a Rail System in a Developmental State

To fulfil rail's role as an effective tool that serves South Africa's broader economic and social objectives, a fundamental paradigm shift is however required. The biggest shift in thinking for this NRMP is the move from a railway company and narrow focussed Agency (TFR and PRASA) to a railway system. The world has three known railway systems, with just seven national railways describing more than 90% of global tonne-kilometres and passenger-kilometres. These are:

1. Capitalistic-oriented systems of North America (USA and Canada): The railways' core focus is shareholder returns resulting in very efficient, productivity-oriented rail systems.
2. Developmental state railways (Russia, India, and China): The railways' core focus is developmental, implying state support for expansive railways to meet both economic and social needs.
3. Sustainability railways in Europe (Italy, Germany, and France): The railways' core focus is on sustainability, promoting modal shift to rail to alleviate congestion and reduce carbon emissions.

South Africa has no clear positioning in this description, which contributes to the current confusion in how to develop the system. In South Africa's developmental context, the railway system potentially requires components of all three: creating an environment where train operating companies (TOCs) can flourish where indicated, while simultaneously considering economic growth, social development, and environmental awareness in policy, infrastructure development, and spatial positioning. This systemic approach differs fundamentally from a company-centric view by acknowledging rail as a national asset with multiple stakeholders and objectives beyond commercial profitability.

This approach, and within the limits of the state's other developmental obligations, also recognises that funding rail has both private sector objectives and public sector responsibilities, reflecting the dual nature of railways as both commercial enterprises and national assets.

South Africa's Rail System: Current State Assessment

Following the framework of the six fundamental elements required for an effective rail system, this section assesses South Africa's current rail landscape against these criteria, highlighting both challenges and opportunities within each component.

Total Freight Demand

Logistics services address the demand to solve time and place discrepancies, i.e. the gap between where goods are produced (or imported) and where they are consumed (or exported) across the country. In this light, South Africa experienced a total freight demand of 790 million tonnes in 2022. To fulfil this demand, commodities often require multiple movements due to the intermediate use of consolidation centres and distribution facilities, and other supply chain requirements. This resulted in 1.493 million tonnes that were shipped in 2022, indicating that, on average, each freight tonne in South Africa is transported approximately 1.9 times.

This average, however, obscures significant variations across commodity types. Large volumes of bulk export minerals and domestic mining minerals (totalling 508 million tonnes) are typically transported only once, while coal produced for mine-mouth power stations (approximately 100 million tonnes) utilise conveyor belt systems. Consequently, the remaining cargo, primarily intermediate and final manufactured commodities, requires complex supply chain solutions with multiple shipments between supply and demand points, facilitated by an array of logistics facilities. One of the primary objectives is to define and quantify these supply chains to identify potential opportunities for improvement, a summary of which is provided in the NRMP.

Demand for Rail Services

In 2022, rail only transported approximately 150 million tonnes of freight, while the viable rail market is estimated at approximately 262 million tonnes, i.e. a 43% tonnage gap. This translates into a 164 billion tonne-kilometre potential rail freight task that is only 60% fulfilled, resulting in both domestic and export commodities failing to reach markets, or doing so uncompetitively, increasing logistics costs and generating unnecessary externalities where the rail service gap is fulfilled by road transport.

Table 1: Rail Transport Performance Gap, 2022

	Actual 2022	Potential 2022	Gap
Tonnes (million)	150	262	112
Tonne-km (billion)	108	164	56
Value of cargo (R billion)	273	1 316	1 043
Gross TOC T/O (R billion)	40	100	60

In terms of economic value, the railway currently transports commodities valued at R273 billion, whereas it could be handling commodities worth R1 316 billion, confirming the substantial gap in utilised capacity and economic cost given that, for viable rail market spaces and appropriate solutions, rail can in fact reduce South Africa's national freight bill by R50 billion or as much as R100 billion, if externalities are included.

In fact, TOC in South Africa operate in a market where approximately R100 billion in revenue could be earned effectively and profitably, yet only R40 billion of that potential is being realised.

Rail passengers reached a peak in 1982 when 750 million passenger journeys occurred on rail, but this figure declined to 600 million journeys in 2009, soon after PRASA was formed, followed by a significant drop to 125 million by 2020. The impact of the COVID-19 pandemic was noticeable, with only 10 million journeys in 2021. Since then, passenger journeys have shown a steady recovery, increasing to 39 million in 2024. In the same year, PRASA estimated that journeys would double to 64 million by the end of 2025, whereafter significant year-on-year increases would result in an expected demand of 274 million journeys by the end of 2030. More importantly the overarching goal is to reduce low-income households spent on commuting from 50% of monthly income to 10%. Most of this objective can be achieved by rail passenger journeys.

Current State: Rail Network

South Africa's 23 540 km rail network constitutes nearly 2% of the global rail infrastructure, compared to the country's GDP of less than 0.4% of global GDP. This disproportionate relationship indicates that the network is oversized relative to economic output, a challenge recognised for decades without constructive remediation.

Approximately 40% of the network likely has no economic and limited socio-economic utility, while 20% consists of ringfenced systems (mainly export coal and iron ore) that should be considered separately from general rail discussions. Of the remaining 40%, half could form a core backbone accommodating multiple operators and supply chains between major settlements, with the other half serving as dedicated feeder rail systems, which contribute to local solutions while supporting the core network. This NRMP aims to analyse these components comprehensively, avoiding both premature abandonment of potentially valuable infrastructure and rationalisation without due process.

Despite its extensive size, the network exhibits significant design deficiencies. Approximately half of the missing value that should be transported by rail and representing about half of the potential train operating company income, cannot be accommodated with the current terminal network in South Africa. While a comprehensive terminal network design is still evolving, South Africa's Infrastructure Plan, approved by Cabinet in 2022, together with various private sector initiatives, has begun to advance planning in this area. The NRMP builds on these initiatives by providing further guidance on the development of terminal infrastructure across the national rail network.

The network also suffers from serious neglect. Independent technical assessments have been undertaken on both primary export lines, indicating a rehabilitation requirement of about R10 billion for the Ore Line, and about

R10 billion to R15 billion for the Coal Line. No comparable evaluations are yet available for the core and feeder networks. On a conservative basis, a further R50 billion to R100 billion may be required to restore the remainder of the network. The NRMP explores both private sector and government funding options to support this essential rehabilitation.

Current State: Rolling Equipment and Signalling

South Africa possesses a fleet of approximately 2 960 locomotives, encompassing both electric and diesel units, and 80 000 wagons, of which the total includes all categories of fleets (A, B, and C), comprising both active and inactive units. However, this equipment frequently suffers from long turnaround times, disrepair and operational readiness, issues that compromise its effectiveness. The locomotive fleet is also heavily leveraged relative to its value, a situation exacerbated by state capture and subsequent unfortunate events.

The rail network's signalling equipment is outdated, vulnerable to vandalism, and inadequately maintained. These deficiencies necessitate approximately 250 000 manual train authorisations monthly, introducing substantial inefficiencies and safety concerns throughout the system.

Current State: Human Resources

Historically, the railway served as both a significant employer in South Africa and a vocational training institution for many of the country's artisanal and engineering specialisations. Recent years have witnessed a substantial exodus of skilled personnel from the railway sector. While some expertise remains within the system, the skills gap is pronounced and presents considerable challenges for restoration. Given the broader decline in rail-related skills across the sector, it is not appropriate to rely solely on individual rail operators to fulfil the full skills development mandate while also competing with other transport modes and managing commercial pressures. Government therefore has an important role to play in coordinating sector-wide skills development initiatives, including the establishment of rail centres of excellence, strategic partnerships with universities, Technical and Vocational Education and Training (TVET) colleges and Sector Education and Training Authorities (SETAs), and structured training programmes linked to rail reform and investment initiatives.

Current State: Products

Bulk heavy haul products, despite operational challenges, benefit from well-developed technologies, procedures, and service products. Addressing the service challenges in bulk heavy haul primarily requires investment cases and infrastructure repair.

South Africa’s railway sector also has institutional knowledge regarding rail supply chain services for bulk grain transport (silo-to-plant solutions), and the repositioning of domestic minerals for beneficiation (pit-to-plant solutions). In addition, intermediate manufacturing can be serviced through siding-to-siding traffic. The yards were originally developed to assemble trains from sidings, and while this process is well-established, it suffers from serious deterioration.

Rail services for manufactured palletised freight, however, were never fully developed. A description of what is required here is contained in the NRMP, with the core focus being intermodal solutions.

Current State: Approach To Rail Development

A significant challenge that has undermined South Africa's railway system in recent years has been an unbalanced approach to rail development. This imbalance has manifested across multiple dimensions: between network maintenance and operational focus, between different market segments, and between short-term financial considerations and long-term strategic infrastructure development. Railway investments are expensive, and the effects are long lasting. Investing in some elements that could increase capacity (like for instance rolling stock), but not adequately in others (for instance permanent way infrastructure and signalling) can be hugely wasteful and counterproductive. Addressing this imbalance is central to revitalising the rail system.

Call for Stakeholder Input into the Rail Masterplan

A key departure from previous rail planning approaches is the commitment to inclusive, consultative planning across all aspects of South Africa's railway system.

While previous planning frameworks were primarily focused on commercial freight viability and SOE constraints, this process takes a more holistic national approach, incorporating diverse perspectives from specialists during the initial development phase, and expanding to include a wider range of stakeholders as one progress. This mirrors the aim of the NRMP to shift from viewing rail as a discrete SOE with a commercial focus to viewing rail as an integrated component in a system, repositioning rail as a national asset, serving broader economic and social goals and making the South African economy more competitive. We acknowledge that:

- Some gaps inevitably remain in an undertaking of this magnitude.
- Valuable insights will emerge from sources beyond our initial drafting team.

The release of this draft NRMP for constructive public comment is therefore not merely procedural but reflects our genuine belief that broader participation will strengthen the NRMP, transforming it into a comprehensive tool that truly serves South Africa’s economy and growth aspirations.

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Abbreviations

Abbreviation	Full Term
AC	Alternating Current
AES	Advanced Encryption Standard (AES-256)
AFC	Automatic Fare Collection
AI	Artificial Intelligence
API	Application Programming Interface
ATO	Automatic Train Operation
BFI	Blended Finance Investment
BOO	Build-Operate-Own
BOOT	Build-Operate-Own-Transfer
BRE	Business Risk Exposure
BRICS	Brazil, Russia, India, China, South Africa
BRT	Bus Rapid Transit
CAPEX	Capital Expenditure
CBD	Central Business District
CCTV	Closed-Circuit Television
CIO	Chief Information Officer
COPEX	Capitalised Operating Expenditure
COVID	Coronavirus Disease (COVID-19)
CSIR	Council for Scientific and Industrial Research
CSI	Custodian System Identifier / Data Custodian Designation
DBN	Durban
DC	Direct Current
DFI	Development Finance Institution
DORC	Depreciated Optimised Replacement Cost
DoT	Department of Transport
DSA	Data Sharing Agreement
EBIT	Earnings Before Interest and Taxes
EIA	Environmental Impact Assessment
EMI	Electromagnetic Interference
EMME	Transportation Modelling Software
EMU	Electric Multiple Unit
EPWP	Expanded Public Works Programme
ETCS	European Train Control System
EU	European Union
FDM	Freight Demand Model
FIS	Freight Information System
FMCG	Fast-Moving Consumer Goods
GDP	Gross Domestic Product
GFB	General Freight Business
GHG	Greenhouse Gas
GIS	Geographic Information System
GMA	Gautrain Management Agency
GPR	Ground Penetrating Radar
GPS	Global Positioning System
GRRIN	Growth and Resilience Rail Investment Network (macro-model)
GTK	Gross Ton Kilometres
HSR	High Speed Rail
ID	Identification
IEC	International Electrotechnical Commission
IM	Infrastructure Manager
IRERC	Interim Rail Economic Regulatory Capacity
ISO	International Organisation for Standardisation
JHB	Johannesburg
JNR	Japanese National Railways

Abbreviation	Full Term
JSON	JavaScript Object Notation
KPI	Key Performance Indicator
KZN	KwaZulu-Natal
LLM	Large Language Model
LOPA	Layers of Protection Analysis
LRS	Linear Reference System
LVC	Land Value Capture
MCA	Multi-Criteria Analysis
MDBF	Mean Distance Between Failures
MLPS	Main Line Passenger Services
MPT	Multi-Purpose Terminal
MTBF	Mean Time Between Failures
MTEF	Medium-Term Expenditure Framework
MTR	Mass Transit Railway (international operator reference)
MTTR	Mean Time to Repair
NATMAP	National Transport Master Plan
NDP	National Development Plan
NERSA	National Energy Regulator of South Africa
NLCC	National Logistics Crisis Committee
NLTSF	National Land Transport Strategic Framework
NMT	Non-Motorised Transport
NPTSP	National Passenger Transport Subsidy Policy
NRMP	National Rail Masterplan
NRP	National Rail Policy
NSC	National Standards Committee
NTK	Net Ton Kilometres
OBC	On-Board Computer
OEM	Original Equipment Manufacturer
OHTE	Overhead Traction Equipment
OPEX	Operating Expenditure
OTP	On-Time Performance
PIS	Passenger Information Systems
POPIA	Protection of Personal Information Act
PPP	Public-Private Partnership
PRASA	Passenger Rail Agency of South Africa
PSP	Private Sector Participation
QCTO	Quality Council for Trades and Occupations
RAB	Regulatory Asset Base
RAM	Reliability, Availability and Maintainability
RBAC	Role-Based Access Control
RFI	Request for Information
RFID	Radio-Frequency Identification
RFP	Request for Proposals
RISSB	Rail Industry Safety and Standards Board (Australia; reference model)
ROSCO	Rolling Stock Operating Company
RPO	Rail Planning Office
RRT	Regional Rapid Transit
RSR	Railway Safety Regulator
SA	South Africa
SADC	Southern African Development Community
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency Limited
SANS	South African National Standard
SAQA	South African Qualifications Authority
SAR	South African Railways
SAR&H	South African Railways & Harbours
SARCC	South African Rail Commuter Corporation

Abbreviation	Full Term
SARISB	South African Rail Industry Standards Body
SAPS	South African Police Service
SATS	South African Transport Services
SETA	Sector Education and Training Authority
SIP	Strategic Infrastructure Project
SITA	State Information Technology Agency
SMS	Safety Management System
SOE	State-Owned Enterprise
SPAD	Signal Passed at Danger
SPV	Special Purpose Vehicle
SQL	Structured Query Language
SSA	State Security Agency
TCU	Train Control Unit
TER	Transport Economic Regulator
TETA	Transport Education Training Authority
TEU	Twenty-foot Equivalent Unit (container measure)
TFR	Transnet Freight Rail
TIF	Tax Increment Financing
TLS	Transport Layer Security (TLS 1.3)
TNPA	Transnet National Ports Authority
TOC	Train Operating Company
TOD	Transit-Oriented Development
TPT	Transnet Port Terminals
TQI	Track Quality Index
TRIM	Transnet Rail Infrastructure Manager
TSE	Tokyo Stock Exchange
TSI	Technical Specification for Interoperability
TVET	Technical and Vocational Education and Training
UGT	Urban Guided Transit
USA	United States of America
USD	United States Dollar
WACC	Weighted Average Cost of Capital
WP	White Paper

1 Rail Context

1.1 The Historical Context

1.1.1 Relevance of the Historical Context as Foundation Of the NRMP

Understanding the historical development of rail in South Africa, across both freight and passenger services, is essential to contextualise the formulation of the country's first NRMP. The rail system was originally designed and funded as a strategic instrument of economic development, facilitating the movement of bulk commodities, supporting export industries, and enabling regional integration. Over time, however, structural shifts in the transport sector, including deregulation, the rise of road-based competition, declining investment in infrastructure and rolling stock, and institutional fragmentation, contributed to a sustained erosion of rail's market share, operational performance, and financial sustainability. These historical dynamics shaped the current challenges facing the sector, including infrastructure backlogs, inefficiencies, and misaligned funding mechanisms.

The inclusion of this historical context provides a critical foundation for policy development by identifying the root causes of systemic decline and the limitations of past funding and institutional models. It informs the need for a redefined approach to rail planning, funding, and governance, as reflected in the NRMP. By acknowledging both the legacy strengths and structural weaknesses of the rail system, the NRMP is positioned to introduce targeted reforms, diversify funding sources, and re-establish rail as a central component of South Africa's transport system in a manner that is economically viable, operationally efficient, and aligned with national development objectives.

1.1.2 Historical Context of Rail Development in South Africa

The railways of the former Cape of Good Hope, Natal, Transvaal and Orange Free State territories were unified along with establishment of the Union of South Africa in 1910 and finally merged as South African Railways & Harbours (SAR&H) in 1916.

Fourteen years into that dispensation, the Motor Carrier Act of 1930 instituted protection of railways from road competition. During the next fifty-eight years, until road transport was deregulated, rail basked in its protection, technological advances only being implemented when worn out assets were no longer repairable. However, road transport regulation progressively frustrated the contribution it could make to the economy and, in due course, commerce and industry pressed for change.

Ultimately South African Transport Services (SATS) succeeded SAR&H in 1981. It was administered on business principles with due regard to the economic interests and total transport needs of the Republic. Restructuring into divisions followed, each serving its own natural market. One of them was the railway, then still a monolithic organisation that provided commuter, freight- and long-distance passenger services.

Notwithstanding commercialisation of the railway, regulated road transport continued to constrain commerce and industry, so pressure for change persisted until it resulted in deregulation of road transport in 1988. That was followed in 1989 by the Legal Succession Act, which repositioned SATS as two separate entities, namely: A divisionalised state-owned company, Transnet, with the then Department of Public Enterprises as sole shareholder until it was transferred to the DoT on 27 August 2024. The shareholder has mandated it to deliver on the following strategic outcomes[1]:

- To decrease the overall cost of logistics in relation to the transportable gross domestic product.
- To effect and expedite the modal shift, enhancing the role of rail in the national transport endeavour.
- To forge stronger connections between South Africa, the region, and the global community.
- To maximise the social and economic effects of all interventions.
- To engage and leverage the private sector to provide infrastructure and operations, as needed.

[1] 2023/2024 Transnet Annual Report.

The South African Rail Commuter Corporation, an agency of the DoT. Its primary and secondary objects respectively were[2]:

- To ensure that, at the request of the DoT or any sphere of government, rail commuter services are provided in the public interest, and to promote rail as the primary mode of mass commuter transportation.
- To generate income from the exploitation of assets transferred to the SARCC by the Minister of Transport under Section 25 of the Legal Succession to the SATS Act (Act 9 of 1989).

Following this reorganisation:

- All commuter rail fixed and rolling assets were assigned to SARCC.
- Transnet's freight rail division, then named Spoornet, retained the national rail network infrastructure, i.e. all except SARCC infrastructure.
- Spoornet retained all above-rail freight assets, the Blue Trains, all long-distance passenger rolling stock and the associated fixed assets. Long-distance passenger services were rebranded as Shosholoza Meyl.
- Spoornet operated SARCC's commuter trains under contract.
- In 2007, Transnet adopted a monolithic brand, and Spoornet was renamed Transnet Freight Rail.
- In 2009 the Passenger Rail Agency of South Africa was established to combine ownership, operations and maintenance of all passenger rail assets, except the Blue Trains, together with road transport and property development divisions, within a single entity. Its main objectives and businesses are[3]:
  - To ensure that at the request of the DoT, rail commuter services are provided within, to and from the Republic in the public interest.
  - In consultation with the DoT, to provide for long-haul passenger rail and bus services within, to and from the Republic of South Africa, in terms of the principles set out in section 4 of the National Land Transport Transition Act, 2000 (Act No. 22 of 2000, as amended).
  - As its secondary business or mandate, PRASA shall generate income by exploiting its acquired assets, including real estate and property portfolios. In addition, PRASA shall ensure due regard for key government social, economic and transport policy objectives, including the National Development Plan (NDP) and the National Land Transport Strategic Framework (NLTSF).

From an NRMP perspective, PRASA and Transnet, with deep historic-, economic- and social roots, and Gautrain commissioned in 2010, constitute the major operational founding institutions.

1.2 Incipient Problems and Policy Pronouncements

The post-SATS period had been anticipated as a new dawn for both freight- and passenger rail in South Africa. However, after fifty-eight years of protection, Spoornet was numb to competition, its fresh commercial intentions frustrated by generally uncompetitive fixed and rolling stock assets, and an organisational culture not well suited to competing against the private sector. Nevertheless, internal cross-subsidisation from its stalwart coal and iron ore heavy haul lines-maintained Spoornet's financial position.

The South African Rail Commuter Corporation and its successor, PRASA, encountered systemic financial and operational challenges from their inception, resulting in a progressive decline in sustainability and performance. Branch line passenger rail services declined significantly during the 1960s as users shifted to more competitive transport alternatives. These services were subsequently replaced by mixed freight and passenger operations, which themselves were discontinued during the 1970s.

Long-distance passenger rail services have experienced a sustained decline since their peak in 1982, when multiple daily services operated between major urban centres. These services have since been reduced to limited, irregular, or charter operations on selected main lines, with no provision for rural passenger services.

Electric commuter rolling stock has a nominal service life of approximately thirty years. While successive generations were replaced at regular thirty-year intervals up to the introduction of the 5M2 series in 1958, the subsequent replacement cycle expected in 1988 was not implemented. This resulted in a prolonged period of ageing assets, adversely affecting service availability and reliability. The impact of deferred investment persisted until the commencement of regular production of new electric multiple units (EMUs) in 2018, approximately sixty years later.

[2] 2006 SARCC Annual Report.
[3] 2023/2024 PRASA Annual Report.

Although current plans for commuter rail services include upgrades to meet contemporary standards, long-distance passenger services remain constrained by obsolete assets and legacy operational concepts, with limited evidence of modernisation or innovation in service design.

Successive Governments have sought over the year to address these challenges. Key policy documents which chart those efforts are:

- The National Transport Policy White Paper (1996) envisioned safe, reliable, effective, efficient, and fully integrated transport operations and infrastructure that would meet the needs of freight and passenger customers at improving levels of service and cost, in a manner supporting government strategies for economic and social development while remaining environmentally and economically sustainable.
- Moving South Africa (1998) envisioned that, by 2020, transport in South Africa would meet the needs of freight and passenger customers through accessible, affordable, safe, frequent, high-quality, reliable, efficient, and seamless operations and infrastructure. It further envisaged a system that would evolve in an innovative, flexible, and economically and environmentally sustainable manner, thereby supporting government strategies for growth, development, redistribution, employment creation, and social integration, both domestically and within the Southern African region.
- The National Freight Logistics Strategy (2005) identified that the freight system in South Africa was characterised by inefficiencies at both system and firm levels. It highlighted infrastructure shortfalls and mismatches, inappropriate institutional arrangements, a lack of integrated planning, information gaps and asymmetries, a deficient skills base, and regulatory frameworks that were inadequate to resolve industry challenges.
- The Revised White Paper on National Transport Policy (2021) reiterated the vision of safe, reliable, effective, efficient, environmentally sustainable, and fully integrated transport operations and infrastructure that would meet the needs of freight and passenger customers, while improving service levels and cost efficiency in support of economic and social development objectives.
- The White Paper on National Rail Policy (2022) envisioned rail as an affordable, competitive, effective, integrated, reliable, safe, sustainable, and valued mode of transport forming the backbone of South Africa's freight logistics and passenger mobility systems by 2050. It further recognised the sector's history of missed opportunities, strategic missteps, and structural impediments, and emphasised the need to mobilise funding and resources to leverage rail's inherent competitiveness and reposition it within the national transport system.
- The NLTSF (2023–2028) envisioned the development of an integrated and efficient land transport system that would support a thriving economy, promote sustainable economic growth, provide safe and accessible mobility options, foster social inclusion, and preserve the environment.

1.3 Service Collapse and Root Problems

After their all-time high in 1997, commuter services declined steadily to 2012, followed by a further rapid decline that bottomed out at zero passengers during the Covid lockdown. Current operations are generally constrained to low frequency because the signalling systems were vandalised during the lockdown period and the lead time for replacement systems is several years due to tender process and contract execution timelines. Full recovery of services and achieving previous passenger trip highs is only likely in 2032. Long-distance passenger services have experienced such a significant decline in demand to be almost inconsequential within the current transport landscape.

The reliability of South Africa's freight rail network has deteriorated sharply, threatening the competitiveness of its exports. Volumes transported on the export coal line have declined to their lowest levels since 1993, and on the iron ore line to their lowest level in a decade. General freight volumes have fallen even more sharply. Systemic failure of rail freight led to its inclusion on the National Logistics Crisis Committee agenda.

It is therefore appropriate to examine the foregoing outcomes in relation to the incipient problems and the abovementioned policy missions, more particularly the following three that complement one another in plotting a way forward.

Moving South Africa 1998: This is the first policy mission to state a specific timeline, to mention service frequency as well as seamless transport operations and infrastructure, and to articulate constant upgrading, innovation,

and flexibility. Despite dating from 1998, the needle has not yet moved meaningfully on upgrading, innovation and flexibility.

The National Freight Logistics Strategy 2005: The policy mission laments freight system inefficiencies at system and firm levels, infrastructure shortfalls and mismatches, inappropriate institutional structure, lack of integrated planning, information gaps and asymmetries, and regulatory frameworks that are incapable of resolving industry problems. Again, there has been no meaningful advance since 2005 on these issues.

The White Paper on National Rail Policy 2022: This is the first policy mission to recognise and understand that rail has a heritage of missed opportunities, strategic missteps and structural impediments, which require mobilisation of funding and resources to leverage rail's inherent competitiveness to reposition it as the backbone of South Africa's land transport task. The notion of repositioning reminds that the railway system was formerly, as much as half a century ago, the backbone of the land transport task. The WP on National Rail Plan (NRP) is specific about a range of primary, i.e. investment interventions, and secondary, i.e. institutional interventions. This draft NRMP addresses the primary interventions, while DoT is concurrently implementing the secondary interventions.

1.4 The Case for National Rail Reform

1.4.1 The Scale of the Challenge

Complete collapse of a national railway system is a rare occurrence. To put South Africa's situation in perspective, the following three cases are comparable:

1. United States railway rates had been regulated since 1887 under a complex system that stifled rail's ability to compete against trucking companies when publicly owned, operated, and funded interstate highways emerged in the 1950s. Matters came to a head in 1968 when two major railroads, the 18 700km Pennsylvania Railroad, and the 18 600km New York Central, merged to ward off impending bankruptcy. The resultant Penn Central Transportation Company nevertheless filed for bankruptcy in 1970. Appreciating the imperative of averting serial bankruptcy of the entire railroad industry, the federal government intervened through a series of three acts to stabilise and then deregulate the industry. The process included nationalising the Penn Central and other failing railroads as Conrail, restoring it to financial health, and privatising it once more in 1987.
2. Japanese National Railways emerged as a state-owned corporation in 1949, during post-World War II occupation. Accounting was independent of the national budget, and it ended up building many more narrow-gauge lines, ultimately totalling 21 400km in 1981, than their revenue could ever support. Despite subsequently pruning eighty-odd rural lines with insufficient passengers, it descended ever further into debt. By 1987 JNR 's operating ratio had risen to 147%, its debt had ballooned to USD 442 billion, and the deity of Japan could find no alternative but to privatise it. The solution was to reconfigure viable assets and functions within seven debt-free private entities collectively known as JR Group, and to shift the debt via the Japanese National Railway Settlement Corporation to the national budget. The high-speed companies, JR East, JR Central and JR West, in due course became successful companies in their own right and listed on the Tokyo Stock Exchange. Recently, JR Kyushu managed to leverage sufficient value from property interests to also list on the TSE. The remaining JR Shikoku, JR Hokkaido and JR Freight have not yet risen to the performance of their listed siblings and remain under the oversight of Japan Railway Construction, Transport and Technology Agency as parent entity. Appreciate that Japan's urban railways are neither owned nor operated by national government and were therefore not affected by JNR's course of events.
3. Canadian National Railway had consistently failed to achieve performance parity with its North American peers due to organisational ineptitude. In 1992, a new management team led by former federal government bureaucrats prepared it for privatisation by increasing productivity through aggressive management cuts, widescale layoffs and continued abandonment or sale of branch lines. In 1995 the Government of Canada enacted the CN Commercialisation Act, and by the end of that year it had completed an initial public offering and transferred all its shares to private investors. Thereafter CN commenced a series of aggressive acquisitions and divestitures and, in addition to its transcontinental route, acquired a route to New Orleans on the Gulf of Mexico by purchase of the Illinois Central Railroad. With a present network size of 32 000km, it maintains its operating ratio in the 58-65% range.

Some common themes that pervade the foregoing examples are deep distress, national impact, imperative interventions, urgency, inevitability, disagreeable options, forced choices, insufficient funding, and unresponsiveness.

They show that, no matter how deep the distress, there are ways and means to restore performance, stability and value, as well as pride and respect, to achieve a broadly satisfactory outcome from the perspectives of citizenry and businesses, as well as the railway industry and its employees. They also show that it is necessary to make good the past and then set it aside, followed by positioning the new dispensation for a sustainable future. These are not sticking plaster interventions: Government policy and ownership were at issue in all the examples, and only governments have the wherewithal to remediate such failures.
The mission of this NRMP is to achieve that outcome in South Africa.

1.4.2 Policy and Legislative Guidance

The NRMP has not been compiled in a vacuum but is based on sound policy and legislative frameworks that aim to improve the rail system in the country by rectifying the problems and issues that have developed over a long period of time, as reflected in the sections above.

The NRMP is formulated within a comprehensive policy and legislative framework that provides the strategic and regulatory foundation for the development and transformation of the rail sector in South Africa. South Africa's rail policy is grounded in the White Paper on National Transport Policy (1996), which established key principles of modal integration, economic efficiency, and a balanced transport system. These principles were further developed in the Moving South Africa Strategy (1998), which set out a long-term vision for a demand-responsive and customer-oriented transport system.

The Revised White Paper on National Transport Policy (2021) reinforces this policy direction, with increased emphasis on sustainability, spatial transformation, and the optimisation of rail as a strategic mode. It highlights the importance of shifting suitable freight from road to rail and strengthening passenger rail as part of an integrated public transport network.

The White Paper on National Rail Policy (2022) provides the central policy framework for the restructuring of the rail sector. It introduces a transition from a vertically integrated system toward a model based on:

- Separation of infrastructure management and train operations.
- Open access to enable third-party operators.
- Increased private sector participation.
- Strengthened economic and safety regulation.

This policy direction directly informs the NRMP by defining the future institutional and operational configuration of the rail sector. Rail development is further guided by national freight and transport strategies. The National Freight Logistics Strategy (2005) and the Freight Logistics Roadmap (2023) position rail as a critical enabler of economic growth, export competitiveness, and reduced logistics costs.

Rail funding is guided by broader infrastructure and public transport policy frameworks, including the Draft National Public Transport Subsidy Policy (2024) and the South Africa Infrastructure Plan (2022). These recognise the distinct funding requirements of rail subsectors, including:

- Operational subsidies for passenger rail services as a public good.
- Targeted capital investment and catalytic funding mechanisms for freight rail.

This differentiated funding approach is fundamental to the financial sustainability of the rail sector and is reflected in the NRMP. The rail policy framework is aligned with the NDP, which identifies efficient freight logistics and reliable public transport as key drivers of economic growth and social development.

The policies discussed above are complemented by long-term planning instruments such as National Transport Master Plan (NATMAP) 2050 and the NLTSF (2023–2028), which promote an integrated, multimodal approach to infrastructure planning. Collectively, these frameworks position rail as the backbone of a sustainable and efficient national transport system.

Further to the above policy summary. the rail sector operates within a structured legislative environment that governs economic regulation, safety oversight, and institutional responsibilities. Key legislation includes:

- The Economic Regulation of Transport Act, 2024, which establishes a unified framework for economic regulation, including access pricing and competitive oversight.

- The Railway Safety Act, which provides for safety regulation through the Railway Safety Regulator.
- The National Land Transport Act, 2009 (as amended in 2023), which governs land-based transport planning and institutional roles.
- The Infrastructure Development Act, 2014, which supports the coordination and prioritisation of strategic infrastructure investments.

Collectively, these policy and legislative instruments provide the enabling environment for the NRMP. They define the structural reform of the sector, establish regulatory and safety requirements, guide infrastructure investment, and support funding mechanisms. The NRMP therefore serves as the implementation instrument through which these policies are translated into coordinated and actionable programmes for the development of South Africa's rail system. Government has already started to execute some of the main rail policy directives by launching a Request for Information (RFI) for passenger rail on 26 October 2025, which invites private sector participation to modernise infrastructure, develop regional/high-speed rail, upgrade depots, and implement smart ticketing. Government maintains ownership of assets.

1.5 The NRMP Golden Thread

1.5.1 The Significance of the Network

South Africa's rail infrastructure originated from 19th-century investments made on limited budgets and without a framework for a long-term, national development strategy. The White Paper on the NRP highlights infrastructure as the primary driver for South Africa's rail revitalisation. It is important to recognise that many of the challenges addressed by the NRMP are fundamentally related to infrastructure, specifically the rail network, its energy supply and train control systems, and the facilities where clients and users interact. For simplicity, the discussion below refers collectively to these components as "the network," covering its origins, current state, and future direction.

Throughout the 20th century, successive custodians of the network sought to maintain and improve it within the constraints of its legacy. Technological upgrades were implemented as they became available, often adapted to local conditions. A notable example is the adaptation of locomotives: narrow-gauge locomotives were derived from standard-gauge designs, resulting in taller, narrower units with lower power output and reduced tractive effort. Limitations in axle load and stability further restricted speeds on curves, while the low production volumes increased unit costs relative to global standards.

South Africa's railways have demonstrated exceptional prowess in many application fields, e.g. its understanding of wheel-rail interaction, track structures and train dynamics positioned it in the heavy haul top league. Notwithstanding such achievements, its railways have always been dependent on foreign Original Equipment Manufacturers (OEMs) for fundamental technological advances. Thus, while OEMs have supplied the country with the technology and support it has requested, in global markets they have had to advance far beyond local requirements to remain competitive. For example, maximum passenger train speed on conventional track (standard-gauge) has progressed from 100km/h in the early 1900s to 200km/h in the 1970s. Aside from technology, there was a fundamental need to ease curves so that freight- and passenger trains could operate at higher speeds.

In contrast, the Gauteng to Cape Town line through the wide-open Karoo, for example, is beset with tight curves that only allow 90km/h: However, there has been no incentive to ever ease those curves, because no OEM has produced narrow-gauge trains that go materially faster. Freight suffered a similar fate, legislated protection from competition removed any incentive to continuously increase the network's permissible axle load, so now much of the network is characterised by short, light trains as originally constrained by vacuum brakes. Similarly, the network cannot shift low-density high-value time-sensitive freight to rail, so there is no demand for intermodal terminals at which to transfer such freight from road to rail. Overcrowding of commuter trains, which was problematic even before PRASA's decline, follows from branched network configurations that prevent all lines from operating simultaneously at their nameplate signalling headway. The challenges of South Africa's rail network have created a vicious circle of inability to support higher performance that suppresses demand for higher performance. The economy has nevertheless been sufficiently resilient to default to road transport to some extent, but at a high price in terms of transport costs and externalities, as well as foregone development and growth.

In the 21st century, the challenges previously identified have significantly weakened not only the railway system itself but also the broader economy and society that it was designed to support. The network is at the core of this challenge: pressures within the heavy haul segments, which historically provided cross-subsidies to the less competitive portions of the network, have reached a critical point, resulting in systemic strain across the entire railway system.

1.5.2 The NRMP Intervention

International literature shows that systems and organisations can adapt based on three models, namely, mechanistic, organismic and socio-cultural. These models underscore the continued relevance of the National Freight Logistics Strategy of 2005, which highlighted systemic inefficiencies within South Africa's freight sector.

These include infrastructure deficits and misalignments, an institutional framework not suited to sector requirements, limited integrated planning, information gaps, skills shortages, and regulatory frameworks insufficient to address sector challenges. These considerations are equally applicable to mass mobility and passenger rail. Accordingly, the NRMP aims to position the country's railways as an adaptable socio-technical system, capable of responding effectively to evolving operational, economic, and social demands.

This NRMP is intended to serve as the basis for stakeholder consultation. Its descriptive approach is designed to stimulate engagement and capture a wide range of insights, which will inform the final NRMP. This approach aligns with the primary and secondary interventions outlined in the White Paper on the NRMP, as follows:

Primary Intervention: Rail Sector Investment

Private sector participation is expected to play a significant role in funding rail sector investment. Such investment should focus on adapting the network to address the issues identified in the section on the significance of the network:

- Tiered network investment: Prioritise investment in routes and applications where legacy infrastructure is insufficient and replace it with contemporary, fit-for-purpose infrastructure. Modern rail is a high-capacity, heavy, and fast mode of transport; partial measures have proven ineffective.
- Targeted network strengthening: Recognise the heterogeneity of network traffic and concentrate resources on specific applications and routes, including heavy haul, heavy intermodal, regional rapid transit, metro rail, and, in due course, high-speed rail.
- Investment flexibility: Enable private investors to respond to market volatility and uncertain growth opportunities through differentiated arrangements such as concessions and long-term leases.
- State retention with adaptive leasing: Maintain core rail infrastructure under state ownership while providing long-term leases where continuous adaptation to external drivers is required, for example, aligning heavy haul with global commodities markets and metropolitan networks with multimodal integration needs.

Secondary Intervention

Institutional Repositioning. Institutional reform is already underway, with several key initiatives marking progress:

- Establishment of the Interim Rail Economic Regulatory Capacity.
- Issuance by Transnet Rail Infrastructure Manager of slot applications under the Network Statement for potential Train Operating Companies.
- Launch of RFIs to assess private sector interest in investment and partnership for the rehabilitation and improvement of rail and port infrastructure. The three RFIs, two focused on heavy minerals and one on containers/heavy intermodal, align with the proposals for two minerals networks and a heavy intermodal network outlined in Chapter 7.4 of the NRMP. In addition, a series of passenger rail RFIs were issued to test market appetite for smart ticketing and fare collection systems, depot management and maintenance models, commercialisation of fibre and digital infrastructure, operational resilience solutions, and long-distance regional rapid transit concepts.
- Vertical separation of Transnet Infrastructure Manager (IM) from Transnet Freight Rail (TFR).
- Initiation by Transnet of a Request for Qualification to select a partner for the establishment of a rolling stock leasing company.

These measures and the resulting interfaces within the sector create opportunities for socio-technical adaptation within the emerging railway ecosystem. They provide confidence that the sector is progressing toward a resilient, sustainable structure and is less likely to revert to previous operational inefficiencies.

1.6 The Draft NRMP Structure

The structure of the NRMP is deliberately designed to bridge the gap between policy intent and implementation. The Plan is organised to ensure a logical progression from context-setting and diagnostic analysis through to strategy formulation, investment planning, and execution. It begins with a clear articulation of the policy and strategic context, ensuring alignment with national objectives and providing a common framework for decision-making. This is followed by a comprehensive sector overview and diagnostic assessment, which establishes strong evidence base by examining infrastructure condition, operational performance, demand patterns, and institutional arrangements across both freight and passenger rail.

Building on this foundation, the NRMP sets out a long-term vision for the rail sector, supported by clearly defined objectives and strategic pillars. These include network revitalisation, capacity expansion, improved reliability and safety, and the facilitation of private sector participation within an open access environment. The network development and investment framework translates these strategic priorities into spatially defined interventions, identifying priority corridors, infrastructure upgrades, and expansion requirements. Importantly, this component also addresses investment sequencing and prioritisation, ensuring that limited resources are directed toward projects with the greatest economic and operational impact. The funding and financing framework provides a structured approach to mobilising the resources required to implement the Plan. The implementation roadmap consolidates these elements into a phased programme of action.

The chapters that follow build directly on this foundation. The detailed sector analysis provides a deeper interrogation of the current state of the rail system, while subsequent chapters translate identified challenges into strategic interventions and investment programmes. Institutional, regulatory, and funding considerations are further unpacked to ensure that proposed solutions are practical, implementable, and aligned with the evolving policy environment.

2 Freight Rail Overview

2.1 Purpose of the Chapter

The purpose of the chapter is to establish a detailed knowledge base on the existing freight rail network, understand its strategic importance within national and regional logistics systems, and define the critical interventions needed to optimise and revitalise freight rail services.

2.2 Introduction

Freight rail volumes declined from 226 million tonnes in 2017/18 to just over 150 million tonnes in 2022/23. This decline stems from a combination of historical missteps, such as an oversized network and cross-subsidisation, state capture and its fiscal fallout, fragmented investments, deferred maintenance, ageing infrastructure, and delayed reforms, all compounded by a challenging external environment. The narrow-gauge network, combined with substandard alignments and ageing structures, makes the network largely uncompetitive, especially against road freight, even for bulk commodities like coal and grain. As a result, South Africa has struggled to capitalise on recent commodity price booms in mining exports, while general rail freight has significantly decreased due to the inability to compete with road-based logistics services. Key focus now is the network's capacity and asset condition in relation to its ability to meet the demands of future freight. Thus, this chapter examines the requirements needed to support national, export, cross-border, and continental freight movements.

The Government is promoting reforms that will allow the system to:

- Competently convey a major share of the total land transport task in its own right.
- Serve as the low-cost, reliable long-haul partner with which other modes naturally integrate when rail's strengths support intermodal logistics over longer distances.

At a lower level, the focus is on identifying a minimum viable network that can capture key freight markets, using salvaged or upgraded heritage infrastructure where possible.

2.3 Current Challenges

The main problems identified in the rail freight arena are as follows:

- Absence of equitable road pricing, and institutional bias towards road.
- A capital investment backlog and inadequate funding.
- Obsolete and ageing infrastructure and rolling stock.
- Outdated technologies.
- Procurement and contractual issues causing shortages of critical spares, equipment, and materials.
- Theft and vandalism of infrastructure and rolling stock components.
- Low performance and operational inefficiency.
- Low permissible axle mass.
- Narrow-gauge.
- A former monopolistic market structure that has left the current system uncompetitive.
- Cross-subsidisation amongst current operating divisions, thus skewing costs and returns.

Resulting in:

- Low market share.
- Underutilised infrastructure.
- Substandard branch lines that cannot compete with road.

2.4 System Performance

The 2023/2024 FY is typical of the present reality, where the rail system demonstrates variable performance across commodity segments, with notable operational inefficiencies:

- Axle loads: Coal and iron ore trains operated at higher axle loads of 26t and 30t respectively, and general freight trains operated at lower axle loads in the18–20t range. Such performance compares poorly in a world where most significant railways operate general freight at 25 t/axle or higher, while coal heavy haul at 26t/axle is only marginally above the general freight benchmark and falls far short of heavy haul leaders.
- Train lengths: While coal and iron ore trains operated at longer consists (up to 308 and 348 wagons respectively), this apparent high performance belies the inordinately low axle loads that require many more wagons per train to convey the required payload tonnage. General freight trains were shorter (80 wagons maximum, many much shorter), which increase operational complexity.
- Train speeds: Loaded and empty train speeds were uniform across commodities, 60 km/h when loaded and 80 km/h when empty. Loaded coal trains used to operate at 80km/h, and the international benchmark for heavy intermodal is 120km/h. At only 60 km/h, rail is out of the contest with road which maintains speeds higher than this and enjoys greater flexibility at loading and unloading locations, while intermodal rail needs to make up significant time on the line haul to compensate for drayage to and from origin and destination terminals.
- Load to tare ratios: Iron ore wagons on the Sishen Saldanha line have South Africa's highest ratio of 5:1, compared to more than 6:1 in other similar operations around the world, while general freight with its poor 2.6–3.7:1 lagged its heavy intermodal counterparts that achieve 4.4:1. These disparities reflect the exponential increase in load to tare ratio as permissible axle load is increased, due to the mass of many wagon components and design requirements being largely independent of payload.
- Punctuality: Iron ore and coal services had considerable delays (320 and 334 minutes), but general freight was even less reliable, with arrivals delayed by up to 888 minutes and departures off by 134 minutes. Note that the arrivals delay equates to over 14 hours: For comparison, a truck can reach anywhere in South Africa within a day from Gauteng.
- Cycle times: Iron ore and coal achieved relatively poor cycle times (104 and 98 hours), while general freight experienced lengthy turnaround times (301 hours) at average haul distances less than those on the heavy haul lines. General freight is generally not considered viable/competitive for distances under 600 km, implying that the current general freight service and supporting technology require major repositioning.
- Network and asset utilisation:
  - Rail assets are very expensive and need to be used intensively to derive financial gain. The Key Performance Indicators (KPIs) shown below do not reflect an acceptable level of productivity:
  - Rail network availability stood at 85%. Although difficult to quantify, it should be above 90%.
  - General freight density ranged from 3.01 to 5.60 Gross Ton Kilometre (GTK)/Route-km, depending on corridor, whereas many other railways achieve between 10 and 20 GTK/Route-km.
  - Asset utilisation (GTK/NTK) was highest for general freight (above 1.7 compared with around 1.4 for heavy haul) indicating that more energy is wasted hauling deadweight. This metric deserves another name. Applying it to an empty wagon, i.e. GTK/0 yields infinity.

2.5 Detailed Knowledge Base of Freight Flows

In 2022, South Africa's economy moved 672 million tonnes (mt) by road and rail. Total volumes are projected to grow to 1 020 million tonnes by 2053 (GAIN FDM™). Modal and sector split per economic sectors are as follows:

- Mining (394mt; 58.7%): Road = 65.4%; Rail = 34.6%
- Manufacturing (193mt; 28.7%): Road = 96.8%; Rail = 3.2%
- Agriculture (85mt; 12.7%): Road = 98.7%; Rail = 1.3%

Production (and some import) of 235 mt of coal represents 35% of South Africa's total freight by weight. The bulk of manufacturing involves stable food production, with a large share of N1 and N3 highway freight being palletised food and beverages, offering clear opportunities for rail freight solutions. The fruit industry is well established, but unreliable reefer equipment has damaged rail's reputation. By 2053, freight supply is expected to rely more on imports (rising from 8% to 13%), while production drops from 92% to 87%. Local demand is set to decline slightly, with exports increasing from 26% to 29%. Rail needs to gear itself for the slightly larger increase in imports versus exports.

2.6 Network Capacity and Asset Condition

The existing network has a theoretical capacity of 240 to 250 mtpa, whereas 226 mtpa was conveyed in the 2017/18 financial year. However, for FY2025/26, the declared network capacity is only 209 million tons, reflecting the many challenges that rail is facing. The expected volume currently is considerably lower than this, however, some spare capacity is reserved for redundancy and recovery due to network instability caused by theft and vandalism.

2.7 Freight Utilisation

Figure 2-1 below illustrates the gap in freight rail market share across key segments (research by GAIN FDM™). In export mining, this gap represents unrecoverable volumes and lost foreign income (Iron Ore = 16%; Coal Mining = 12%; Other export mining = 24%), costing the South African economy an estimated R150–R300 billion annually. A major opportunity lies in high-value, low-density, time-sensitive rail-friendly freight, typically intermodal, with large volumes currently on road instead of rail, notably in intermediate manufacturing (29%) and finished palletised goods (30%), but Transnet has not yet moved to grasp it. This represents a great opportunity for the local rail industry potential is concentrated on the Gauteng to Cape Town, eThekwini, and Gqeberha routes, which currently convey negligible amounts of such traffic because their narrow-gauge infrastructure is not competent to compete with road hauliers for it: The NRMP will enable rail to exploit this opportunity by upgrading these routes to standard-gauge, to enable operation of double stack container trains and double or triple-deck automotive trains, to increase total freight rail revenue by 40%.

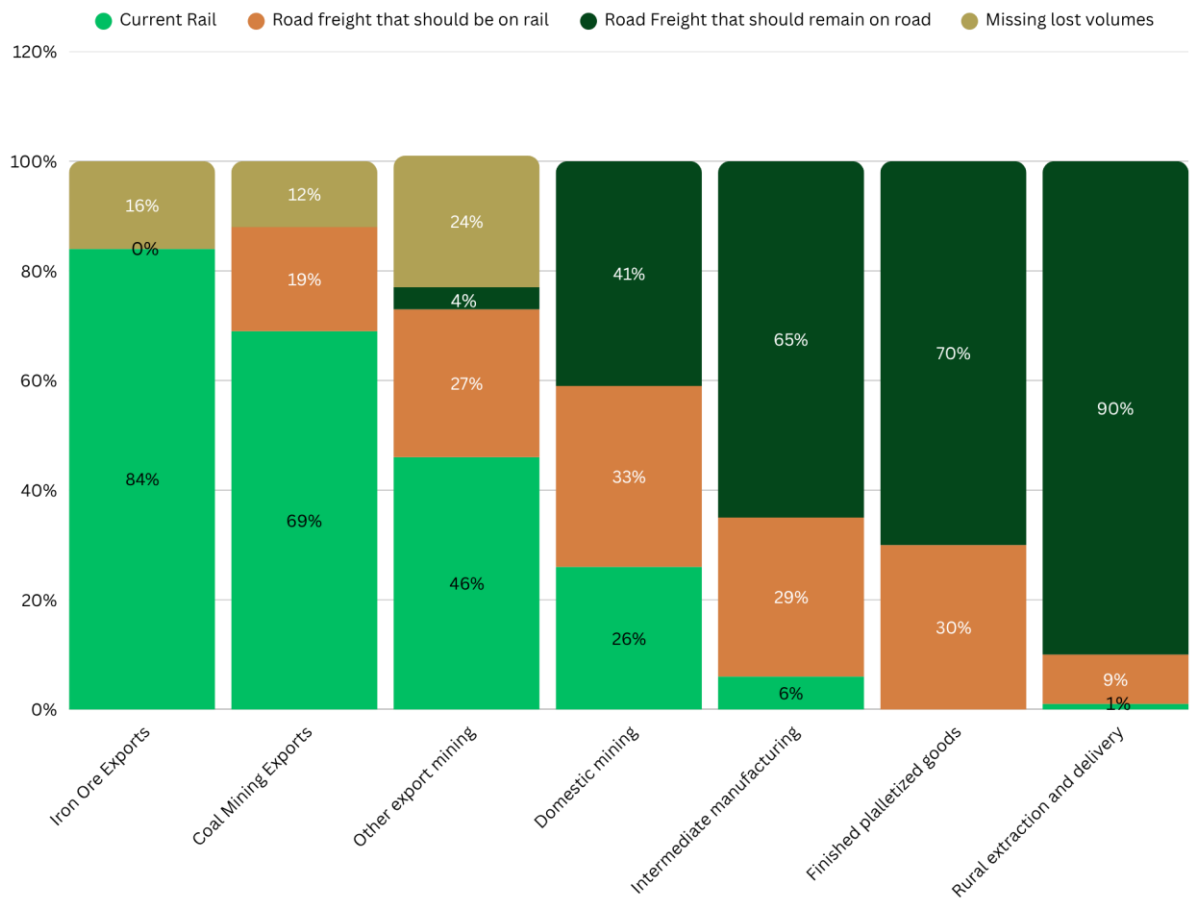


Figure 2-1: Rail's current position and potential tonne-km market share as a percentage of total market share for each segmentation type (FDM™ 2022)15

2.8 International Benchmarking

South Africa's freight rail network is twice as large as needed for its economy. Unlike the US, which reduced its network by 40% and focused on high-density corridors, SA's bloated network creates a mismatch with capacity. One of the objectives of the NRMP is to focus investment on core freight corridors, like North America, which can boost efficiency and retain rail-friendly freight. While SA's bulk lines reflect this success, general freight lacks similar focus. Network rationalisation will be politically supported, as in the US, where initial workforce reductions led to long-term job creation. South Africa's proposed network reduction in the 1990s was never implemented due to job concerns, despite evidence it would lower logistics costs and drive development.

2.9 Rail Reform and Network Access Philosophy

Government policy aims to enable rail access to private operators with the objective of enhanced responsiveness to demand, higher quality service, and more sustainable operations. This process is well underway. Rail reform, outlined in the White Paper on NRP investment backlog and limited funding by separating the rail market structure into infrastructure or network operators and train operators. This split enables private sector participation to fund both infrastructure and rolling stock. The Transport Economic Regulator (TER) will oversee access, fees, market behaviour, public sector involvement, and train path allocation, while the Rail Safety Regulator will adopt a risk-based approach to safety management. Government will fund or arrange funding for infrastructure, while train operators will fund their rolling stock.

2.10 Status of the Freight Logistics System after the Introduction of the Roadmap

The Freight Logistics Roadmap identifies the immediate and underlying structural causes of the continued decline in the performance of South Africa's freight logistics system. The roadmap outlines a clear path to stabilise and improve volumes transported on the network in the short term and to reform the logistics system in the long term, in line with existing policy commitments. It is also a fundamental guiding document for Transnet, which articulates both the challenges to be solved in the freight logistics system and the role and positioning of Transnet within this system as it goes through various stages of reform. The aim of this Roadmap is therefore to set out an evidence-based, implementable and achievable path for reform of South Africa's logistics system in a manner that effectively addresses challenges and thus enables economic growth, diversification, and transformation.

The implementation of the roadmap is overseen by the DoT, National Treasury and the Presidency through the National Logistics Crisis Committee (NLCC), to enable a coherent, integrated response to the challenges within the national logistics system.

2.11 Rolling Stock

Government recognises that the South African rail environment has distinct technical, operational and economic characteristics, including narrow-gauge applications, mixed traffic demands, and route-specific infrastructure conditions, unlike more standardised railway environments. These features are reflected in the current rolling stock mix and in historical procurement approaches. At the same time, South Africa has successfully introduced modern, high-performance locomotive fleets in recent years, including Classes 15E, 19E, 20E to 23E, and 43DE to 45DE, supported by established specification, testing and acceptance practices.

These conditions are partly the result of the historical development and legacy structure of the freight rail system. As the sector moves towards open access and seeks to increase rail's share of freight tonnage, the need for a clear and coordinated national approach to rolling stock becomes more important. While operators have historically applied their own specifications, standards and testing practices, the NRMP adopts a national policy perspective intended to create a more consistent framework, support equitable access to the network, and encourage investment in the rolling stock sector.

2.12 Operating Subsidy Trends

Transnet was established under the Legal Succession Act of 1989 as a business to be commercially operated with no government subsidy. Until 2014/15, TFR was profitable, but thereafter revenue began to decline, and profits became erratic, resulting in the current financial challenges and discussions about an operating subsidy to alleviate them. Globally, where there is above-rail competition there is aversion- or policy impediments to operating subsidies because the latter may distort the playing field. Government therefore prefers, to the extent that they are unavoidable, for capital subsidies through investment in facilities that are open to all operators.

2.13 Capital Investment Trends

Capital investment in new higher-performing freight assets has been limited. Transnet has largely focused on periodic repairs to outdated freight wagons and other assets, under the guise of capitalised maintenance. In this way investment is made in inherently uncompetitive assets that are not up to the challenge of competing with road transport. Private sector investment in freight rolling stock forms part of the Government's way forward, with small investments already made in specialised wagons and locomotives for industrial and mining entities. The White Paper on NRP 2022 and the Roadmap for the Freight Logistics System in South Africa strongly support significant private sector investment in much-needed assets.

2.14 Land Holding Developments

Future land developments will be shaped primarily by intermodal logistics and road-to-rail shift. In addition to necessary line haul infrastructure, there will be requirements for terminals to transfer freight between rail and road and vice versa, which are expected to evolve into freight villages or inland ports in strategically located areas. Automotive transport will complement heavy intermodal, each requiring specialised terminals. While South Africa's pit-to-port systems are established, the NRMP sets out significant rail infrastructure expansion to create capacity for high value, low density, time sensitive freight, thus requiring more land. Government will address historical land claims, customary ownership, and insecure land rights where they pose risks to such expansion and new developments through appropriate policy dispensation.

2.15 Security Challenges

Security threats, particularly theft and vandalism, continue to undermine rail reliability. The NRMP promotes a shift to infrastructure-light technologies, reducing exposure to vulnerable systems like overhead wires and lineside signals. Rail technology is entering a new era, with renewable energy, like solar and wind, supporting electric traction where viable, and on-board battery energy storage as well as hydrogen showing promise as a low-emission alternatives, and over-the-air train movement authorisation. One of the DoT Planning Component's first challenges will be selecting appropriate traction energy and signalling technologies.

2.16 Corridor Capacity Outlook

One of the purposes of the NRMP is to reassess corridor capacity based on a competitively positioned rail system with matched infrastructure and rolling stock. Heavy intermodal is a case in point. Current demand cannot be inferred from historical performance because the service offering required to attract that traffic does not presently exist. Its potential must therefore be assessed through forward-looking modelling, including the FDM.

A similar approach applies to mineral lines that may be concessioned or leased to the mining industry. Existing performance on a number of these corridors is poor, and substantial volumes have shifted to road, placing additional pressure on the parallel road network. Where mining customers invest in higher axle loads, longer trains, and improved operations and maintenance, these corridors may be able to support more efficient and competitive rail services.

An RFI process was launched by the Minister of Transport in March 2025 to gauge private-sector interest and capacity to invest in and operate strategic freight corridors. The positive outcome will result in a range of Request for Proposals (RFP) going to market during 2026.

2.17 Conclusion

The present South African rail network is a product of decades of stunted infrastructure development and self-inflicted operational complexities. It seeks operational efficiency in the face of significant challenges due to an evolving economy, shifting demand, and the need for modernisation. The diversity of different types of lines, varied asset classifications and operational conditions is purported to provide flexibility but in reality, adds complexity, adding impediments to the rail system in its quest to compete effectively with road transport. Additionally, the financial burden on rail is exacerbated by the structural imbalance between rail and road: Transnet has been required to fund and maintain its rail infrastructure without subsidies, while road freight benefits from access to South African National Roads Agency's (SANRAL's) and other road networks at a significantly lower cost.

To address these challenges, Government's rail reform is essential to fast-track the structural changes needed for economic recovery. A key reform element is the introduction of third-party access to the rail network, to drive efficiencies and enhance competitiveness. The fundamental objective of the NRMP, from a freight perspective, is to position rail in applications where it can perform at its best. This is envisioned through initiatives aimed at differentiating services and infrastructure to leverage rail's strengths, along with fostering competition among operators on an open access network to enhance operational efficiency. Consequently, rail freight services will gravitate primarily to:

- Heavy haul trains for bulk commodities with fixed-consist trains between defined O-D pairs.
- Heavy intermodal services with fairly fixed-consist trains between defined O-D pairs, although intermediate block switching could occur where particular trains serve multiple destinations.
- Freight in wagons dedicated to specific commodities, e.g. automotive, bulk liquids, cement, grains and timber, on limited routes.

3 Commuter Rail Overview

3.1 Introduction

The current performance of the three urban rail systems in South Africa, namely: Gauteng, Cape Town and eThekwini are hampered by high-entropy networks that fail to achieve the headways supported by existing signalling systems. (Entropy is a collective noun for bottlenecks and constraints that limit the capacity of a rail corridor.) Additionally, poorly maintained tracks, low service frequencies, outdated or absent operations and maintenance management systems, and inadequate integration with other public transport modes and operators contribute to the inefficiencies. As a result, commuter rail has been overtaken by minibus taxis, which despite their lower capacity and fragmented networks, now dominate. A key barrier to rail use is low service frequency, prompting commuters to opt for higher-cost, on-demand options. International best practice suggests that headways below six minutes, preferably around three minutes are necessary to achieve turn-up-and-go service levels.

The interventions proposed in this chapter aim to transform rail into the rapid transit backbone for metropolitan municipalities, with the goal of:

- Integrating all public transport operators and modes with rail.
- Alleviating traffic congestion.
- Facilitating the shift from road to rail.
- Reducing GHG emissions by significantly shifting the mobility task to an electrified transport mode that can be powered by renewable energy.

3.2 Commuter Rail Development

To achieve these goals, the development of commuter rail services must follow a coherent strategy that reflects their complementary roles within an integrated urban transport system. Metro rail serves in dense urban areas with frequent stops, moving 40,000–80,000 passengers per hour, while RRT offers faster, longer-distance connections to peripheral areas. Integrating both, enhances overall network coverage and supports modern, decentralised travel patterns. The following key interventions are proposed:

- Reconfigure metro networks to allow all lines to operate independently and exploit signalling headways of three minutes or less, to introduce the high-frequency services for which the signalling system is designed, thereby creating capacity for the patronage that a well-run railway can attract.
- Separate freight and commuter networks to eliminate contention between metro and freight operations, enabling reliable scheduling, including overnight freight services, and reducing peak-period interference.
- Implement access control and automatic fare collection, as part of the funding strategy.
- Establish hierarchical, modal, fare, and operational integration with other transport modes and systems, to ensure equitable access, enabling travel from any origin to any destination across the metropolitan public transport system for an affordable fare.

3.3 PRASA Operational Performance

In the 2023/24 financial year, PRASA achieved good progress in its operational recovery and performance. The following highlights key aspects of its operational outcomes:

- Train operations and reliability: In 2023/24, PRASA increased the number of operational lines from 25 to 33, exceeding its service recovery targets. Train trips rose by 92% to 131,584, driven by improved service frequency, the reintroduction of Saturday services, reduced off-peak fares, and targeted marketing. Punctuality also improved, with 87% of trains running on time, surpassing the 80% benchmark.
- Passenger volumes: Ridership surged in 2023/24, with Gauteng increasing by 160% (7.3 million to 19 million), the Western Cape by 225% (4 million to 13 million), and KwaZulu-Natal by 268% (1.9 million to 7 million). Nationally, PRASA transported 39.4 million passengers, exceeding its 35 million targets. However, overall performance remains well below historic levels, with PRASA averaging 43 million monthly trips from 1998/99 to 2008/09, peaking at 54 million in 2008/09. In contrast, between January 2021 and July 2022, monthly averages dropped to just 1.7 million trips, only 4% of the long-term average and 3% of the 2008/09 peak. This sharp decline highlights ongoing systemic and infrastructure challenges.

- Operational costs: The cost to PRASA per passenger trip rose steeply over the years, climbing from R10 in 2014/15 to R21 in 2016/17, R44 in 2018/19, and R68 in 2019/20. This reflects declining ridership alongside increasing inefficiencies.
- Security and safety: Security incidents dropped by 80%, from 4,747 in 2019/20 to fewer than 1,000 in 2023/24, due to increased security measures.
- Rolling stock availability: By 2023/24, new EMUs were operating on 75% of reinstated lines, contributing to improved service quality and supporting passenger growth.
- Modal shift: Between 2013 and 2020, many rail users in Gauteng and the Western Cape shifted to minibus taxis, as rail services collapsed. This shift was less clearly observed in KwaZulu-Natal and the Eastern Cape, but the overall trend underlines the erosion of rail's role in urban mobility and the growing reliance on informal modes.

3.4 Stations

Urban rail stations must be redeveloped to become the core rapid transit hubs of metropolitan areas. These stations must align with best practices in integration, access control, safety, and universal access. They should function as intermodal hubs, linking with non-motorised transport (NMT), minibus taxis, buses, and Bus Rapid Transit (BRT) to support the rail system as the central network. Key functional requirements for stations include after re-development:

- Access control: Implementing secure fare gates and controlled platforms will improve safety, efficiency, and revenue collection.
- Automatic fare collection and equitable access: Introducing Automatic Fare Collection (AFC) across all modes will enable integrated ticketing, reduce transfer penalties, and support equitable access.
- Universal access: Prioritising accessible features like level boarding, lifts, and escalators will ensure inclusive designs for all passengers.

Other essential criteria include capacity, future proofing, intermodal exchange, system approach, sustainability, urban integration, retail and social opportunities, and enhancing the passenger experience. These measures will ensure stations are efficient, sustainable, and user-friendly, supporting rail's role as the backbone of urban transport.

Indicated in Figure 3-2 are the current proposals of the Cape Town Metro for the re-development of Wynberg Station on the Simons Town -Cape Town Line. This is a good example of how PRASA and the municipalities in the three urban commuter networks can work together to enhance Transport Oriented Development (TOD) and use the stations as nodes of urban development.

3.5 Rolling stock

PRASA’s new EMUs are well-suited for modern commuter needs, with appropriate interior layouts, reliability, and a six-car configuration that supports higher-frequency services. However, maintenance remains a concern, with depot upgrades and facilities still lagging. Platform heights are too low for level boarding, requiring raising to ensure universal access and safety, especially for the mobility impaired. In the 2023/24 financial year, 96 EMUs were introduced, replacing most of the old fleet and significantly improving safety, reliability, and efficiency. Worldwide, Automatic Train Operation (ATO) has been introduced as a solution for lighter rail systems, particularly where demand does not justify heavier systems. ATO enhances capacity by replacing human drivers, reducing delays, and enabling shorter headways, more frequent services and, by eliminating train-to-train collisions, allows the use of lighter rolling stock. This lowers capital, energy, and maintenance costs, making ATO an attractive option for new and retrofitted lines, like the proposed Magenta Line in Gauteng where complicated in-and-out manoeuvres from the stations will be required.

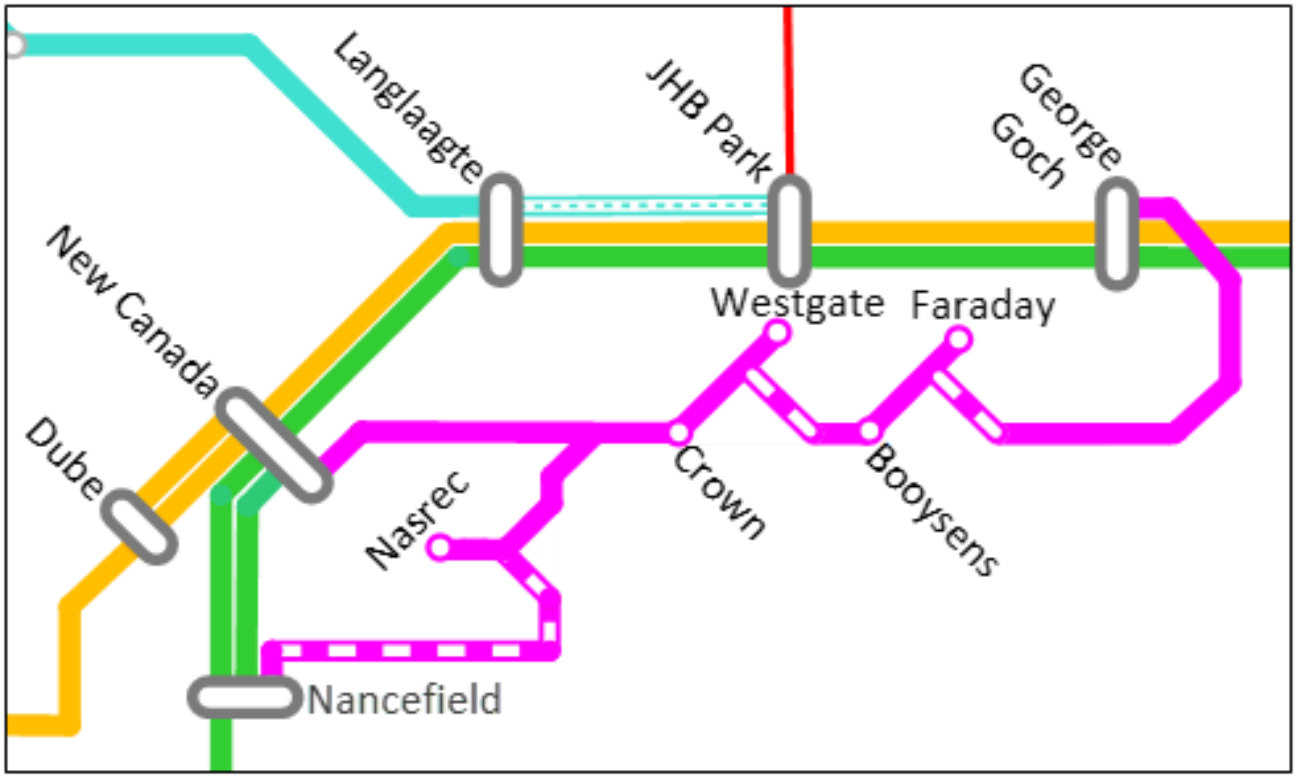


Figure 3-1: The proposed new magenta line in the future Gauteng system

3.6 Contention between Commuter and Freight Trains for Line Capacity

PRASA's network presently handles only 0.05% of current and 0.25% of long-term tonne-kilometres, highlighting its minimal role in freight. Freight activity is concentrated at a few private sidings, with former municipal sidings now defunct. As commuter frequencies increase, the risk of contention with freight grows. South Africa's monolithic rail networks, where freight and commuter trains shared infrastructure, contribute to these challenges. To maintain high-frequency commuter services, freight must be scheduled outside peak hours or separated from metro lines. Clear structural separation between passenger and freight networks is essential, especially in urban areas. Further analysis is needed to identify active sidings and mitigate potential capacity contention. It is now a clear objective to achieve total future separation between the commuter- and freight rail lines in all the urban areas.

3.7 Land Holdings Development

Land holdings development offers a significant opportunity to improve the financial sustainability of South Africa's rail networks. While global leaders like MTR (32.9%) and JR Kyushu (46%) earn revenue from real estate, PRASA's income from rental and lease activities was just 2.9% in 2023/24, with 85.3% of its funding from government subsidies. Nodes served by multiple transit lines like Germiston, Sandton, Bellville, and Durban (among others) present significant opportunities for PRASA to adopt land value capture (LVC) models, reducing reliance on state funding. This would require PRASA to build real estate expertise, form joint ventures, and integrate asset management into its operations. However, historical land claims, customary ownership, and insecure land rights pose significant risks to network expansion and new property developments.

This aspect needs to be driven by the metros and local authorities working with PRASA as is now done by Cape Town. For this reason, the liaison committees in the three areas with commuter rail systems needs to actively pursue joint station or rail reserve developments.

Figure 3-2: Wineberg Station Re-development currently planned by the Cape Town Metro

3.8 Capital and Operational Subsidy

Capital subsidies increased from R4.0 billion in 2010 to nearly R13 billion in 2024 (225%), though four years saw declines, with a low of R700 million in 2021 due to pandemic-related fiscal constraints. A recovery in 2022 saw subsidies rise to R9.7 billion, supporting rail service reinstatement and infrastructure recovery. Operational subsidies grew consistently, more than doubling from R3.1 billion in 2010 to R7.5 billion in 2024 (124%). Moderate increases are expected, with a 4% rise from 2024 to 2025 and 6% from 2025 to 2026, totalling a 10% increase (R800 million) over the next two years, ensuring ongoing government support for operational recovery and service stability.

At the time of writing huge subsidies are allocated to the re-introduction of rail services and the repair of infrastructure that was vandalised during the COVID period. A “normalised” subsidy policy can therefore not be implemented as yet. This aspect will only be It addressed once the urban systems have been restored to the former fully operational status.

3.9 Financial Performance Trends

Recently after the COVID recovery phase gathered momentum, the average fare per passenger kilometre declined by 3%, from R0.33 (2020/21) to R0.32 (2023/24), indicating stable pricing. The average passenger subsidy per passenger kilometre fell by 70%, from R20.74 to R6.18, reflecting improved efficiency and ridership recovery. The cost of a typical passenger trip of PRASA rose from R10.00 (2014/15) to R68.00 (2019/20). The Fare Box Recovery Ratio rose from 1.26% to 3.41%, and the Operating Ratio (measured as the amount of operating expense incurred for every R1.00 of revenue earned) improved by 63%, decreasing from R79.09 to R29.34, signalling better operational efficiency. When operating cost is expressed as a percentage of fare revenue, the Operating Ratio worsened dramatically from 355% (2014/15) to 2 934% (2023/24). Additionally, the labour share of revenue dropped by 63%, from R38.00 (2020/21) to R14.00 (2023/24), showing increased revenue generation without cutting labour costs.

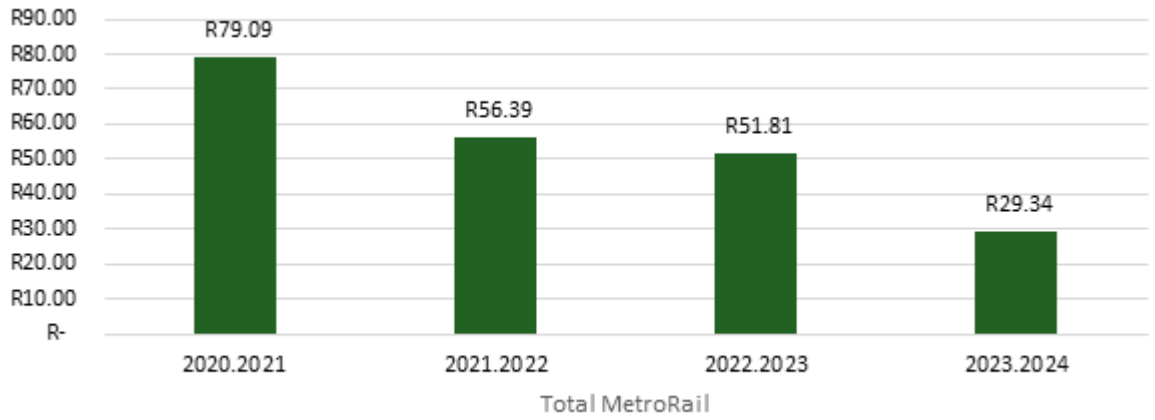


Figure 3-3: Operating Ratio (for every Rx amount operating expense spend, R1 revenue is earned)

3.10 Structural Changes Aimed at Impacting Performance

The NRP introduces key institutional reforms to enhance PRASA's performance. These include the potential concessioning of services and the future devolution of urban rail to municipalities, guided by a national devolution strategy aligned with the Integrated Urban Development Framework. The policy advocates for a dedicated entity to manage rolling stock procurement, leasing, and maintenance, boosting local manufacturing and establishing South Africa as a continental hub. To address funding constraints, PRASA will build capacity to manage complex funding models and engage private sector participation in major projects. While enabling reform, the policy stresses institutional stability during PRASA's recovery programmes.

3.11 Proposed Future Metropolitan Rail Networks

The proposed networks respond to the limitations of existing Metrorail systems. Each metro was reviewed individually to identify priority interventions. While future refinements will rely on demand modelling, the current proposals offer a strategic foundation shaped by the urgency of rapid urban growth and evolving mobility needs.

The following outlines the proposed future rail networks for Gauteng, Cape Town, and eThekwini. Interventions are based on key principles: separating metro services from freight, applying metro design standards, and enabling all lines to operate independently at optimal headways. Strategic branches improve access to townships, infrastructure is upgraded where needed, and new EMUs support faster operations. Tram-trains are considered for lower-volume single-line sections.

Note: The proposed rail network configurations for Gauteng and eThekwini have not yet been subjected to detailed demand modelling and therefore remain indicative at this stage. As such, the configurations represent a preliminary, high-level assessment from an NRMP perspective and are intended as a first iteration. Further refinement should be undertaken through demand modelling and the incorporation of additional data as it becomes available.

Proposed rail network for Gauteng with Gautrain-PRASA integration:

Figure 3-4: Proposed rail network for Gauteng with Gautrain-PRASA integration

Table 3-1: Proposed interventions for the future rail network of Gauteng

Section	Proposal	Rationale
Mabopane to Winterveld	Extend existing double line to Winterveld	Increase ridership by extending the reach of the existing line.
Winternest to Pretoria Noord	Construct a double line next to existing line	Increase capacity to two double lines and enable the independent operation of all lines.
Hammanskraal to Winternest	Construct new double line	Increase coverage by extending the network to unserved northern areas.

Winternest - Saulsville West – Cosmo	Construct new double line	Improve north-south connectivity in the western region, enable Gautrain-Metrorail integration.
Olifantsfontein to Leralla (via Ivory Park)	Construct new double line	Improve network connectivity with a line through Ivory Park and connect Leralla to the north.
Koedoespoort to Mamelodi East	Double existing line, with feeder extension into Mamelodi	Enable independent operation of all lines and increase network penetration into Mamelodi East.
Saulsville to Saulsville West	Extend existing double line from Saulsville	Increase coverage by extending the network into unserved western areas.
Midrand to Leralla	Extend existing double line from Leralla to interchange with Gautrain at Midrand	Enable Gautrain-Metrorail integration and improve east-west connectivity.
Kwesine to Angus	Construct a new double line feeder	Increase network penetration into unserved area of Katlehong.
Kwesine to Zonkeziswe	Construct a new double line feeder	Increase network penetration into unserved area of Katlehong.
Daveyton feeder lines	Extend existing double line to Etwatwa, and extend a feeder northward from Daveyton	Increase network penetration into unserved areas of Etwatwa and north of Daveyton.
Naledi feeder lines	Construct two feeder lines to Naledi	Increase penetration into underserved areas of Soweto.
Krugersdorp to Lenasia (via Naledi)	Construct new double line	Improve north-south connectivity and rail access to unserved high-density settlements in western Gauteng.
Hercules to Hartebeespoort	Reinstate disused line	Extend the current metro network into unserved areas.
Roadbend to Kwatsaduza	Construct a branch line feeder	Provide access to the unserved area of Kwatsaduza.
Nasrec to Nancefield	Construct a new double line connection	Improve connectivity between eastern Soweto and the southern CBD
Langlaagte to Johannesburg	Construct an additional double line parallel to two existing double lines	Increase capacity to three double lines to enable independent operation of all lines.
Germiston West to Germiston South	Reinstate disused PRASA double line	Bypass Transnet line to prevent freight-passenger capacity contention.
Germiston station	Grade separation east of Germiston station	Connect Leralla-Midrand line to Kwesine line through Germiston station, to enable independent operation of Leralla-Kwesine.
George-Goch-Faraday-Booysens-Westgate-Crown-Nancefield-New Canada	Addition of an eastern leg on the Westgate and Faraday branch lines	Create triangular configurations that will allow services from both east and west, which are at present constrained to services from the west only.
Reconfiguration of Lenasia	At Lenasia connect the new line from Naledi with the Vereeniging line; Terminate services on the Light Green Line at Lenasia; Reconfigure services from Oberholzer to Lenasia instead of Midway	Enable the independent operation of the Pink and Brown Line to improve north-south connectivity.

Proposed future rail network for Cape Town:

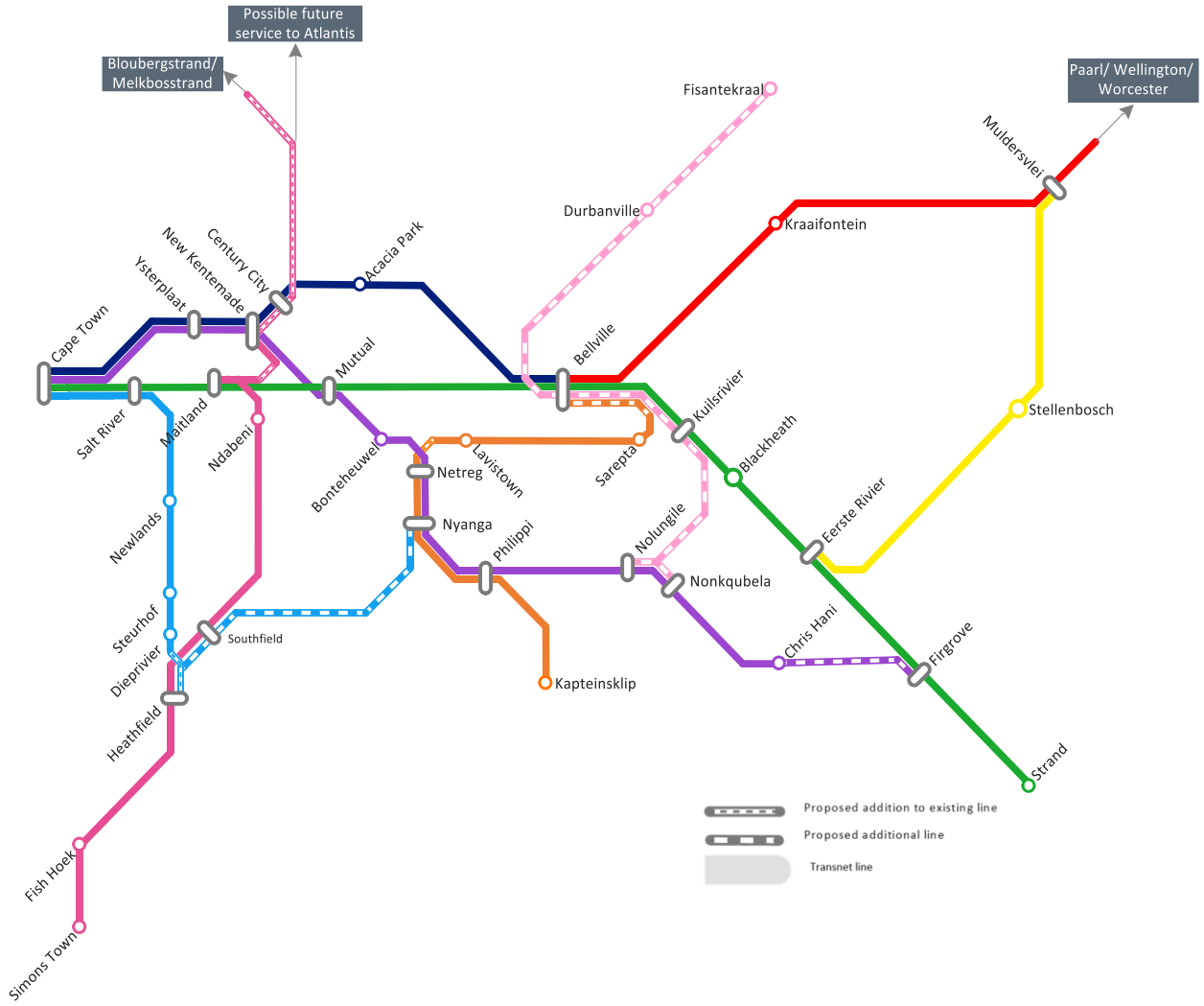


Figure 3-5: Proposed future rail network for Cape Town

Planned interventions for the Cape Town metropolitan rail include the separation of routes so that each line can operate independently without being constrained by intersecting movements or shared track sections. This would include the reconfiguration of junctions, construction of grade-separated overpasses and underpasses, and removal of conflicting service patterns. Under this approach, train frequencies would be determined by the signalling system rather than limitations associated with shared infrastructure, enabling headways of as little as three minutes on core sections of the network.

The long-term network would place greater emphasis on efficient passenger transfers through a high-frequency grid-based system rather than direct end-to-end services across the entire network. Strategic interchange hubs would be developed at locations such as Nyanga, Heathfield, Maitland and Kentemade to support seamless passenger transfers between lines and improve network flexibility.

The proposed network would be structured around the following seven high-frequency lines, each capable of supporting approximately 20 trains per hour per direction:

- Cape Town – Bellville – Strand
- Cape Town – Century City – Bellville
- Kapteinsklip – Bellville
- Simonstown – Heathfield – Maitland – Atlantis
- Nonkqubela – Bellville – Fisantekraal via Blue Downs
- Cape Town – Chris Hani – Firgrove
- Cape Town – Heathfield – Nyanga

The future Cape Town System was modelled in terms of the metro's macro land-use/ transportation model, and it clearly shows that the rail mode will become the backbone of public transport with such a system in place, as graphically indicated below:

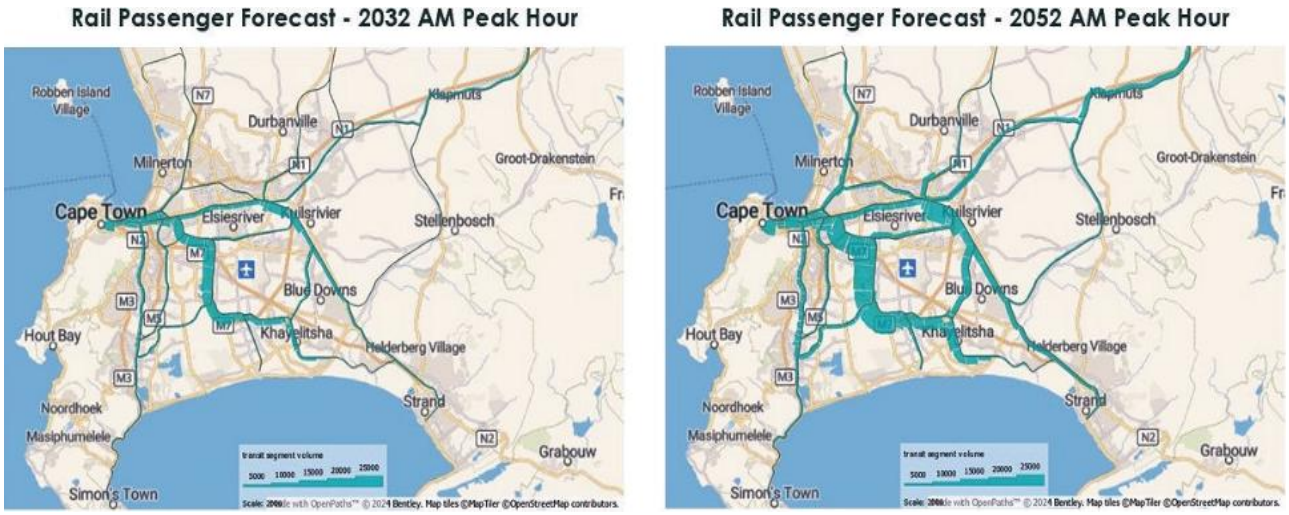


Figure 3-6: Rail Passenger forecasts for the re- configured network.

In conclusion, the reconfigured network supports the following repositioning outcomes:

- A sixfold increase in boardings, from 85 million in 2027 to 515 million in 2052, due to elimination of network entropy, thereby enabling all lines to operate at their designed signalling headway.
- A 24% increase in network efficiency by 2052 due to the greater O-D versatility.
- A 19.4% decrease in average trip length by 2052 due to increased network efficiency.

Proposed future rail network for eThekwini:

Figure 3-7: Proposed future rail network for eThekwini

Table 3-2: Proposed interventions for the future rail network of eThekwini

Section	Proposals	Rationale
Umlazi–KwaMashu/Bridge City	New double line parallel to Effingham line; feeder lines; doubling of Umgeni bridge by adding an additional double track; operating line independently	Remove frequency constraint from lines merging; Increase service frequency; increase network penetration
Kelso–Durban	Additional stations and operate line independently	Expand catchment area and increase service frequency
Cato Ridge–Durban	Triple-track between Rossburgh and Congella; operate in shared configuration with Pinetown line; services to be apportioned according to demand	Remove frequency constraint from merging lines; Increase service frequency
Pinetown–Durban	Extend the double line into Rossburgh; add platform; terminate services at Rossburgh; or construct new elevated double line to Congella	Remove frequency constraint from lines merging; Increase service frequency

Crossmoor–Merebank	Terminate service at Merebank and repurpose as transfer station; add platform; convert to tram-train system; operate line independently	Remove frequency constraint due to lines merging; Increase service frequency; reduce operational and maintenance costs
Wests–Clairwood	Terminate service at Clairwood and repurpose as transfer station; add platform; convert to tram-train system	Remove frequency constraint due to lines merging; Increase service frequency; reduce operational and maintenance cost
Wests–Montclair	Extend double line to Montclair; terminate service at Montclair and repurpose as transfer station; add platform; convert to tram-train system; operate line independently	Remove frequency constraint due to lines merging lines; Increase service frequency; reduce operational and maintenance costs
Stanger–Durban	Additional stations	Expand catchment area; Increase service frequency
King Shaka Airport-Durban (New northern link)	New line east of existing line towards King Shaka airport; alignment either branch from Avoca loop or from CBD along M4	Improved transport connectivity in response to major developments northwards from Durban
Umlazi–Chatsworth (new line)	Extend existing heavy rail line from Umlazi; or extend newly repurposed tram-train line from Crossmoor if demand justifies	Service high travel demand; New source of revenue

3.12 Conclusion

The current performance of urban rail systems in South Africa is hindered by high-entropy networks, inadequate infrastructure, low service frequency, and fragmented integration with other modes of transport. These issues result in inefficiencies that have seen commuter rail lose significant ground to minibus taxis, which now dominate despite offering lower capacity and fragmented networks. To address these challenges, the proposed interventions aim to transform rail into the rapid transit backbone for metropolitan municipalities, with a focus on high-frequency, integrated services that reduce traffic congestion, encourage modal shifts, and decrease greenhouse gas emissions.

The operational recovery of PRASA in 2023/24 is a positive indicator, with significant improvements in service reliability, ridership, and rolling stock availability. However, challenges remain, particularly in integrating rail with other modes and overcoming the legacy of underinvestment and systemic inefficiencies. The proposed development strategy for commuter rail, including reconfiguration of metro networks, separation of freight and commuter operations, and the adoption of high-frequency services, offers a strategic path forward.

The interventions are expected to have a relatively short lead time and modest funding requirements compared to other projects in the NRMP, as many foundational elements are already in place. These improvements will significantly benefit the approximately 20 million people living in urban areas served by PRASA's metro networks. The approach is fundamentally rooted in introducing competition in the urban rail setting, particularly through operating concessions. Given the current structure of South Africa's metro networks, which are characterised by multiple branches, competition should focus on the system as a whole, rather than within individual lines. Reconfiguring the network into independently operated lines, where feasible, can liberate capacity and increase frequency, though careful consideration must be given to the centralised maintenance facilities that currently service the entire network. The interventions proposed in the NRMP are designed to foster competition, while maintaining the integrity and functionality of the rail system.

Ultimately, the strategic development of urban rail, including the integration of new rolling stock, high-frequency services, and operational reforms, will position commuter rail as a central component of South Africa's urban mobility framework. These efforts will not only enhance public transport efficiency but also support broader environmental and economic goals.

4 Long Distance Passenger Rail Overview

4.1 Purpose of the Chapter

This chapter evaluates the historical, current, and potential future role of long-distance passenger rail in South Africa within the broader context of national transport policy and the NRMP's developmental objectives.

4.2 Introduction

Long-distance passenger rail in South Africa is no longer a significant mode of travel for the majority of the population. Once central to inter-city mobility, the network has deteriorated amid shifts in travel preferences, systemic underinvestment in infrastructure and rolling stock, and rising competition from road and air travel. Unlike global trends that prioritise high-speed and regional rapid rail, South Africa's long-distance network remains constrained by unsupportive infrastructure, limited-service coverage, and institutional inefficiencies. The NRP presents a strategic pivot, focusing on demand-led, corridor-based services that prioritise modern standards, freight-passenger integration, and sustainability. This chapter examines how such a model, underpinned by public-private collaboration and regulatory reform, could re-establish long-distance rail as a meaningful contributor to national connectivity and inclusive economic growth in specific selected corridors.

4.3 Current state and Challenges

Scheduled long-distance rail services have effectively ceased to exist for most South Africans. PRASA's Main Line Passenger Services (MLPS), once the backbone of inter-city travel, operated only 40 trips during the 2023/24 financial year, serving just 11 025 passengers nationally, an extremely limited footprint given the size of the country and its dispersed population. Many routes are restricted to occasional charters, disconnected from integrated travel systems. Meanwhile, the Blue Train and Rovos Rail continue operating at low volumes for affluent tourists. The sharp decline in utilisation reflects deep-rooted issues: ageing rolling stock, poor service reliability, journey times that cannot compete with other modes, and an absence of network-wide coverage. Institutional challenges, including operational neglect, a lack of modernisation, and poor financial and strategic oversight, have left long-distance rail largely irrelevant for both everyday travellers and regional development agendas.

4.4 International Trends

Globally, long-distance passenger rail has evolved to high-speed (300km/h and higher) and (160-200km/h) regional rapid transit. Both prioritise competitively priced shorter journey times of up to three hours that compete with road transport and low-cost airlines. Overnight trains are re-emerging for medium-length trips, offering potential for routes like Johannesburg–Cape Town. High speed trains, which are more energy efficient per seat-km than traditional long-distance trains offer climate change benefits. Meanwhile, regional services with 2–3hour journey times are expanding rapidly, highlighting opportunities to extend the benefits of agglomeration of South Africa's cities in links such as Gauteng–Polokwane or Gauteng–Bloemfontein and the towns in between. Many countries also apply a network principle of connecting all provincial capitals to the national capital, an approach that is broadly achievable in South Africa with targeted investment in strategic corridors shared with heavy intermodal trains.

Both of these international trends are restricted to standard-gauge, and the establishment of such systems would thus require significant investment in the new standard-gauge track.

It is unlikely that the high-speed rail option with its dedicated track will become feasible in South Africa any time soon and planning efforts will be towards regional rapid transit, which can also accommodate freight, as further discussed in section 4.6 below.

4.5 Design Considerations

Rail is most efficient when trains run at uniform speeds on purpose-built systems like heavy haul, High Speed Rail (HSR), and metro rail that are incompatible due to differing technical needs, but there is room between these extremes for shared infrastructure. South Africa's long-distance and regional passenger rail future lies in a modern, shared-use standard-gauge high-performance national network that balances the demands of both heavy intermodal and high-speed services. Key design principles include harmonised speeds, strategic separation where necessary, and infrastructure that accommodates both high axle loads and higher-speed passenger operations. Designing for both applications will require compromise, gentle gradients, wide curves, and sufficient clearances. Mixed-use corridors offer a more cost-effective approach than building separate networks, provided that capacity is carefully managed through measures such as long passing loops, double tracking, and modern train control systems. These design choices must support long-term scalability, interoperability, and climate resilience, ensuring that the network is future-proofed and aligned with South Africa's economic, social, and environmental goals.

4.6 Infrastructure and Capacity

Integration between freight and passenger traffic, as suggested above, reduces the capacity required on individual network sectors to handle the sum of freight and passenger traffic on each sector. Their different volumes and speeds will determine network capacity elements such as single or double lines, signalling or train authorisation requirements, facilities for faster trains overtaking slower ones, freight- and passenger handling facilities en-route, as well as terminal facilities for aggregating and disaggregating traffic flows. In principle, for the high-performance standard-gauge national network, traffic flows must be determined first, and capacity design must follow. Capacity of each sector would be based on the relative volumes of automotive-, heavy intermodal- and regional rapid transit services. Due regard must be given to the difference in maximum speeds, 120km/h for automotive and heavy intermodal, and 200km/h for regional rapid transit, requiring combinations of single lines, long passing loops, and double tracks. Given the probable density and mix of freight and passenger trains on South Africa's foundation network, and subject to deeper analysis, it is expected that a standard-gauge network that can support 200km/h maximum with 25+ tonnes axle load, plus sufficient horizontal and vertical clearance, will constitute a competent socioeconomic workhorse railway for the country. This is then the standard-gauge policy that will be pursued in South Africa with ultimately the types of trains that are depicted below:

Figure 4-1: Regional rapid transit utilises short double decker trains to not interfere too much with freight services in the same corridor

The natural reach of metro railways is about one hour or 40km. Beyond that, passenger train speed should increase commensurately with journey distance to maintain acceptably short journey times. This is the domain of regional rapid transit, which serves longer routes at higher speed, within large city-regions or conurbations, or reaching out from them. It may be deployed over a wide range of distances. Within conurbations stations could be 8-10km apart, between towns they could be as far as 80-100km apart. Many systems are rooted in the Central Business Districts (CBDs) of large cities and complement their metro systems to extend the benefits of agglomeration to a wider influence area. Gautrain is South Africa's first application.

A global trend to max out rail journey times at 2-3 hours has resulted in proliferation of regional rapid transit services around the world. For journeys of longer duration, demand progressively shifts to other transport modes. Maximum speed is in the range 160km/h to 200km/h, or perhaps slightly higher under favourable topographic conditions. For 200km/h maximum, average speed will be ≈150km/h, enabling a reach of ≈450km in three hours. Regional rapid transit applications typically share infrastructure with other trains, in many instances freight trains. They are frequently of double-deck design, to maximise passenger capacity within each train slot. For this reason, as well as for stability at high speed, they require standard-gauge track. A double deck train is also shorter than a single deck train, which has line capacity advantage when sharing infrastructure with other trains.

Contemporary regional rapid transit trains are multiple units, frequently of four cars each, which may be coupled together to meet larger capacity requirements. They are powered by overhead electrification, diesel or, in recent times hydrogen, a fuel that is approaching commercialisation.

In South Africa, regional rapid transit will introduce a new era of long-distance rail travel to fill the void left by the demise of traditional long-distance passenger trains. With a natural reach of around 450km, regional rapid transit potentially connects, for example, Gauteng to provincial capitals Bloemfontein, Kimberley, Mbombela and Polokwane; Newcastle to Durban and Gauteng; and Cape Town to Beaufort West. As the fastest land transport mode by far, it will once again attract road-to-rail shift in the medium distance mobility market.

It is also possible to operate regional rapid transit trains over longer distances. Individual passengers would not necessarily travel the entire distance, many would use shorter, overlapping portions of the end-to-end route that suit their particular mobility needs.

Figure 4-2: Double stacked container trains are typically the type of freight trains that will share the standard-gauge corridors with regional rapid transit

4.7 Long-distance and High-Speed Rail Service Development

Mainline Passenger Services (Shosholoza Meyl)

MLPS has prioritised the Johannesburg–Queenstown route in 2024/25, offering two trips per month and extra services during the festive season. Other routes, including Komatipoort, Gqeberha, Cape Town, Durban, and Musina, will be reintroduced as constraints are addressed.

Over the next couple of years, feasibility studies will be conducted to explore introducing a mix of Premier Classe, Tourist, and Sleeper coaches on the Johannesburg to Cape Town and Durban routes, depending on their performance and ability to cover variable costs. Contract trains for events, such as those on the Durban route, will also be considered using the same principles. To reduce fixed costs, MLPS plans to integrate with Metrorail for operational staff and Autopax for sales offices. Further integration with Autopax for feeder and distribution services is also planned, supporting the vision of a single long-distance entity which leverages the strengths of each mode while improving service quality and offering the most effective solution for long-distance travel. From an NRMP perspective, PRASA will explore the possibility of concessioning lines for long-distance services, which will be a key focus. The market will be tested to evaluate the availability of other operators to improve train operations on all lines.

Priority HSR and RRT corridors

The focus is on routes where rail can deliver high-performance services, supporting both regional rapid transit and heavy intermodal operations. Three potential HSR or RRT corridors based on extensive analysis, the Government has decided to prioritise through a multi-criteria analysis in the High-Speed Rail Corridor Framework, based on their ability to link major economic centres and support regional development. These are:

- Gauteng–eThekwini: A high-speed link could cut travel time and improve tourism. It would be a dedicated high-speed line for 300+ km/h operation, for implementation when South Africa’s economy has developed sufficiently to support the requisite investment.
- Gauteng–eMalahleni–Mbombela: Extends Gauteng’s benefits of agglomeration to Mbombela, supports tourism to Kruger National Park and stimulates economic activity in Mpumalanga province.
- Gauteng–Polokwane–Musina: Extends Gauteng’s benefits of agglomeration to Polokwane, strengthens rural–urban integration and positions the corridor for future connection to the African Integrated High Speed Rail Network.
- Gauteng-Bloemfontein: links the capital of the Free State with the industrial heartland of the country. It will also be the first link in establishing the automotive corridor with the harbours of the Eastern Cape.

The proposals are major long-term investments with the potential to transform transport, though final alignments may diverge from existing networks to optimise efficiency and meet infrastructure needs. Demand forecasts will be strengthened through advanced modelling tools, including calibrated logit models and integrated socioeconomic and transport network data, ensuring evidence-based decision-making.

4.8 Operational Subsidy Trends

Internationally, the prevailing trend, excluding Japan, is for governments to subsidise socially important or commercially unviable long-distance rail services. The key takeaway for South Africa is the need to ensure subsidies are used efficiently to maximise value for tax-payers money.

4.9 Capital Investment Trends

Global trends highlight a shift towards modernisation, while South Africa's outdated model suggests a need to reorient investment towards a contemporary standard-gauge network. RRT would depend on heavy intermodal infrastructure, meaning that capital investment in the shared network would benefit both freight and RRT services, with RRT reliant on the infrastructure provided. This is then the vision that will direct rail planning in the near future.

4.10 Land Holdings Development

Land holdings development will play a limited role in funding high-speed rail and regional rapid transit in South Africa, as these systems require minimal infrastructure. While some airspace above stations or depots may be developed, most land used for these systems will be acquired specifically for their purpose, and existing land holdings will not contribute significantly to their funding.

The re-development of stations along the future rapid rail transit corridors will thus be a functional part of those corridors in terms of operational requirements.

4.11 Conclusion

South Africa's long-distance and regional passenger rail future lies in a modern, shared-use standard-gauge high-performance national network that balances the demands of both heavy intermodal and high-speed services. The introduction of standard-gauge on key corridors, will reposition rail as a credible alternative to long-distance road travel.

5 Policy and Funding Frameworks for Rail Reform

5.1 Introduction

This chapter consolidates the national and international policy environment that underpins the Draft NRMP, providing a strategic framework for South Africa's rail sector development. It defines the legislative parameters, roles, and strategies that guide planning, investment, governance, funding, subsidy mechanisms, safety management, and sector transformation. The chapter ensures that the NRMP is fully aligned with broader national and developmental objectives, setting a coherent foundation for revitalising the country's rail system to serve as the backbone of integrated transport.

5.2 Strategic Policy Framework and Key Deliverable Policies

5.2.1 Strategic Policy Frameworks

Rail subsidy policy in the draft NRMP is structured to address market failures, affordability constraints, and historical inequalities, while promoting operational efficiency and sustainability. International and domestic experience demonstrates that rail systems cannot fully recover operating and capital costs through fare revenue alone. As such, public subsidies are required to sustain operations and fund infrastructure investment.

South Africa's policy vision seeks to reposition rail transport as the preferred mode of land transport, anchoring the integration of other transport modes. Achieving this requires strategic interventions guided by a robust policy framework, including:

- White Paper on National Transport Policy (2021): Provides overarching guidance across all transport modes.
- White Paper on National Rail Policy (2022): Addresses specific challenges within the rail sector and proposes solutions.
- Roadmap for the Freight Logistics System (2023): Focuses on interventions to optimise freight movement.
- National Land Transport Act (2009) and Amendment Act (2023): Define institutional and regulatory frameworks.
- Draft National Public Transport Subsidy Policy (2024)[4]: Aims to shift South Africa from mode-specific subsidies (bus/rail) to a, unified, user-focused, and, efficient, system. Key proposals include, linking subsidies to, performance-based contracts, funding, municipal, transport plans, and, increasing, sector, funding, to 5% of GDP.
- African Union Parameters: Advocate for standard-gauge rail to support heavy and rapid transit needs.

These frameworks collectively define the institutional, regulatory, and delivery framework required to restore rail as a competitive, efficient, and sustainable mode of transport. The policy further recognises alignment with African Union objectives, including the development of standard-gauge rail systems to support regional integration and high-capacity transport corridors.

The overarching policy intent is to:

- Enable modal shift from road to rail.
- Improve logistics efficiency and reduce transport costs.
- Expand equitable access to mobility.
- Support environmental sustainability and long-term economic growth.

5.2.2 Key Deliverable Principles

The national rail delivery framework establishes the policy basis for implementing structural reforms and infrastructure investment across the rail sector. Key delivery principles include:

[4] Although in draft format the NPTSP has been gazette in February 2024 and it has been confirmed that as of 2026 the document is a work in progress and that it is being amended after the consultation process for submission to Cabinet.

- Open Access and Market Reform: The policy mandates non-discriminatory third-party access to rail infrastructure, enabling multiple operators to utilise the network under regulated conditions. This creates a competitive operating environment while maintaining infrastructure as a strategic national asset.
- Private Sector Participation: Policy requires the active mobilisation of private sector investment in rail infrastructure and operations, reducing fiscal pressure on the State while improving efficiency and innovation.
- Competition and Market Structuring: Competition is to be promoted both "in the market" (between operators) and "for the market" (through competitive tendering and concessions), ensuring improved service delivery and cost efficiency.
- Institutional Restructuring: The rail sector is to be restructured through vertical separation between infrastructure management and train operations, with potential further separation into infrastructure owners, infrastructure managers, and operators.

These delivery policies establish a transition from a state-dominated, vertically integrated system to a regulated, competitive, and integrated rail system.

5.3 Rail Subsidy Policy

Subsidies are crucial to creating sustainable, accessible, and efficient rail systems for both passenger and freight services. The proposed subsidy frameworks reflect international best practice and seek to address historical inequalities and inefficiencies. Overall, passenger rail policy emphasises:

- Accessibility and affordability.
- Integration across modes.
- Alignment with land use and economic development objectives.

5.3.1 Role of Passenger Rail

Passenger rail policy establishes a hierarchical system of services to support urban mobility, regional connectivity, and long-distance travel.

- **Commuter Rail** is designated as the backbone of metropolitan public transport systems, providing high-capacity, affordable mobility for urban populations. Commuter rail policy directives include:
  - Integration with municipal transport networks.
  - Alignment with spatial planning and housing development.
  - Prioritisation in public transport investment strategies.

- **Regional Rapid Transit** services are intended to:
  - Extend labour market access across metropolitan and peri-urban areas.
  - Support economic integration between cities and surrounding regions.
  - Facilitate densification and agglomeration economies.

- **High-Speed and Long-Distance Rail** is positioned as a long-term policy objective to:
  - Provide efficient intercity connectivity.
  - Reduce reliance on road and air transport.
  - Support low-carbon transport solutions.

5.3.2 Passenger Rail Subsidies

Passenger rail subsidies are framed as a social and developmental policy instrument, with the following core principles:

- User-Targeted Subsidies: Subsidies are directed at low-income households to ensure that transport costs do not exceed affordability thresholds (e.g. a defined percentage of income).
- State Ownership of Strategic Assets: Infrastructure and rolling stock remain publicly owned to reduce barriers to entry and ensure long-term system stability.
- Competitive Contracting of Operations: Train operations are to be competitively tendered to improve efficiency and service quality.
- Municipal Allocation and Management: Subsidy funding is to be allocated to municipalities based on integrated transport plans, with local authorities responsible for administration and performance oversight.

- Integration with Land Use and Transport Systems: Subsidy frameworks prioritise integration with other transport modes and alignment with housing and urban development programmes.
- Performance Monitoring: Subsidies are subject to monitoring and evaluation to ensure accountability and alignment with policy objectives.

In summary, the passenger rail subsidy policy represents a shift from fragmented subsidy regimes toward a targeted, performance-based, and integrated funding model.

5.4 Freight Rail Subsidies

5.4.1 Role of Freight Transport

Freight rail policy defines rail as the primary mode for high-volume, long-distance transport within the national logistics system. The Freight Logistics Roadmap emphasises that efficient logistics systems are central to economic performance and that rail must provide safe, efficient, and cost-effective services aligned with national development objectives. The NRMP freight transport policy positions freight rail to:

- Transport bulk commodities and containerised freight efficiently.
- Support export competitiveness and industrial development.
- Reduce logistics costs across the economy.
- Alleviate congestion and deterioration of road infrastructure.

Policy further requires:

- Prioritisation of strategic freight corridors (e.g. bulk export and container corridors).
- Integration with ports, terminals, and intermodal facilities.
- Migration of appropriate freight volumes from road to rail.

5.4.2 Freight Rail Subsidies

Freight rail is therefore positioned not only as a transport mode but as a core economic enabler within national industrial and trade policy. Key freight rail principles include:

- Infrastructure-Focused Subsidies: Public funding is directed primarily toward infrastructure investment, rather than operational support, to avoid market distortion.
- Limited and Targeted State Support: Government intervention is focused on addressing infrastructure backlogs and supporting economically significant corridors.
- Access Charge Framework: Private operators contribute to infrastructure costs through regulated access charges, creating a sustainable revenue stream for network maintenance and expansion.
- Promotion of Private Sector Investment: Private sector participation is encouraged in rolling stock provision and operations, reducing the financial burden on the State.
- Regulatory Oversight: Economic regulation ensures fair pricing, prevents excessive profits, and maintains competitive neutrality.

The freight subsidy framework reflects a market-enabling approach (ensuring freight rail remains competitive), supporting infrastructure while preserving operational competition. Simultaneously. The policy is supportive of broader economic connectivity without over-reliance on ongoing government support.

5.5 Funding Regimes for Rail Development

5.5.1 Funding Regime Premises and Policy Principles

Rail infrastructure worldwide faces the dual challenge of high capital requirements and funding gaps exacerbated by limited fare revenues. South Africa's funding model addresses fragmentation, underfunding, and lack of innovation by learning from international best practices. With the preceding as background, the funding regime for rail development establishes the policy framework through which financial resources are mobilised, allocated, and governed to support the sustainability and expansion of the rail sector. The policy recognises rail infrastructure as a strategic public asset with significant economic, social, and environmental spillover benefits, which cannot be fully captured through direct user charges.

Accordingly, the funding framework is premised on the principle that rail investment constitutes a public good with long-term national returns, requiring sustained and predictable public sector support, complemented by private sector participation where appropriate. The policy further distinguishes between:

- Funding (the ultimate source of revenue, including public budgets and user charges).
- Financing (the mechanisms used to raise capital upfront).
- Investment (the allocation of resources to specific projects and programmes).

This distinction ensures clarity in policy design and supports the development of a coherent and sustainable financial architecture for the rail sector. The funding regime is guided by the following overarching policy principles:

- Long-term fiscal sustainability and affordability.
- Efficient allocation of public resources.
- Transparency and accountability in funding flows.
- Alignment with national development, spatial, and environmental objectives.
- Leveraging of private sector participation without compromising public interest.
- Differentiation between passenger and freight rail funding models.

5.5.2 Rail Funding Policy Position

The policy acknowledges that rail systems are structurally characterised by:

- High upfront capital investment requirements.
- Long asset lifecycles and slow capital recovery periods.
- Revenue limitations, particularly in passenger rail, where affordability constraints restrict fare levels.

As a result, rail systems globally operate with structural funding gaps, particularly in relation to infrastructure provision and maintenance. The policy therefore establishes that:

- The State bears primary responsibility for funding rail infrastructure, given its public good characteristics and economy-wide benefits.
- User charges (fares and access fees) should contribute to cost recovery where feasible but are not expected to fully fund system costs.
- Cross-subsidisation mechanisms may be applied where appropriate, particularly within integrated transport systems.
- Predictability and stability of funding allocations are essential to enable long-term planning and investment.

The policy further recognises that fragmented and short-term funding allocations undermine system performance. It therefore mandates the development of multi-year funding frameworks, aligned with national budgeting processes and infrastructure planning cycles. In this context, rail funding is not treated as discretionary expenditure, but as a strategic investment in national economic infrastructure.

To ensure long-term sustainability, the policy promotes:

- Lifecycle-based funding approaches, incorporating maintenance and asset renewal.
- Investment in high-demand corridors to maximise impact.
- Integration of rail funding within broader public transport financing strategies.

Passenger rail funding is therefore positioned as a core component of public service delivery, rather than a stand-alone transport expenditure.

5.6 Passenger and Freight Rail Funding Policy

5.6.1 Passenger Rail Funding Policy

Passenger rail funding is expressly framed as a social and economic policy instrument, aimed at ensuring affordable mobility, supporting spatial transformation, and enabling inclusive economic participation.

Core Funding Structure

The policy establishes a funding model comprising:

- Public funding of infrastructure and rolling stock, ensuring long-term asset control and system stability.
- Operational funding through subsidies, bridging the gap between fare revenue and the cost-of-service provision.
- Municipal planning and allocation, ensuring that funding is aligned with integrated transport plans and local mobility needs.

This structure reflects the principle that passenger rail services deliver significant positive externalities, including reduced congestion, improved access to employment, and environmental benefits.

Funding Policy Directives

Passenger rail funding must adhere to the following policy directives:

- Equity and Affordability: Funding allocations must prioritise services that support low-income households and reduce the proportion of income spent on transport.
- Integration with Land Use and Transport Planning: Funding decisions must be aligned with spatial development frameworks, transit-oriented development (TOD), and integrated public transport networks.
- Performance-Based Allocation: Funding is to be linked to measurable service delivery outcomes, including reliability, safety, coverage, and passenger volumes.
- Decentralised Implementation with National Oversight: While municipalities are responsible for planning and implementation, national government retains oversight to ensure consistency, compliance, and fiscal discipline.

Institutional Funding Flows

The policy supports the rationalisation of existing grant mechanisms (such as operating and network grants) into a more integrated and streamlined funding framework. This includes:

- Consolidation of funding streams to reduce fragmentation.
- Alignment of conditional grants with municipal transport plans.
- Strengthening of financial governance and reporting requirements.

This approach is intended to improve efficiency, reduce duplication, and ensure that funding is directly linked to policy outcomes.

5.6.2 Freight Rail Funding Policy

Freight rail funding is governed by a fundamentally different policy approach to passenger rail, reflecting its commercial orientation and revenue-generating potential.

Core Policy Position

The policy establishes that:

- Freight rail operations should be commercially viable and largely self-sustaining.
- Public funding should be targeted and limited, focusing primarily on infrastructure.
- Market mechanisms should be preserved to ensure efficiency and competitiveness.

Public sector involvement in freight rail funding is concentrated on:

- Development and maintenance of strategic infrastructure (e.g. heavy-haul corridors, intermodal terminals).
- Addressing historical underinvestment and infrastructure backlogs.
- Supporting network expansion where there are clear economic benefits.

This reflects the recognition that freight rail infrastructure delivers economy-wide benefits that justify public investment.

The policy further mandates increased private sector participation through:
- Concession agreements.
- Open access arrangements.
- Private investment in rolling stock and terminal infrastructure.

Private operators are required to pay regulated access charges and comply with operational, safety, and performance standards. This model ensures that operational risk is transferred to the private sector, while the State retains control over strategic infrastructure.

5.7 Further Considerations

5.7.1 Safety and Security Management

Rail safety policy mandates the implementation of comprehensive Safety Management Systems (SMS) across all rail operations. All rail operators are required to:
- Obtain safety permits from the Railway Safety Regulator (RSR).
- Implement SMS frameworks compliant with SANS 3000-1 and national legislation.

In terms of policy, the SMS must:
- Identify, assess, and mitigate operational risks.
- Establish standardised safety procedures and protocols.
- Ensure continuous monitoring and improvement of safety performance.

Safety is treated as a non-negotiable policy requirement, forming the foundation for all rail operations. Furthermore, security policy recognises the increasing threat of theft, vandalism, and sabotage within the rail sector and establishes a structured framework for managing security risks whereby security management is integrated into the broader SMS framework but distinguished by the intentional nature of security incidents and the requirement for criminal justice and enforcement responses. Security policy emphasises the need for:
- Advanced and innovative security interventions.
- Risk-based approaches such as layered protection systems (LOPA).
- Continuous improvement beyond minimum regulatory requirements.

With regards to security, operators are required to:
- Develop and implement Security Management Plans.
- Protect critical assets and infrastructure.
- Implement surveillance, monitoring, and response systems.

Security management is therefore positioned as a strategic operational priority, essential for system reliability and investor confidence.

5.7.2 Special Needs Passengers

The policy establishes universal accessibility as a core principle of passenger rail planning and service delivery. Therefore, key requirements include:
- Design of infrastructure and rolling stock to accommodate persons with disabilities.
- Integration of accessibility standards into all new and upgraded rail systems.
- Alignment with constitutional rights and national transport policies.

Accessibility is framed not only as a compliance requirement but as a fundamental policy objective to ensure equitable access to mobility.

5.7.3 Unlawful Occupation of Rail Reserves

Unlawful occupation of rail reserves is identified in the NRMP as a critical policy challenge affecting safety, operations, and infrastructure integrity. Such occupation poses significant risks to life, property, and transport operations and further compromises the safety of both occupants and rail users.

The NRMP policy on unlawful occupation of rail reserves requires:

- Alignment with existing legislation such as the Prevention of Illegal Eviction from Unlawful Occupation of Land Act (PIE).
- Consideration of legislative amendments to address rail-specific challenges.
- Development of standard operating procedures by rail entities.

The NRMP supports interventions that are:

- Lawful and constitutionally compliant.
- Coordinated across government entities.
- Supported by alternative housing solutions where required.

5.8 Conclusion and Recommendations

South Africa's rail reform, driven by the NRMP and aligned national policies, offers a blueprint for building a modern, equitable, and efficient rail system that underpins national development.

Key recommendations include:

- Policy Alignment: Ensure consistency across all levels of government for integrated transport planning.
- User-Targeted Subsidies: Promote affordability and operational efficiency.
- Private Investment: Encourage private participation through open access and concessions.
- Municipal Oversight: Empower municipalities to administer transport subsidies transparently.
- Safety, Security, and Accessibility: Enforce rigorous standards for operational excellence.
- Address Unlawful Occupation: Implement coordinated legal strategies to protect rail assets.

Successful implementation will position rail as a critical enabler of economic growth, social inclusion, and environmental sustainability for South Africa's future.

6 Public Transport Policy

6.1 Purpose of the Chapter

This chapter evaluates the mode of Rail Transport as an element of Public Transport primarily in the metropolitan urban centres of South Africa.

6.2 Introduction

Road congestion in the country's metropolitan areas is increasing relentlessly. Peak hour travel time is on average double that of the off-peak. People are consequently changing their travel behaviour and those who are able shift their daily activities to travel outside the peak hour, a phenomenon known as peak spreading.

Metropolitan populations will experience further significant growth over the next decade, as a result of economic growth and urban migration, which will increase travel demand and car ownership, especially in the major metropolitan areas of Cape Town, eThekwini and Gauteng. Although future road plans do exist, they cannot keep up with increasing travel demand, and funding for their implementation is limited. If current trends continue, the road network will be unable to accommodate traffic growth, resulting in worse congestion and ultimately in gridlock. Furthermore, travel demand immediately before and after peak periods will also increase, resulting in longer congested periods that make peak spreading impossible. High congestion levels and long travel times negatively impact economic growth and commuters' quality of life.

2037 AM peak hour City of Johannesburg
Average Speed = 10km/h

Need for non-road based public transport

Figure 6-1: Output from the GRRIN macro-model, which emphasised the need for rail public transport.

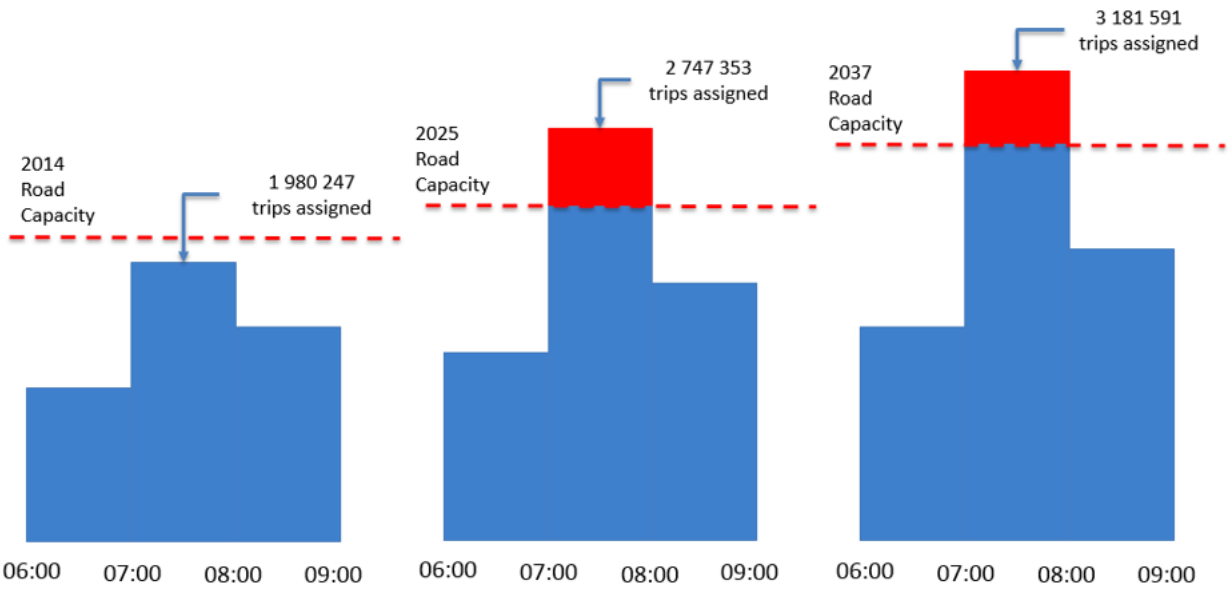


Figure 6-2: GRRIN Model showing the need for further peak spreading.

6.3 International Trends

Global socio- economic drivers and technological advances have substantially broadened Urban Guided Transit's (UGT) solutions spectrum. Transport Planners, in developing solutions for urban guided transit, do not presently have access to the full spectrum of technical solutions available i.e., heavy metro, automated light metro, automated guided transit, monorail, light rail and BRT. Failure to appreciate available technical solutions may lead to sub-optimum investment. Furthermore, metropolitan Integrated Transport Plans (ITPs) have a five-year horizon, making it challenging to include long-term assets, such as rail in these plans.

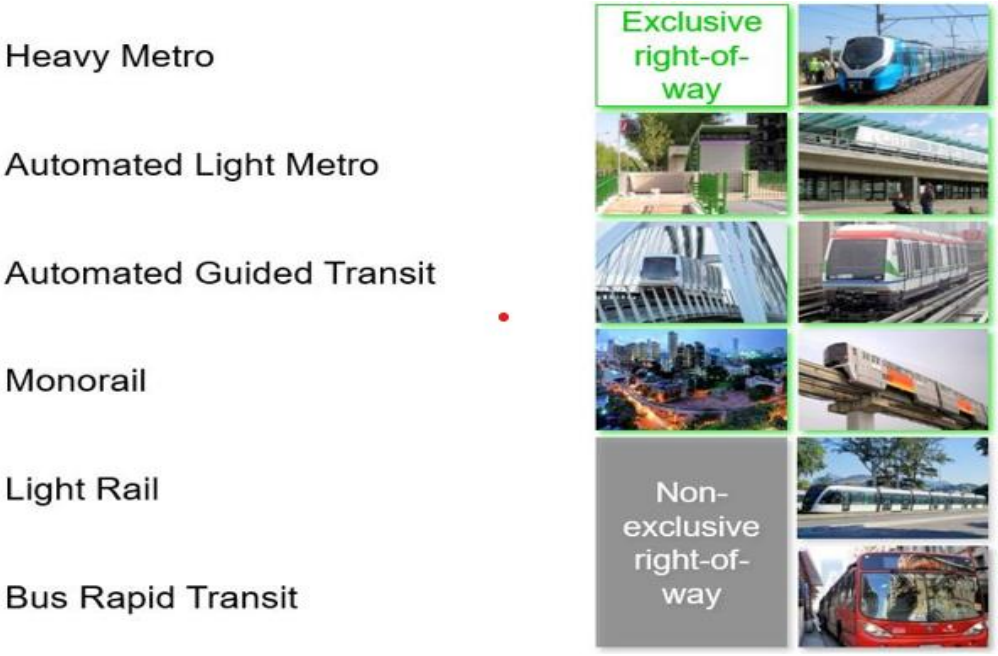


Figure 6-3: Of the types of urban rail systems available on heavy rail is in use in South Africa

6.4 Policy

The government acknowledges that substantially enhanced UGT capacity is one of the most pressing transport problems currently confronting it. Where the current urban rail network does not yet reach, and a need for rail services arises, municipalities should also consider the development of lighter rail applications.

The most appropriate UGT mode or sub-mode should be deployed to optimally align public transport solutions with transport demand in each urban corridor. In developing such solutions, Transport Planners must therefore consider the full spectrum of available UGT solutions. Government will ensure that there is sufficient flexibility in guiding policy and strategy documents, as well as in grant frameworks supporting the development and operation of public transport, to allow municipalities to viably and sustainably consider the implementation of the full spectrum of UGT modes.

Where UGT is indicated and shown to be feasible and sustainable, local authorities should plan for the sub-mode with highest appropriate capacity to form the backbone of their Integrated Transport Plans in consultation with the DoT's National Rail Planning Office Where UGT modes are to be implemented, they shall be planned to support integration by existing services to maximise the network value of the investment.

In accordance with the National Land Transport Act and NDP provisions, it states that transport functions be assigned to the most appropriate sphere of Government, the DoT will, together with provincial governments where necessary, proactively identify capacity gaps within the metropolitan municipalities, if any.

Government recognises PRASA's substantial commitments to the recovery of the network and the recapitalisation of the commuter rail fleet, and that the recovery phase requires a stable setting.

Noting however that intolerable road congestion may require acceleration of UGT investment before completion of PRASA's present recapitalisation commitments, requests from metropolitan municipalities for assignment of the urban rail function to them will be considered sympathetically. This acceleration will enable them to increase the contribution of rail-based UGT capacity to their Comprehensive Integrated Transport Plans.

The lighter UGT sub-modes Light Rail, Automated Light Metro, Automated Guided Transit and Monorail are not present in the country, so no sphere of government has experience thereof. Nevertheless, to exploit all opportunities for urban guided transit, the sub-modes shall, as for BRT, be included in the planning endeavours of the Comprehensive Integrated Transport Plans at the metropolitan level. This policy position intends to provide opportunities for building rail and UGT capacity in local government. Where appropriate and necessary, they should use Public-Private Partnerships (PPPs) to concession routes, transfer technology and develop skills.

6.5 The Rationale for an Urban Rail Investment Strategy

As outlined in Chapter 3 of this document, there is a growing accumulation of issues that require substantive intervention to enable urban rail to recover from its decline and to prepare for the future envisaged by the NRMP. As a reminder, and to provide context to what follows, the following fundamental issues are inherent in the three large existing metropolitan rail systems:

- Service frequencies are too low to provide a backbone service competitive with on-demand service by minibus taxis.
- Network coverage has not kept up with population development.
- Network configuration cannot support maximum capacity on all lines simultaneously.

The foregoing issues are independent of PRASA's general decline and the aftermath of the pandemic. They receded into the background as latent issues during PRASA's decline and now its recovery with suppressed demand. But when the replacement signalling systems have been commissioned and all new EMUs have been delivered and systems are able to operate normally, the former overcrowding problems, which were present in 2012 before the decline began, will return, this time with greater intensity due to the now larger population.

The proposals to address the foregoing challenges include, briefly, network reconfiguration, extensions to existing lines, additional lines, feeder lines to enhance coverage in townships and probably additional rolling stock. However, Chapter 3 has only addressed the services and technicalities that should underpin positioning of commuter rail as the backbone of metropolitan public transport: It has not addressed the modalities of implementation.

Given the impending challenge of a return to overcrowded trains, the constrained state of the fiscus, and the government's predisposition to private sector participation, there is synergy in packaging the entire issue and its solution as a massive Investment Strategy via large-scale integrated concessions for each of the three large metropolitan municipalities.

The following section reports on a funding model that could support large scale investment in urban rail in South Africa, however, is subject to formal forthcoming policy directives. Note that it is used in China and India to plant new metros in cities: Applying it in South Africa to position its present dysfunctional urban railways as proper metro systems would not be dissimilar. The models applied in China and India is depicted in the following figure:

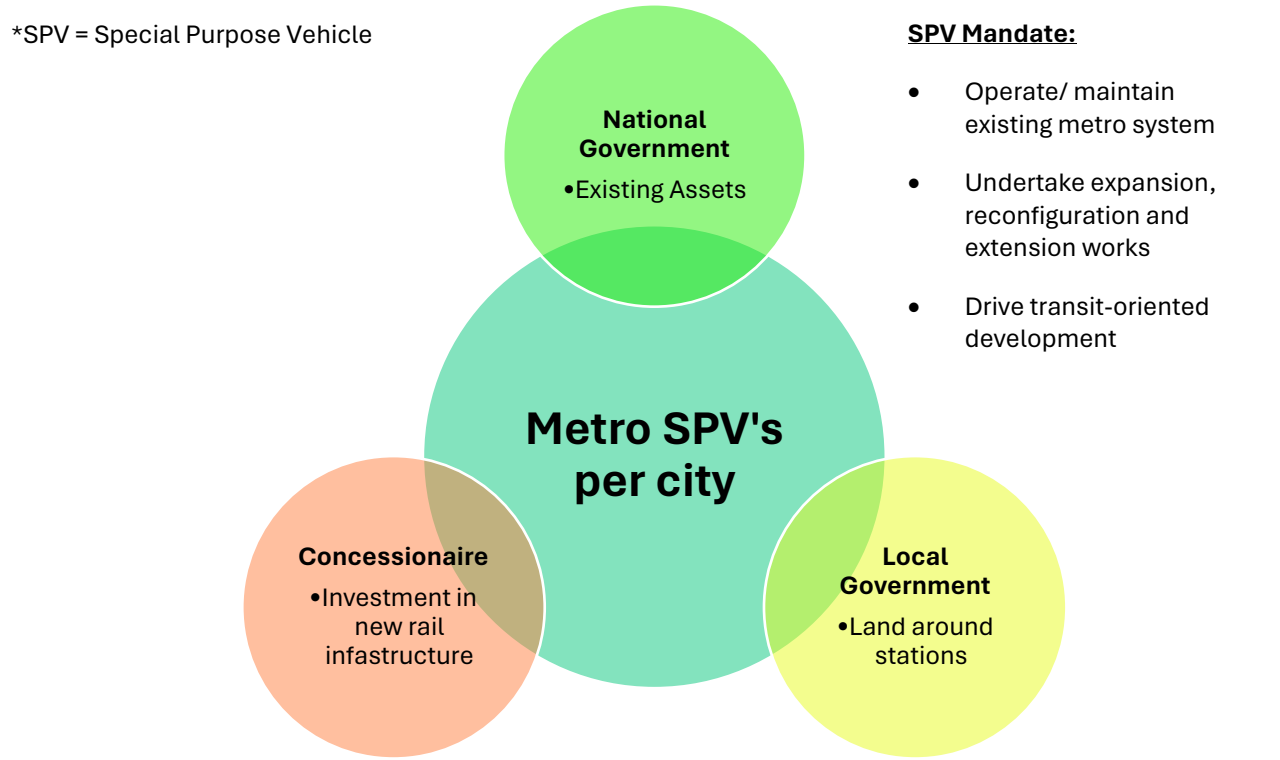


Figure 6-4 Metro Investment Arrangements

6.6 International Examples

The number of cities worldwide with urban rail systems has been increasing rapidly in recent years, at a rate of more than four per year. China and India are leading the field. They provided several important pointers for a possible future urban rail investment dispensation in South Africa. While China and India differ in detail, the underlying principles are roughly aligned. No distinctions between them are made in what follows.

- Local government plays a dominant role, but not exclusively so, national government establishes an urban rail development framework, and local governments in cooperation with sub-national governments request participation.
- National and sub-national governments fund up to ≈40% of capital costs, but the remainder must come from other sources, such as the local authority's land contribution, the concessionaire's capital contribution and banks that are willing to lend against local authority property holdings as security.
- The basic financing principle is government should provide infrastructure, but users must pay for operating costs SPV's are created at local government level with various contributions by and shareholdings of national, regional and local government.
- A major local government obligation is to provide right of way for the rail system and land for construction of depots and transit-oriented development.
- The concessionaire's remuneration comprises the rights to collect fares and earn income from development of land in and around the rail system that he operates.
- Very reduced or even zero borrowing costs allow for the fast tracking of new urban rail systems and the extension of existing systems.

- SPVs collaborate with national and sub-national governments as well as private sector participants to establish entities that facilitate regulatory approvals and project execution.
- The essence of the foregoing bullets is that governments do not want ongoing commitments to subsidies so their commitment is an up-front capital contribution, Local authorities do not want to risk dependence on operating subsidies, so the concession must be structured to be self-funding in that regard.
- Metro fares are kept low to attract higher ridership and passengers from across the income spectrum, this encourages a high proportion of the population to remain public transit users rather than switch to private cars even as incomes increase.
- Local government is responsible for providing or procuring access to stations, whether by NMT, feeder systems or any other means because it, as sponsor, takes the revenue risk for the system.
- Current Private Sector Participation (PSP) best practice is to invite bids to deliver all outputs for an entire metropolitan rail system. The longer the concession period the more investment will be made by the concessionaire in the specific system.

7 Rail Market

7.1 The Purpose of the Chapter

Government sets out its policy position to revitalise South Africa's rail transport system, guided by the NRMP and the White Paper on NRP (2022). South Africa will transition towards a high-performance national rail network based on a minimalist standard-gauge approach, supported by targeted interventions across freight and passenger rail. This policy framework prioritises resolving operational inefficiencies, strengthening financial sustainability, and addressing structural constraints within the rail sector.

7.2 Introduction

The roles of Transnet, PRASA, Gautrain, and local authorities are defined to support the future rail system. Private sector participation, modernisation, and the economic impact of rail investment are prioritised. By 2050, the system will be transformed through infrastructure investment, network rationalisation, and alignment with changing economic and logistics needs. This NRMP outlines the key policy directions and strategic interventions.

7.3 Strategic Rail Network and Transition to the NRMP

A central policy priority is the transition to a high-performance, standard-gauge national rail network. This will be achieved through the construction of new standard-gauge lines and, where feasible the conversion of existing Cape-gauge infrastructure. By 2050, the national rail system will be largely standardised to ensure that rail services, particularly freight, remain competitive in the face of growing road transport demand. However, Cape-gauge will continue to serve urban areas in major metropolitan regions, with some heavy-haul operations possibly retaining Cape-gauge if economically justified.

Network rationalisation is prioritised to ensure long-term sustainability. This includes the closure of unprofitable lines, the development of new lines aligned with evolving economic patterns, and the maintenance of a network capable of adapting to future demand. Transition arrangements between the current and future network configurations will be actively managed, informed by the TFR traffic file, Rail Addressable Market (RAM) analysis, and operational considerations to better align rail's capabilities with currently unserved market segments, particularly high-value, low-density, time-sensitive freight presently carried by road hauliers.

A critical challenge is the declining revenue base from traditional heavy-haul operations, particularly coal and iron ore, which have sustained the rail freight system since the mid 1970's. Anticipated reductions in demand by the by the 2030s necessitate a more diversified and sustainable rail business strategy. Accordingly, heavy-haul corridors will be managed to maintain viability, while enabling entry into higher-growth market segments, including high-value, time-sensitive freight. This transition will support a meaningful shift from road to rail, enabled by the performance characteristics of a standard-gauge network.

Provision is also made for increased private sector participation to strengthen competitiveness and reposition rail as an effective operator in both heavy-haul and intermodal freight markets.

7.4 Restore rail as Backbone of South Africa's Logistics and Mobility System

Standard-gauge Phase 1 provides for the development of a compact, approximately 2 700km network aligned to the highest demand freight corridors. In line with the Pareto principle, approximately 20% of the rail network carries around 80% of the country's passenger and freight demand. A relatively small number of strategic corridors, particularly those linking ports, industrial zones, metropolitan areas and logistics hubs, therefore account for the majority of rail traffic, value and growth potential.

The future growth of rail volumes in South Africa is expected to be concentrated on this core 20% of the network, outside of the dedicated heavy haul export lines. As a result, the primary focus of the NRMP is to improve the competitiveness, efficiency and service quality of these high-demand corridors. This has informed the

identification of strategic corridors for standard-gauge conversion, either through new standalone standard-gauge infrastructure, partial conversion using dual-gauge arrangements, or targeted new construction where feasible.

The proposed standard-gauge Phase 1 network is therefore configured to capture the overwhelming share of heavy intermodal freight that is best suited to rail, by both volume and value, while also creating opportunities for Train Operating Companies to introduce regional rapid transit and higher-speed passenger services where demand exists. Together with the Eastern and Western Minerals networks, as well as the remaining core and feeder network elements, this approach restores rail to its role as the backbone of South Africa's land transport system.

Note however that although the national network in total covers all high-volume routes, the value contributed by the two minerals networks is comparatively low, as represented by the almost invisibly feint blue lines in Figure 7-2. Provision is therefore made for the introduction of private sector participation in these minerals networks to enhance efficiency and performance. This approach is intended to leverage private sector expertise in managing the pit-to-port systems effectively and efficiently, as well as its capacity to align output with demand through sustained, long-term capital investment. The RFI process has confirmed strong market interest and has informed a clear implementation pathway for private sector participation. It is expected to lead to a workable, mutually beneficial outcome. A structured framework will be adopted to enable efficient pit-to-port operations, align production with market demand, and support sustained capital investment in the logistics system, ensuring improved performance and long-term viability.

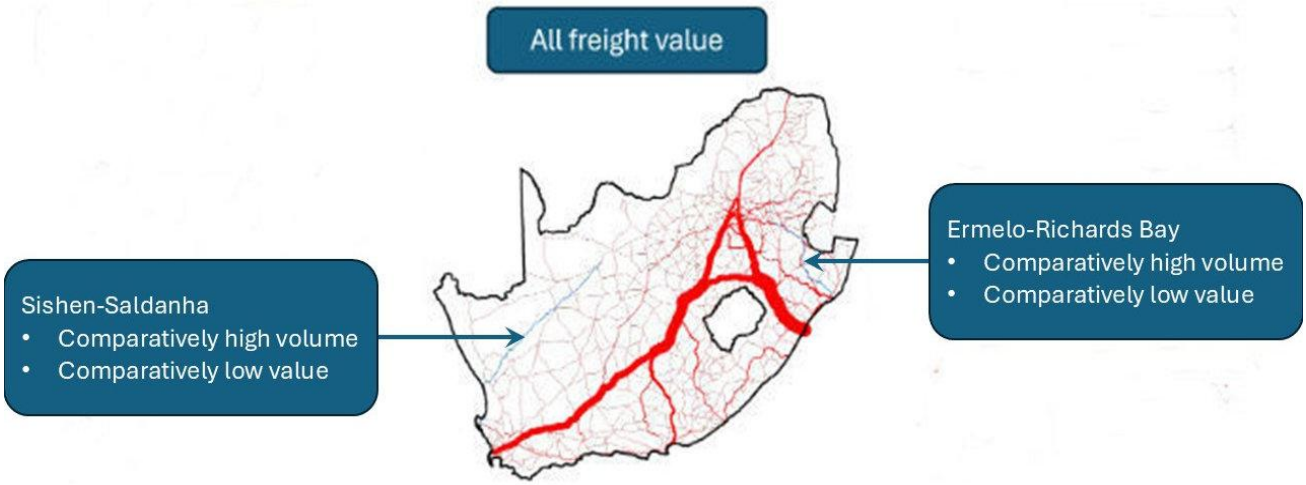


Figure 7-1: Comparative values of road freight (red) and bulk minerals (blue) logistics in South Africa

Rail's strength as a transport mode lies in its ability to deliver heavy, fast and high-capacity service. The foregoing positioning statements reflect this principle; they neither address short lines nor exclude them. The overall outcome will be a more efficient and environmentally sustainable rail system.

7.5 Freight Rail: Enhancing Competitiveness and Private Sector Involvement

TFR operates a vast network of rail corridors, including core mineral export routes and branch lines. The national freight rail system faces significant competition from road transport, which has resulted in a dramatic shift of freight volumes from rail to road. To reverse this trend and enhance rail's competitiveness, the Government has prioritised a number of key initiatives, including the migration of freight to containerised transport, the adoption of double-stacking, and the introduction of fast services.

Branch lines, which generally offer limited commercial potential, may hinder the overall competitiveness of the long-distance network. Provision is therefore made for the systematic evaluation and rationalisation of these lines to ensure that the efficiency of the broader rail system is not compromised. Where justified, certain branch lines may be closed, repurposed, or reconfigured, while others could be revitalised through targeted intervention.

Private sector participation is enabled as a key mechanism to support the management and development of selected corridors, particularly where it can improve operational performance and financial sustainability.

This approach is intended to enhance efficiency, promote innovation, and mobilise the capital investment required to upgrade and sustain branch line infrastructure.

Moreover, the future of South Africa's rail network will depend on the development of cross-border connections and the African Integrated High-Speed Rail Network. These initiatives are recognised as critical to advancing regional integration, facilitating trade, and unlocking emerging freight opportunities across the African continent.

7.6 Passenger Rail: Modernisation and Expanding Urban Mobility

PRASA, which operates Metrorail's commuter services, faces ongoing challenges related to aging infrastructure, security concerns, and underinvestment.

Provision is made for the continued use of Cape-gauge for urban rail networks in major metropolitan areas, supported by targeted expansions and network reconfigurations to address historical overcrowding and to meet growing demand. In smaller cities, such as Buffalo City and Nelson Mandela Bay, differentiated rail solutions may be pursued in response to specific demographic, spatial and economic needs. Priority is given to increasing network capacity, improving service reliability, and enhancing station infrastructure. This includes increasing service frequency to enable serving a substantially larger number of origin-destination pairs and introducing new technologies to support operational efficiency and integration. Measures include the introduction of automated fare collection systems to enable multi-modal service integration, facilitate fare integration, support targeted subsidy mechanisms, and to promote equitable access across all public transport modes within metropolitan areas.

The passenger rail network is positioned to respond to evolving urban mobility patterns and will contribute to reducing congestion, lowering emissions, and expanding access to affordable transport, particularly for lower-income communities. Effective collaboration between national and local authorities, together with private sector participation, is recognised as essential to the future development and sustainability of urban rail systems in South Africa.

7.7 Economic Impact and Long-Term Sustainability

Investment in South Africa's rail infrastructure is expected to yield substantial economic benefits, particularly in terms of job creation and broader economic growth. An estimated R50 billion investments in rail are projected to generate a total economic impact of approximately R189 billion, creating jobs across various sectors, from construction to operations. The revitalising of the rail network is further expected to reduce logistics costs as a percentage of GDP, making South Africa's economy more competitive and efficient.

The economic impact of rail is not limited to freight, passenger rail also contributes significantly to social equity by providing affordable mobility, particularly for lower-income households. Rail can enhance access to essential services, such as healthcare and education, while reducing the environmental footprint of urban transport systems. The continued investment in rail will be key to achieving broader sustainability goals and improving the quality of life for South Africa's citizens.

The scale of investment required is estimated at over R1.9 trillion over a thirty-year period but the economic rationale is equally compelling. When considered in aggregate, the evidence strongly suggests that the scale of benefits outweighs the costs of investment.

The projected R1.9 trillion in capital expenditure (CAPEX) over a ten-year period is substantial, equivalent to approximately 2.6% of national GDP. Yet the economic multipliers associated with this spending are high. For every R1 million invested, the economy stands to gain approximately R4.35 million in GDP, alongside the creation of eight full-time equivalent jobs and an increase of R4.38 million in household income. Over the projected investment cycle, this equates to more than R 2.1 trillion in direct GDP contribution and more than 7.2 million employment opportunities across the construction and operational phases.

Beyond the direct investment phase, systemic benefits reinforce these gains. The restoration of the rail system enables a modal shift of at least 60 million tonnes of freight from road to rail, saving South African businesses an estimated R 26.6 billion per annum in direct logistics costs. Additional indirect savings from reduced congestion, accidents, emissions, land way, noise and policing costs are valued at approximately R12.8 billion per annum, bringing the total potential annual economy-wide benefit of freight rebalancing to nearly R40 billion.

On the commuter side, efficiency gains translate into lower household expenditure on transport, time savings, accident reduction, and improved accessibility for low-income communities. In Cape Town alone, modelling suggests savings in the order of R7.78 to R9.26 per vehicle kilometre, with time savings valued at R42.57 per hour. These benefits support labour market access, productivity, and inclusive urban development, with broader spillovers into spatial transformation and climate change mitigation.

Commuter rail savings are based on detailed modelling exercises, such as EMME. For the NRMP, such modelling has not been undertaken. Nevertheless, based on recent modelling undertaken for the City of Cape Town, it transpired that the range of savings directly related to kilometres (fewer kilometres travelled by road-based transport) vary between R7.78/km and R9.26/km. Savings that are likely to occur as a result of travel time savings in Cape Town amount to 42.57/hour. The combined services vary between R11.74/km and R21.89/km.

7.8 Future Outlook and Recommendations

A transition to a contemporary, efficient, and sustainable rail network by 2050 is envisaged. This includes the adoption of standard-gauge infrastructure, particularly for heavy intermodal operations, and a continued focus on public-private partnerships to boost investment in rail services.

- Investing in Standard-Gauge Infrastructure: The national rail network will transition to standard-gauge by 2050, with investments in new infrastructure and the conversion of existing lines. While Cape-gauge will remain in urban areas, heavy-intermodal operations will be actively managed to ensure efficiency, competitiveness, and alignment with the future network architecture.
- PSP: Private sector investment and participation are recognised as critical to improving efficiency, enhancing service delivery, and boosting infrastructure development.
- Rationalising Freight Rail Networks: The network will be rationalised based on current and future traffic volumes, with a focus on high-density and high-value corridors. Branch lines with limited commercial viability should be repurposed or closed.
- Modernising Passenger Rail: The passenger rail system will modernise, with an emphasis on expanding capacity, improving safety and reliability, and using technology to enhance the customer experience.
- Sustainability and Adaptation: Rail networks should be adaptable to changing economic conditions, including the closure of unprofitable lines and the introduction of new services to meet emerging market needs and unfulfilled existing needs.

Stakeholder engagement is recognised as essential, particularly with provincial and municipal authorities, to ensure that decisions relating to rail line closures, concessions, and investments are transparent and take into account broader social and economic impacts.

The implementation of these priorities will result in the development of an efficient, sustainable, and economically viable rail network capable of meeting the demands of the future.

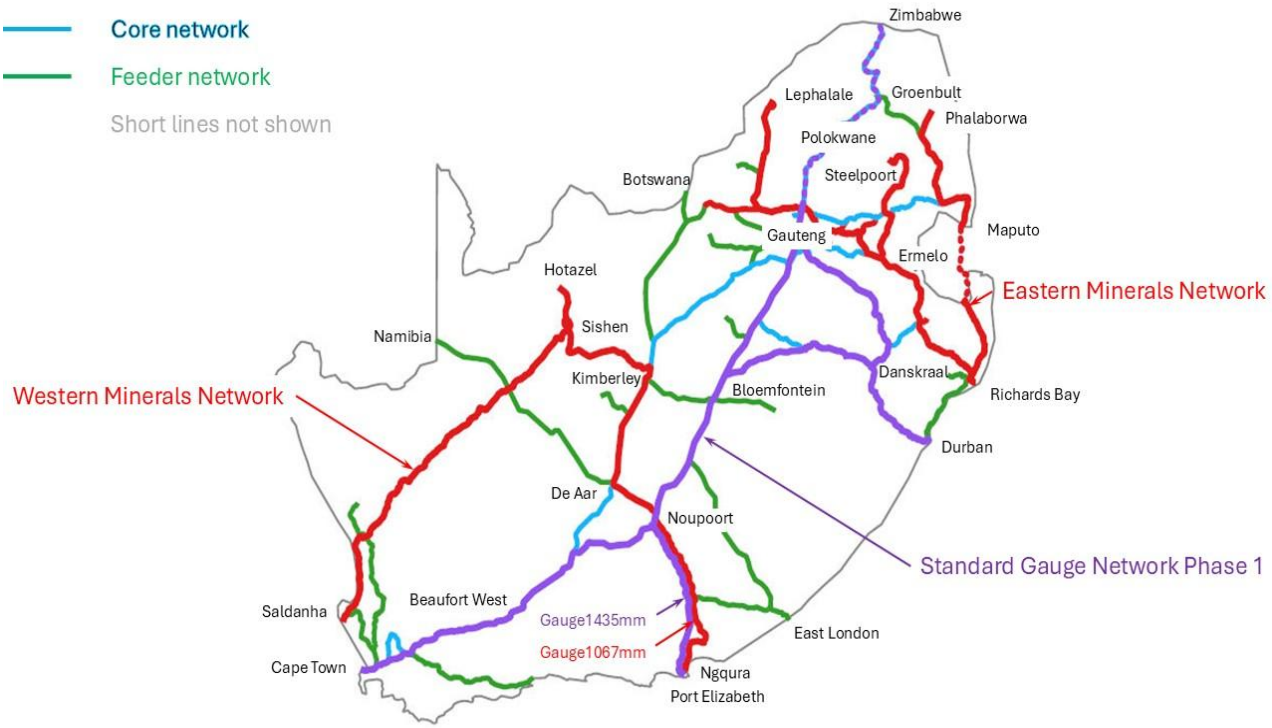


Figure 7-2: Map of Future Rail Network segmented by function

The map reflects the NRMP classification of core network (blue), feeder network (green). Metro systems are not visible at the small scale of the map, and there should be no traffic between them and the rest of the network, so they have also been omitted.

The red lines show two networks in mineral-rich areas where failure to develop integrated pit-rail-port solutions has forced heavy freight onto roads that were not designed for such loading, thereby damaging them and increasing logistics costs. They are elements of the existing 1 067mm Cape-gauge network with potential for upgrading performance by accentuating the heavy haul axle load and train length genetic technologies, in collaboration with integrated pit-to-port planning, investment and operation. The figure therefore does not distinguish between 30 tonnes/axle on Sishen-Saldanha, 26 tonne/axle on Ermelo Richards Bay, and 20 tonnes/axle on the rest of the network. These corridors are grouped to reflect their strategic importance and their suitability for private sector participation: The DoT has recently issued a request for information to gauge the private sector's interest in participating in opportunities on these networks.

As narrow-gauge railways, these corridors are inherently constrained in their ability to achieve the performance levels associated with standard-gauge systems. The only comparable railways in the world are the Central Queensland Coal Network that exports coal at 26 tonnes/axle on 1 067mm gauge under a 99-year lease, and Brazil's Vitória-Minas Railway that exports iron ore at 27 tonnes/axle on 1 000mm gauge under a recently renegotiated concession until 2057. Notwithstanding these constraints, both systems demonstrate stable performance and effective stakeholder alignment.

The purple lines show Phase 1 of a 1 435mm standard-gauge high-performance national rail network. It is designed to enable rail to address two latent opportunities in the national transport task that narrow-gauge railways cannot address at all. The first is the movement of high-volume, high-value, long-distance intermodal freight between ports, industrial areas, inland logistics hubs and metropolitan markets. The second is the provision of faster regional rapid transit and higher-speed passenger services between major cities and urban regions.

8 Infrastructure Statement

8.1 Purpose of the Chapter

This chapter sets out the policy direction for restoring, sustaining, modernising and expanding South Africa's rail infrastructure so that the network can support reliable, safe, efficient and future-ready freight and passenger services.

8.2 Introduction

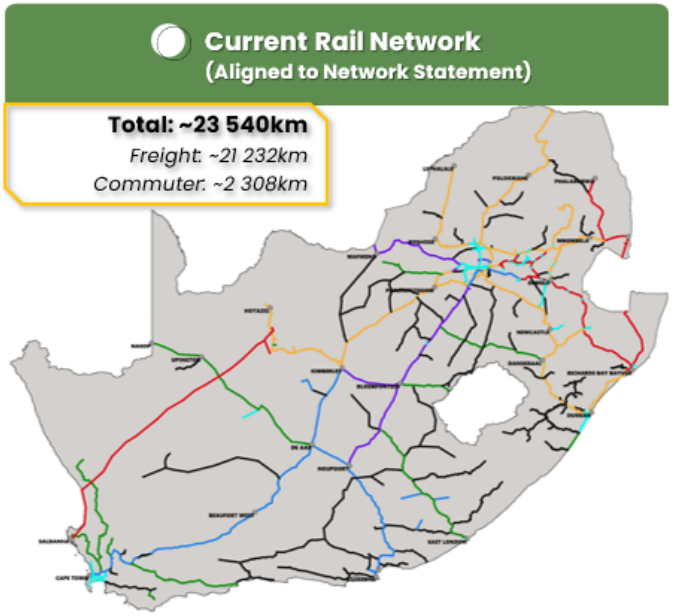
This chapter takes a grounded approach, acknowledging the deterioration and fragmentation that define much of the current network, while laying out a pragmatic yet forward-looking roadmap for restoration, renewal and enhancement. This chapter emphasises that without long-term investment in, and diligent application of best-practice maintenance of the network's backbone, including track, signalling, telecommunication systems, power, and structures, South Africa cannot achieve the reliable, demand-responsive, and commercially viable rail services it envisions for the future.

8.3 Strategic Context

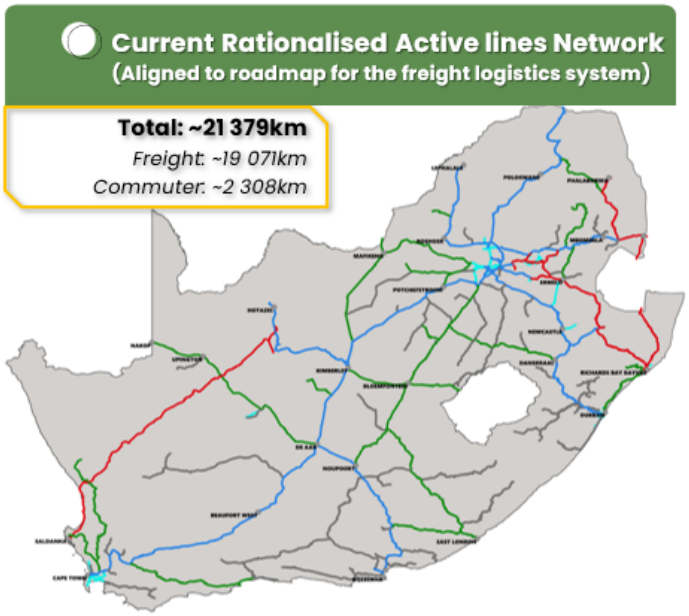
South Africa's rail network has been weakened by prolonged underinvestment, deferred maintenance, theft, vandalism and fragmented operations. This has reduced reliability, constrained capacity and limited the ability of rail to support freight logistics, commuter mobility and broader economic activity.

In this context, the NRMP adopts a rationalised and corridor-based view of the network. This recognises that the current railway system must be understood in terms of its changing condition, present operational reality and future strategic role. Rationalisation is therefore not only a response to deterioration, but also a planning tool to prioritise recovery, direct investment and align the network with long-term national transport and economic objectives.

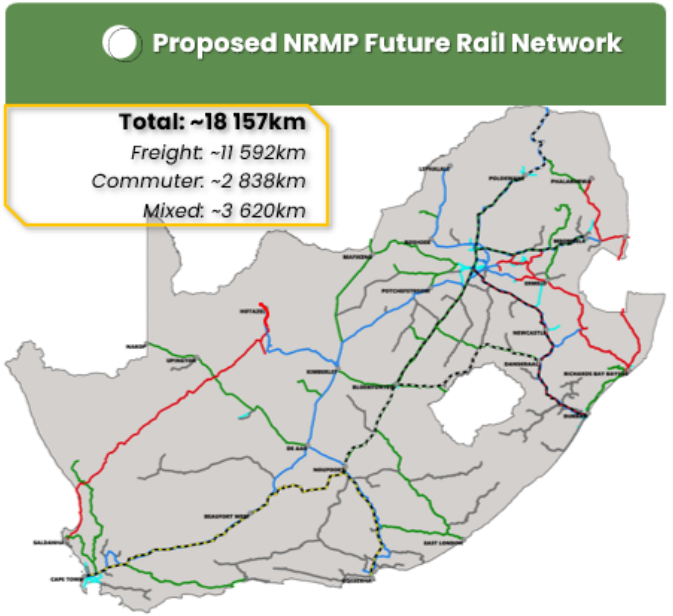
The Figure 8-1 below brings together three related but distinct views of the railway network that are currently available in the public domain, and places them in a strategic sequence. The left-hand figure reflects the network information presented in Transnet's Network Statement including passenger rail. The middle figure shows the rationalised active rail network published through the Freight Logistics Roadmap, including passenger rail. The right-hand figure sets out the strategic intent of the NRMP, illustrating the future railway network envisaged for South Africa as part of a longer-term recovery, modernisation and restructuring trajectory.



Legend	Name	Length	Gauge	Type
	Bulk BMC	~2 405km	NG	Freight
	BMC Dependent	~3 717km	NG	Freight
	Core (CFN)	~1 960km	NG	Freight
	Key Redundancy	~990km	NG	Freight
	Feeder (FRS)	~3 261km	NG	Freight
	Ringfence (B-network shortlines)	~8 899km	NG	Freight
	PRASA (Track-km) - NG	~2 228km	NG	Commuter
	Gautrain - SG	~80km	NG	Commuter



Legend	Name	Length	Gauge	Type
	Bulk BMC	~2 405km	NG	Freight
	CRN	~4 818km	NG	Freight
	Feeder	~5 316km	NG	Freight
	Short lines	~6 532km	NG	Freight
	PRASA (Track-km) -NG	~2 228km	NG	Commuter
	Gautrain - SG	~80km	NG	Commuter



Legend	Name	Length	Gauge	Type
	Bulk (BMC)	**~2 485km**	NG	Freight
	Core (CRN) Total	**~5 140km**	NG/SG	Mixed
	CRN Narrow Guage	*~1 520km*	*NG*	*Freight*
	CRN Standard Gauge (Total)	*~3 620km*	*SG*	*Mixed*
	CRN Dual Gauge	*~1 075km*	*SG*	*Mixed*
	CRN High Speed	*~647km*	*SG*	*Mixed*
	CRN RRT	*~989km*	*SG*	*Mixed*
	Remaining SG	*~909km*	*SG*	*Mixed*
	Feeder (FRS) - NG	**~4 491km**	NG	Freight
	Shortlines - NG	**~3 203km**	NG	Freight
	PRASA (Track-km) – NG	**~2 612km**	NG	Commuter
	Gautrain - SG	**~226km**	SG	Commuter

Figure 8-1: Various Stages of the Network

8.4 Asset Management Philosophy

Rail infrastructure shall be managed through a life cycle based, risk-informed and value-driven asset management system aligned to ISO 55001 principles. This is intended to direct limited resources to the assets and interventions that deliver the greatest value, while balancing cost, risk and performance and supporting safety, reliability, resilience and long-term sustainability.

The asset management framework shall be founded on four principles, value, alignment, leadership and assurance, and shall be supported by an asset management policy, a strategic asset management plan and discipline-specific asset management plans. Figure 8-2 illustrates how policy, planning, implementation and continual improvement should align within a structured asset management system.

Decision-making shall take account of safety, route criticality, environmental impact, remaining asset life, whole-life cost, budget constraints and resilience to weather and climate change. This is necessary to support differentiated interventions across the network, improve reliability, reduce avoidable failures and strengthen the basis for funding and renewal decisions. The approach should be implemented through proactive maintenance, structured risk management, data-driven decision-making and sustainability-led interventions.

The system shall cover permanent way, civil structures, electrical systems, train authorisation systems and telecommunications. Risk management shall be embedded across planning, design, maintenance, renewal and operations, supported by a corporate risk matrix, structured risk registers and prioritised mitigation actions, to strengthen governance and support the shift from reactive to preventive and predictive asset management.

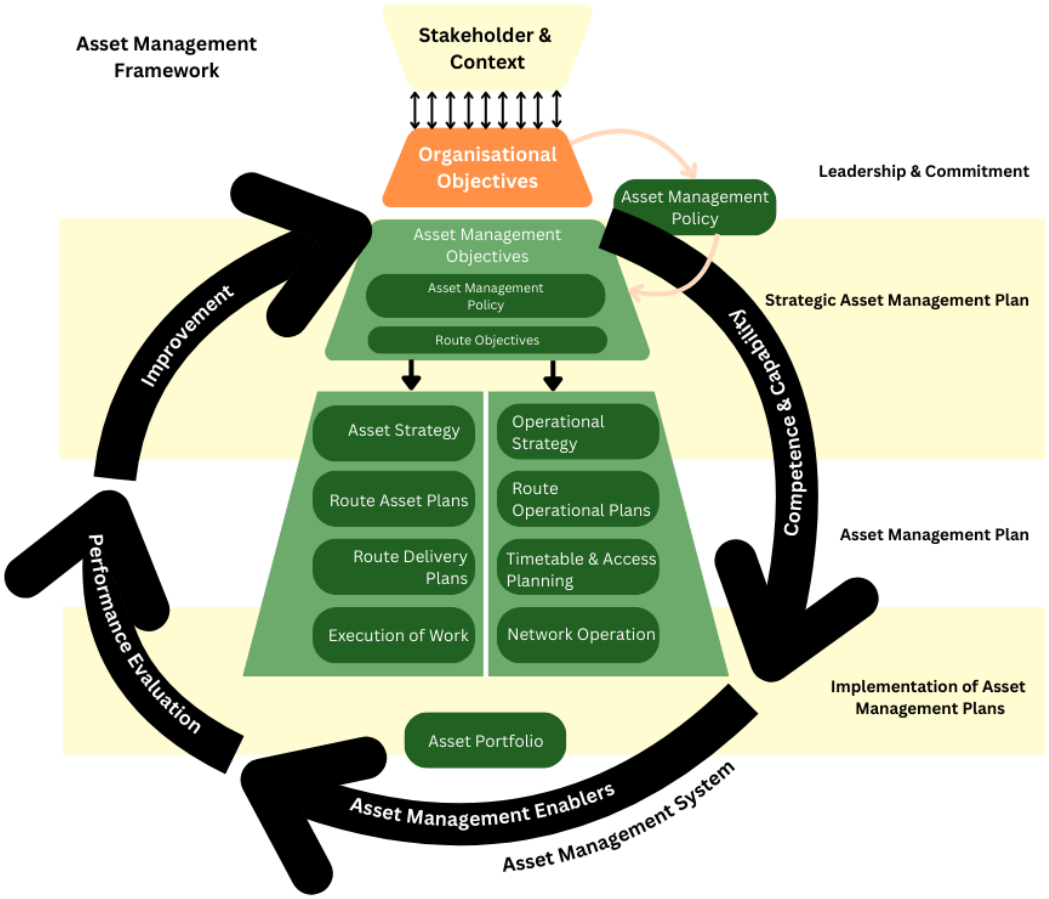


Figure 8-2: Scope of a rail network Asset Management System

8.5 Sustaining and Restoring the Network

Sustaining and restoring the rail network requires a focused programme to return infrastructure to practical design condition, eliminate maintenance and renewal backlogs, and direct resources to those sections where intervention will deliver the greatest operational and economic benefit. This includes improved use of mechanised maintenance, compliance with maintenance standards, better availability of critical materials and equipment, and faster procurement and approval processes.

This work should be guided by the intended role of each corridor and route in the future network. Decisions on whether assets are maintained, renewed, reinstated or upgraded should be aligned with network strategy and informed by condition assessment, service demand and expected return on investment. Restoration should also support modernisation through the replacement of obsolete infrastructure, transition to digital systems, use of electronic interlocking and smart tools, and adoption of more resilient materials and technologies.

Security is included in this section because restoration cannot be sustained where theft, vandalism and sabotage continue to degrade infrastructure and disrupt operations. Table 8-1 therefore sets out the main levers required to protect network assets and support reliable train service. These include guarding, target hardening, theft-resistant design, technology deployment, intelligence gathering, partnerships with law-enforcement and communities, faster incident response, and stronger internal security capability. Together, these measures are intended to improve monitoring, reduce hotspot activity and protect critical infrastructure.

Table 8-1: Levers for security improvement (Source: Transnet)

No	Lever	Note
1	Deploy security guards & improve their effectiveness	Deploy security guards in the interim
2	Target hardening – difficult to reach	Safeguard the assets that are attractive to thieves with stronger protective enclosures and locks.
3	Design out components that are prone to theft	Replace copper cables with other cables that are not attractive to thieves. (e.g. contact wire replace with copper magnesium)
4	Deploy Technology	Digitisation of processes, drones, cat-eye, intrusion detections etc.
5	Information gathering/ business Intelligence	Information gathering on cable theft syndicates, predictive analysis, crime patterns, profiling
6	Partnership with external security stakeholders	Partner with stakeholders such as SAPS, SSA, Defence, CSIR for security support. Priority committees established by SAPS (ferrous and non-ferrous metals & ports of entry)
7	Community partnerships	Letters to Public Works 'Rail Sector EPWP Programme," employment of locals in projects in those communities, community awareness
8	Improve Response Time to theft Incidents	Optimal stationing, deployment and enabling of technicians
9	Internal security capacitation	Fill critical vacancies within the security organisation

Sustaining the network also depends on people capability. Appropriate technical skills, leadership and training are required to support maintenance delivery, security response and a high-performance culture. Network restoration is therefore not only an infrastructure priority, but an institutional one, requiring aligned investment in assets, systems, security and human capability.

8.6 Performance Management and Benchmarking

Infrastructure performance shall be monitored through a structured cycle of definition, data collection, analysis, action planning and implementation. Performance management must assess reliability, punctuality, capacity, speed, safety and customer outcomes, and must support corridor-level action plans. Figure 8-3 sets out the performance improvement strategies adopted by Transnet and illustrates the practical measures used to strengthen infrastructure and operational performance across the network. The figure is included to show how performance monitoring should translate into targeted interventions that improve service delivery, asset condition and network efficiency.

The IM shall maintain robust data systems that enable real-time monitoring, reporting and analysis. Benchmarking shall be used to compare network operations and support functions with relevant peer organisations, with due regard for differences in scale, network complexity, electrification, staffing, centralisation and operating context. The purpose of benchmarking is not only to identify efficiency gaps, but also to define actionable improvements in operations, maintenance support and resource productivity.

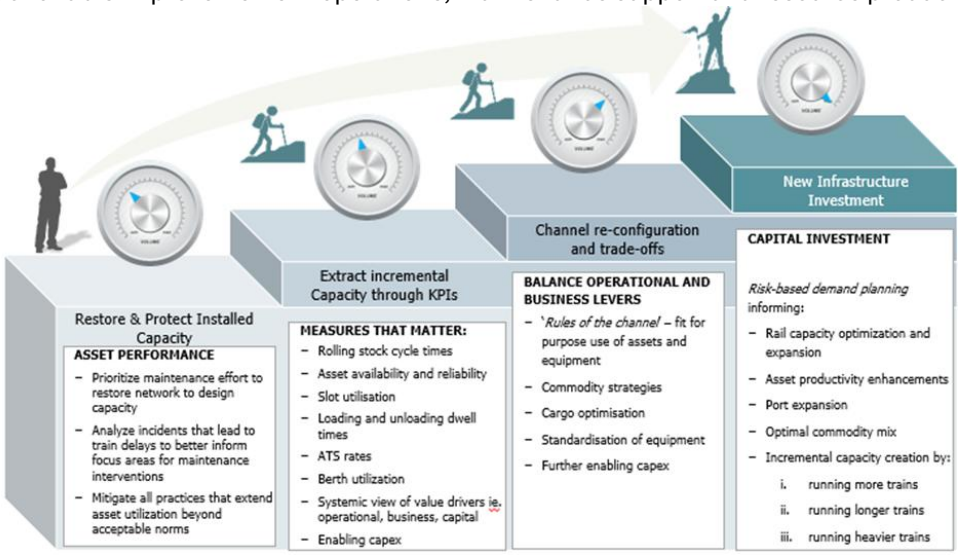


Figure 8-3: Performance improvement strategies (Source: Transnet)

8.7 Operational Requirements

The network shall support a disciplined framework for maintenance access, train planning and operational control. Occupation planning must distinguish between major and minor occupations and align annual timetabling, timetable revisions and operational control with maintenance needs.

Maintenance planning shall address strategic, tactical and operational challenges. Strategic issues include maintenance standards, contract design and the location of maintenance resources. Tactical issues include occupation scheduling, regular possession patterns, coordination of work packages, timetable compression, maintenance team routing and rescheduling. Operational issues include work timing, resource scheduling and the detailed planning of maintenance projects.

Track maintenance shall progressively transition from reactive to preventive, predictive and proactive approaches, supported by inspections, condition monitoring, measurement systems, rail grinding, ultrasonic testing, geometry monitoring, drones, ground-penetrating radar, thermal imaging, Ground Penetrating Radar (GPR), LiDAR and related technologies. It will be key for the infrastructure to be manage through and integrated system.

8.8 Capacity, Capability and Asset Condition

Capacity enhancement shall be driven by demand analysis, rail addressable market assessments, cost modelling, simulation and corridor capacity analysis. The policy approach is to create infrastructure capacity ahead of demand where justified, improve slot availability, and align investments to future market needs. This approach must be grounded in a clear understanding of the size, configuration and technical characteristics of the existing rail network, as these define the current operating envelope within which future interventions must be planned. Table 8-2 therefore provides a summary of the existing rail network, including track and route distance, traction systems, axle load capability, bridges and structures, train authorisation systems, and traction substations. The table is included to establish the baseline asset base and technical context against which capacity constraints, asset condition, corridor capability and future enhancement requirements should be assessed.

Table 8-2: Existing rail network

Km Distance	± 30 400 km track
Route Distance	±20 953 route km
Network Traction	-50kV AC (861 route km) -25kV AC (2 516 route km) -3kV AC (4 650 route km) -Diesel (12 955 route km)
Axle Load	-Main Lines at 20t/axle -Ore Line at 30t/axle -Coal at 26t/axle
Bridges/Structures	-Bridges 2 696 -Tunnels 198
Train Authorisation Systems	-Signalling Basic Stations 2 146
Traction substations	-3kV DC 346 -25kV AC 99 -50kV AC 7

A clear view of asset condition is required to support this process. Track, electrical systems and train authorisation systems shall be assessed using standardised inspection, measurement and audit methods. Track Quality Index, C-exceedances and other condition indicators shall be used to identify immediate interventions and to guide maintenance and renewal priorities. Asset condition assessments across both freight and commuter networks confirm that substantial rehabilitation, renewal and modernisation are required.

8.8.1 Asset Condition

The condition of rail assets plays an important role in ensuring the safe, efficient, and reliable operation of the rail network. It reflects the overall state of infrastructure, equipment, and systems, which can impact performance, maintenance needs, and safety standards. Regular assessments and monitoring are essential for identifying potential risks and prioritising repairs or upgrades. The following sections address the current physical condition for the freight and commuter infrastructure.

Table 8-3: Asset Condition Rating Scale

Ratings	Action
1	Preventative Maintenance
2	Preventative and Condition-based Maintenance
3	Preventative Maintenance and Repairs
4	Rehabilitation Required
5	Replacement Required
6	De-electrified

Table 8-4: Transnet Asset Condition Matrix

Corridor	Segment	Per way	Structures (Bridges)	Electrical	Train Authorisation	Condition Assessment & Protection Systems	Radio Networks	Transmission Networks	Off tracts (Service Roads)
North Corridor	Coal Line								
	Lephalale - Ogies								
Ore Corridor	Full Line								
Northeast Corridor	Pyramid - Beitbridge								
	Phalaborwa - Richards Bay								
	Greenview - Kaapmuiden								
Cape Corridor	Hotazel - PE								
	De Aar - Cape Town								
Central Corridor	Full Line								
Container Corridor	Full Line								

Table 8-5: PRASA Asset Condition Matrix

Corridor	Station	Perway	Electrical	Sub Stations	Signals	Telecoms
Gauteng	Mabopane – Pretoria					
	De Wildt – Pretoria					
	Pienaarspoort – Pretoria					
	Saulsville – Pretoria					
	Pretoria – Johannesburg (Centurion)					
	Naledi – Johannesburg					
	Leralla – Johannesburg					
	Centurion - Johannesburg					
	Daveyton - Dunswart – Germiston					
	Vereeniging - George Goch (via MDY) Incl. NSC, WST, FAR					

Corridor	Station	Perway	Electrical	Sub Stations	Signals	Telecoms
	Kwesine – Germiston					
	Springs – Germiston					
	Randfontein - Johannesburg					
	De Wildt - Hercules - Belle Ombre					
	Eerste Rivier - Muldersvlei					
	Mabopane - Pienaarspoort (via Capital Park)					
	New Canada- Houtheuwel					
Cape Town	Cape Town – Simonstown (Wynburg)					
	Cape Town - Retreat (Athlone)					
	Cape Town - Bellville (Sarepta)					
	Cape Town - Khayelitsha/Chris Hani					
	Cape Town - Kapteinsklip					
	Cape Town - Bellville (Goodwood)					
	Cape Town - Eerste rivier - Strand					
Durban	Durban – Umlazi					
	Durban - KwaMashu (Incl. Bridge City)					
	Kelso (Winkelspruit) - Durban					
	Crossmoor – Durban					
	Pinetown – Durban					

8.9 Network Development Direction

Network development shall be guided by a long-term national perspective. The infrastructure system must be rationalised, enhanced, expanded and reconfigured to meet future freight and passenger demand. This includes the selective strengthening of the core network, protection and appropriate treatment of feeder and short lines, and the development of infrastructure that enables road-to-rail migration, export competitiveness and improved passenger mobility.

The network classification approach shall distinguish between bulk mineral corridors, the core rail network, feeder lines and short lines. This allows investment to be directed towards corridors with clear strategic and economic value, while alternative operational, concessioning or safeguarding approaches are considered for lower-density lines.

8.10 Options to Enhance the Network

The suite of infrastructure interventions required over the planning horizon includes track maintenance and upgrades, signalling and control improvements, electrification, double tracking, expansion through new lines and loop extensions, station upgrades, terminal development, modern technology deployment and institutional arrangements that support open access and private participation where appropriate.

Figure 8-4 presents the rationalised national rail network to 2050. It illustrates how the network should be prioritised in line with existing classifications, corridor function, demand and strategic value, so that investment and operational effort are directed to the parts of the system that are most important to national freight, passenger and regional connectivity objectives. The figure is included to show that rationalisation is not merely a reduction of the network, but a structured approach to aligning each part of the railway to its appropriate long-term role, service level and investment response.

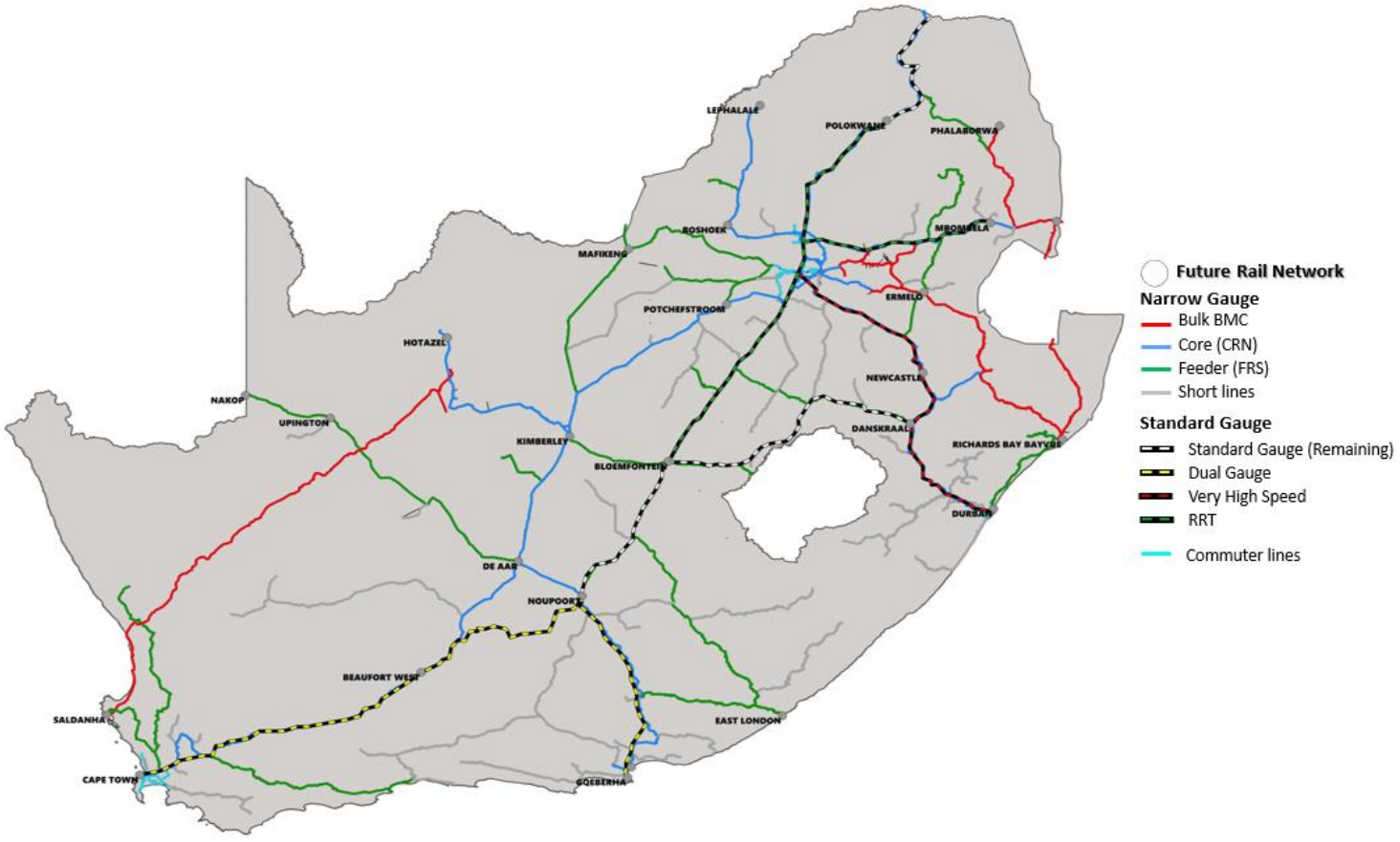


Figure 8-4: Proposed Rationalised National Rail Network - 2050

Table 8-6Table 8-6 provides a consolidated summary of the principal intervention areas required to restore, modernise and progressively expand the national rail system. It brings together the main categories of intervention, the nature of the proposed response, and the policy rationale for each, so that the relationship between network need, investment direction and intended system outcome is clear. The table is intended to show, at a strategic level, how the proposed programme responds to long-term network classification, freight and passenger priorities, regional integration, terminal efficiency, technology adoption and the future role of feeder and lower-density lines. Table 8-7 complements this summary by setting out the individual interventions in greater detail, including their corridor focus, purpose, core solution elements, and indicative cost and timing.

Table 8-6: Summary of proposed interventions

Section/Item	Proposed intervention	Policy rationale
Long-term network vision	Reclassify the network around bulk mineral corridors, the core rail network, feeder lines and short lines. Progressively align the network to demand, future option value and corridor function.	To direct investment to nationally significant corridors, improve sustainability, support road-to-rail migration and protect strategic rights of way where full operation is not immediately viable.
Long-term network vision	Advance corridor-specific upgrades on key freight routes, including loop extensions, double tracking, re-signalling, traction power upgrades, yard expansion and selective new links. Progressively introduce standard-gauge on priority intermodal and passenger-aligned corridors where justified.	To increase train slots, accommodate longer and heavier trains, improve travel times, strengthen export corridors and create a commercially credible long-term intermodal system.
Metro and passenger rail	Rehabilitate commuter infrastructure through track, signalling, telecommunications, station and rolling stock upgrades, supported by stronger security, better fare and modal integration, and improved operational planning.	To restore reliability, improve passenger safety and rebuild confidence in commuter rail as an affordable urban mobility mode.
Cross-border	Improve border rail corridors through infrastructure upgrades, interoperable processes, more efficient terminals and digital customs and passenger processing systems, while supporting priority SADC corridor projects.	To reduce border delays, improve regional trade efficiency, strengthen economic integration and support the movement of bulk and general freight across Southern Africa.
Hubs and terminals	Develop and modernise seaport interfaces, inland terminals, dry ports, compilation yards and logistics hubs in locations such as Durban, Richards Bay, Ngqura, Cape Town, Gauteng and central South Africa.	To improve road-rail-port integration, reduce congestion, support containerisation and automotive traffic, and increase supply chain efficiency.
Technology and systems	Adopt mechanised maintenance, condition monitoring, predictive maintenance, satellite monitoring, ground penetrating radar, formation and superstructure baselining, integrated train planning tools, and automated cargo and wagon identification.	To improve safety, maintenance precision, asset visibility, operating efficiency and whole-life cost performance.
B-Network, feeder lines and short lines	Retain and rehabilitate feeder lines that strengthen the core network, apply concessioning or partnership models where feasible, and safeguard rights of way on short lines even where services are limited or suspended.	To preserve strategic network reach, support future demand recovery, enable private participation on a level playing field and recognise the social as well as commercial value of lower-density lines. In this framework, the term short lines are used for those lines

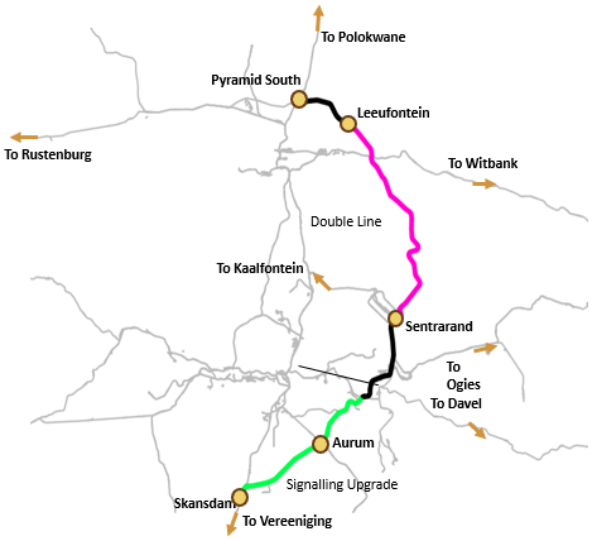
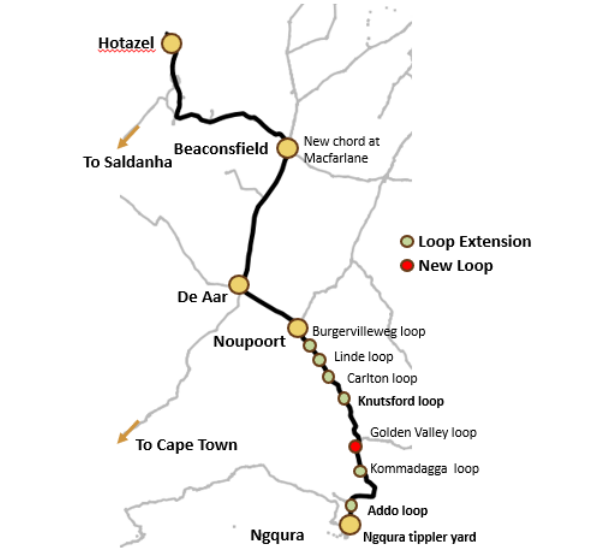
Section/Item	Proposed intervention	Policy rationale
		outside the Core Network that are referred to in earlier policy and implementation documents as branch lines or, in some cases, interchangeably as branch lines and short lines. This terminology is adopted to better distinguish between feeder lines, which support Core Network density and performance, and short lines, which generally play a smaller economic role but may still justify protection of the right of way and, where appropriate, subsidy or partnership-based operating models.

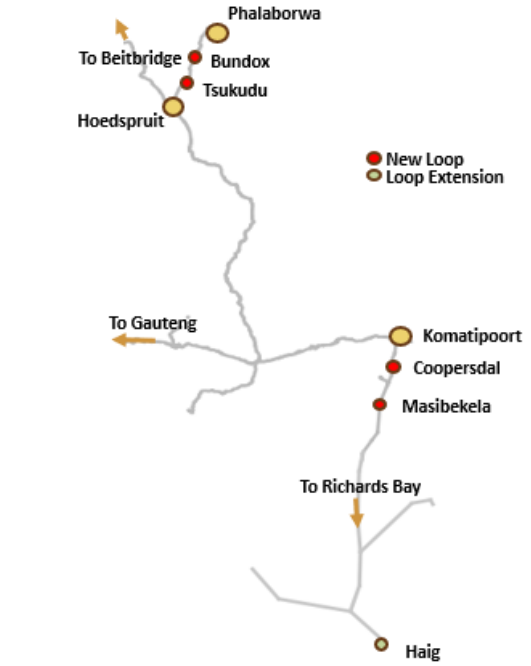
8.10.1 Interventions

The table below presents a summary of the principal rail interventions proposed to restore, modernise, and expand South Africa's rail network over the short, medium, and long term. It outlines the purpose, core solution elements, and indicative cost and timing of each intervention, covering backlog recovery, strategic freight corridors, standard-gauge development, metropolitan rail expansion, and associated hubs and terminals.

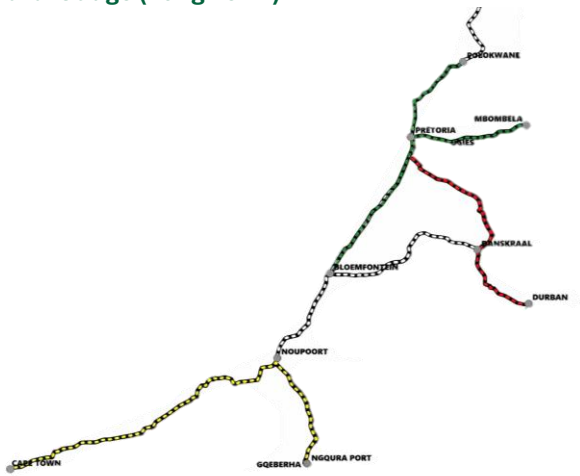
Table 8-7: Interventions

Interventions	Detail
Present Backlog	**Purpose:** To restore South Africa's passenger and freight rail network by addressing the severe maintenance, security, signalling, fleet, and infrastructure backlogs that have undermined reliability, capacity, affordability, and economic competitiveness. **Solution:** Implement a coordinated recovery programme focused on infrastructure rehabilitation, signalling and station restoration, stronger security and anti-vandalism measures, fleet renewal and locomotive recovery, targeted corridor upgrades, and greater private sector participation to rebuild safe, reliable, and efficient rail services. **Cost & Time:** Reinstate design Capacity-Reinstate to Pre-COVID levels 6. 6 billion. Reinstate design Capacity-Return to design level ~60.8 billion by 2030.
Sishen To Saldanha 	**Purpose:** Leverage existing 30-tonne axle load infrastructure and extend north to Hotazel to support additional manganese exports alongside iron ore. **Solution:** New compilation yard, upgrade Emil–Hotazel to 30tal, Salkor Yard upgrades, and additional loops: Infrastructure Upgrades. • New Manganese Compilation Yard. • Track strengthening: Emil–Hotazel to 30-ton axle load. • Sishen Yard Expansion to boost slot efficiency, Salkor Yard Enhancements. • Supports 60 mtpa iron ore + 12 mtpa manganese. • Quicker train Faster turnaround and higher operational capacity. • Port Capacity Expansion. • Upgrade/expand MPT berths at Saldanha. • Traffic Management. • General freight re-route via Kalbaskraal to ease pressure on Oreline. • Kalbaskraal upgrades required. **Cost & Time:** ~R5.3 billion between 2026–2034.

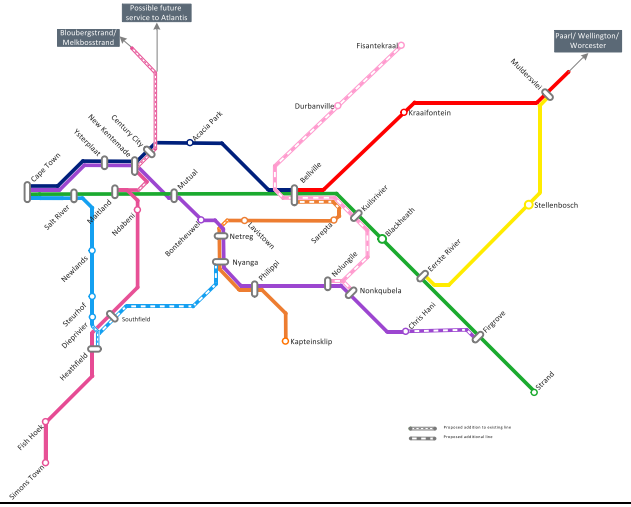
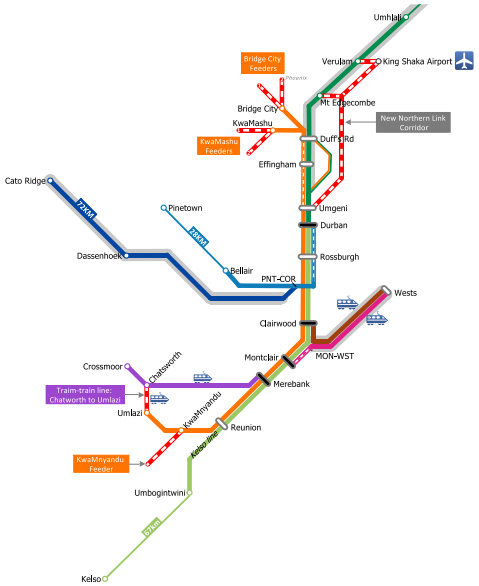
Interventions	Detail
Gauteng Freight Ring 	**Purpose:** Improve bi-directional flow of chrome, general freight, and intermodal cargo; support future PRASA expansions. **Solution:** Double lines between Leeufontein and Knoppiesfontein, signalling and power upgrades, future SG links to Zimbabwe: • Double line: Leeufontein–Knoppiesfontein. • Re-signalling: Sentrarand–Skansdam (5 stations). • Power upgrades: New 3kV DC substations for 150-wagon chrome trains. • Signalling system upgrade: Aurum–Skansdam. • Long-term vision: standard-gauge link to Polokwane/Beit Bridge. • Botswana–Rustenburg link not justified at current demand. **Cost & Time:** ~R4.4 billion between 2035–2039.
Hotazel To Ngqura 	**Purpose:** Expand capacity for growing manganese exports; optimise bulk flow to Ngqura port. **Solution:** Substation doubling, Electrical Power Supply System & Overhead Traction Equipment (OHTE) upgrades, 7 loop extensions, Beaconsfield change-over, and Paterson re-signalling: • Hotazel to Beaconsfield: Stabilisation yard and loop extension at Vlermuislaagte. • Beaconsfield to De Aar: Dual-voltage change-over facility at Beaconsfield, Substation upgrades and added OHTE feeders. • De Aar to Ngqura: New OHTE feeder (Doringkom–Verby), six loop extensions, one new loop, Paterson re-signalled, supports 3 daily automotive trains; SG line considered for rapid rail and containers due to passenger-related capacity pressure. **Cost & Time:** ~R2.15 billion from by 2030.

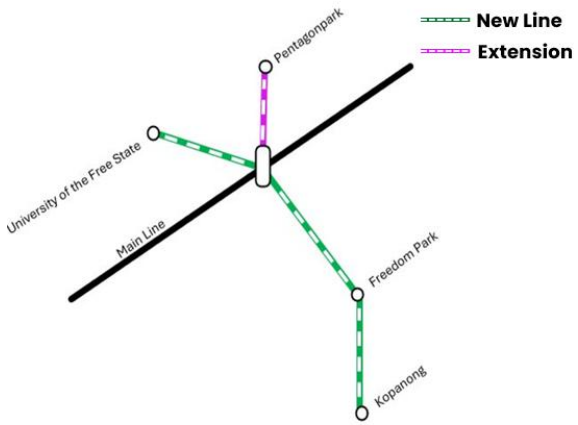
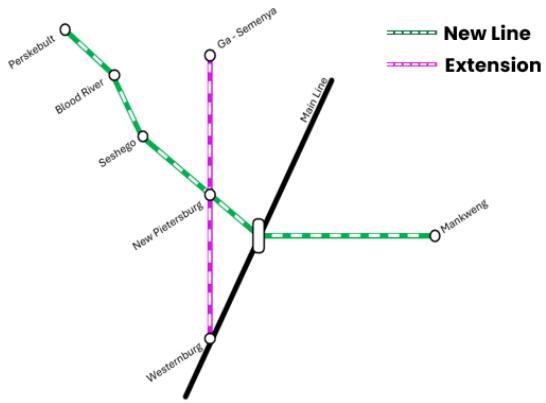
Interventions	Detail
Phalaborwa to Richards Bay 	**Purpose:** Support rising exports and enable long train operations to multiple ports. **Solution:** Loop extensions, traction upgrades, BRY yard interface, collaboration with Eswatini: • Add 2 New 80 Wagon Loops between Phalaborwa and Hoedspruit. • Add two new 80 wagon loops between Komatipoort and Mhlume/Northern Swaziland border. • Coopersdal new loop. • Masibekela new loop. • Extend Haig Loop. **Cost & Time:** ~R689 million by 2030.
Gauteng to Cape Town/Gqeberha 	**Purpose:** Enable mixed commodity and intermodal freight with long-term SG conversion potential. **Solution:** Loop additions and extensions, double lines, yard upgrades at Waltloo and Kaalfontein. Vereeniging to Bellville: • New double-track and loop upgrades (e.g. Ganna, Matjiesfontein) enable 50-wagon trains. • Target: 20 trains/day; future demand may outpace capacity. Waltloo to Gqeberha: • Growth in containers, diesel, and autos (Ukuvuselela: 361,621 FBUs/year). • Upgrades: loop extensions, Gqeberha Port line, Waltloo yard, Kaalfontein siding. • Efficiency tied to manganese project; SG may shift containers off NS line. **Cost & Time:** ~R9.3 billion by 2049.

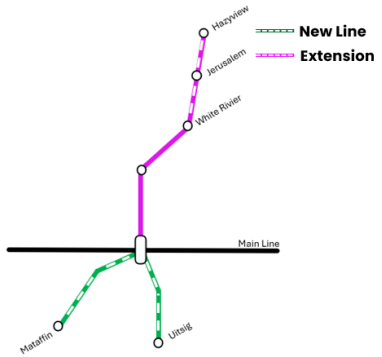
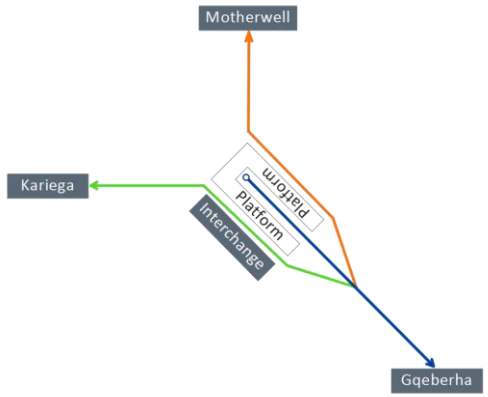
Interventions	Detail
Lephalale to Richards Bay 	**Purpose:** Boost heavy haul export capacity and ease congestion from the Waterberg and Ermelo areas. **Solution:** Double lines, tunnel at Overvaal, new loops, Ermelo yard and substation upgrades: Lephalale–Pyramid: • Double-tracking from De Wildt to Dam; new Pendoring Yard for 150-wagon trains; loop upgrades at Turfground and Boshoek. Pyramid South Yard upgrades. Ogies–Richards Bay: • New Overvaal tunnel to unlock 17 slots; Ermelo Yard upgrades; OHTE and signalling enhancements; axle load increase to 26t/axle proposed. **Cost & Time:** ~R21.9 billion from 2030–2044.
Gauteng to Zimbabwe 	**Purpose:** Strengthen regional connectivity and position SA as a gateway to the SADC region. **Solution:** Loop additions to support increasing volumes of copper, fuel, and containerised goods: • Loop extensions and new crossing loops proposed to address capacity constraints. • Enhances connectivity between Gauteng, Polokwane, and Zimbabwe. • Rising copper exports expected to drive further corridor development. **Cost & Time:** ~R299 million from 2045–2049.

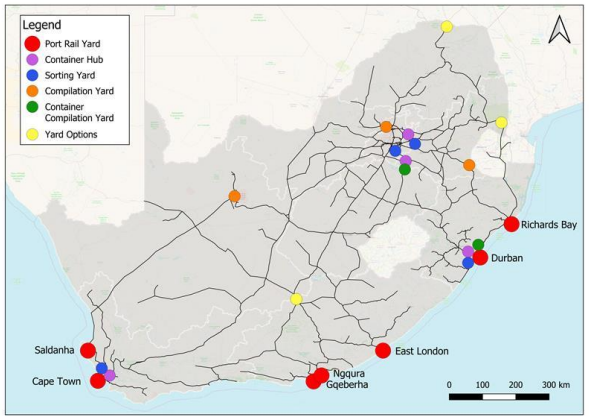
Interventions	Detail
Gauteng to Durban 	**Purpose:** Shift high-value general freight from road to rail and unlock port efficiency at Durban. **Solution:** Restore to design levels, introduce longer trains, consider SG conversion, yard and formation upgrades: • Long-term option: operate 100-wagon trains (multiples of current 50-wagon design) to streamline yard handling and reduce shunting. • Loop extensions needed to support longer trains, especially if one line is converted to standard-gauge. • Construction would require single-line operation; vacuum-braked trains must be replaced with air-braked stock. • Signalling upgrades are only needed if the corridor remains narrow-gauge long-term. **Cost & Time:** ~R67.4 billion by 2030.
Standard-Gauge (Long Term) 	**Purpose:** To introduce standard-gauge rail on priority corridors to support higher-speed, higher-capacity, and more stable passenger and freight services that improve mobility and shift high-value freight from road to rail. **Solution:** Develop strategic greenfield standard-gauge corridors, Gauteng to Durban as the most viable long-term high-speed route, and Gauteng to Mbombela, Polokwane, and Bloemfontein as strong rapid rail transit options, while avoiding disruption to the existing network. Future standard-gauge railway lines along several parts of the corridor have been mooted such as: • Coastal corridor from eThekwini to Cape Town via Eastern Cape cities • Cape-Natal railway from Pietermaritzburg only reaching Kokstad. • Linking Mthatha and Port Shepstone. • RRT between Mthatha and Gqeberha. • Connecting East London to Gqeberha via Cookhouse to close the East London to Springfontein line for lack of traffic. • RRT between Richards Bay and a smart city on the KZN south coast • Extend RRT and intermodal rail from Mbombela to potentially link with Maputo. **Cost & Time:** ~R1.3trillion phased from 2025–2050.

Interventions	Detail
Gauteng 	**Purpose:** To integrate the Metro and Gautrain networks into a complementary provincial rail system that improves connectivity across residential, commercial, and industrial areas while increasing the overall value and reach of public transport. **Solution:** Combine the broad coverage of the outer Metro network with the rapid transfer function of the inner Gautrain network to create a more connected system, strengthen network value through greater node integration, and significantly increase Gautrain ridership. • New Line ○ Krugersdorp – Naledi – Lenasia. ○ Nancefield – Nasrec, Westgate – Boousens – Faraday. ○ Winternest – Hammanskraal. ○ Winterveld – Mabopane. ○ Koedoespoort – Mamelodi/Eerste Fabriek – Mamelodi East. ○ Daveyton – Daveyton Feeder, Daveyton – Etwatwa. ○ Roadbend – Kwatsaduza. ○ Kwesine – Zonkeziswe – Angus. ○ Saulsville West – Saulsville. • Extension to Existing Line ○ GMR W – GMR S, Germiston. ○ Germiston – East Rand. ○ Hartebeesporrt – Hercules. ○ Winternest – Pretoria West. • Gautrain ○ Marlboro to Soweto Link. ○ Jabulani to Mamelodi via Cosmo City. ○ Rhodesfield to Boksburg Link. ○ Cosmo City to Lanseria Airport Link. **Cost & Time:** ~R28.057 billion phased from 2030–2044.

Interventions	Detail
Cape Town 	**Purpose:** To expand and strengthen the Cape Town metropolitan rail network by improving connectivity between residential areas, employment centres, and growing development corridors, while increasing access, network coverage, and public transport efficiency. **Solution:** Develop new rail links and strategic extensions to existing lines to create a more integrated and accessible metropolitan rail system. • New Line ○ Nyabga – Southfield – Heathfield. ○ Kraaifontein – Fisantekraal – Durbanville – Bellville – Kuilsrivier – Nolungile – Nonkqubela. ○ Chris Hani – Firgrove. ○ Sarepta – Bellville. • Extension to Existing Line ○ Dieprivier – Heathfield. ○ Maitland – New Kentemade – Century City – Blouberg. ○ Netreg – Laviston. **Cost & Time:** ~R31.680 billion phased from 2030–2044.
eThekweni 	**Purpose:** To expand and integrate the eThekwini rail network so that it provides broader access across key residential, commercial, industrial, and strategic growth areas, while improving overall public transport connectivity and supporting higher ridership. **Solution:** Develop targeted new lines, feeders, extensions to existing lines, and a new tram connection, including to create a more connected and accessible metropolitan rail system. • New Line ○ KwaMnyandu - KwaMnyandu Feeder. ○ Verulam – King Shaka Airport – Mt Edgecombe – Umgeni. ○ KwaMushu – KwaMushu Feeder. ○ Bridge City – Bridge City Feeder. ○ Bridge City – Phoenix. • Extension to Existing Line ○ Mon West - Montclair. ○ Durban – Rossburgh. ○ Duff's Road – Effingham – Umgeni. • New Tram ○ Chatworth – Umlazi. **Cost & Time:** ~R10.626 billion phased from 2030–2044.

Interventions	Detail
Bloemfontein Metro 	**Purpose:** To address increasing transport demand and improve urban mobility in Bloemfontein by providing a reliable and efficient alternative to road-based transport, particularly between residential areas and major employment hubs. **Solution:** Development of a new commuter rail network to reduce road congestion and enhance accessibility: • New Line: University of the Free State – Freedom Park – Kopanong. • Extension of Existing Line: Mainline to Pentagonpark. **Cost & Time:** ~R9.438 billion between 2035-2044.
Polokwane Metro 	**Purpose:** To address increasing transport demand and improve urban mobility in Polokwane by providing a reliable and efficient alternative to road-based transport, particularly between residential areas and major employment hubs. **Solution:** Development of a new commuter rail network to reduce road congestion and enhance accessibility: • New Lines: Perskebult - Blood River - Seshengo, New Pietersburg – Mankweng. • Extension to Existing Line: Westernburg – New Pietersburg - Ga – Semenya. **Cost & Time:** ~R9.438 billion between 2035-2044.

Interventions	Detail
Mbombela Metro 	**Purpose:** To address increasing transport demand and improve urban mobility in Mbombela by providing a reliable and efficient alternative to road-based transport, particularly between residential areas and major employment hubs. **Solution:** Development of a new commuter rail network to reduce road congestion and enhance accessibility: • New Lines: Mataffin – mainline – Uitsig. • Extension to Existing Line: White Rivier – Jerusalem – Hazyview. **Cost & Time:** ~R9.438 billion between 2035-2044.
Eastern Cape Metro and Passenger 	**Purpose:** Passenger rail services in Nelson Mandela Bay and Buffalo City have declined significantly due to ageing infrastructure, vandalism, poor maintenance and unreliable diesel operations. The proposed intervention seeks to revitalise rail services and restore rail as a reliable, efficient and sustainable public transport option aligned with current urban growth areas. **Solution:** • Convert the existing heavy rail network into a modern tram-train or light rail system aligned with current demand. • Develop a “three-point star” network linking Gqeberha, Motherwell and Kariega via a Swartkops interchange hub. • Separate commuter and freight operations to improve service reliability and frequency. • Upgrade and electrify key sections of the network, with battery or hydrogen-powered trams considered as alternatives to diesel. • Rehabilitate stations and depots to improve safety, accessibility and passenger facilities. • Integrate rail with road-based public transport to support multimodal connectivity and metro development objectives. **Cost & Time:** ~R9.438 billion between 2035-2044 .

Interventions	Detail
Hubs and Terminals 	**Purpose:** To improve modal interoperability and reduce the time trains spend in terminals leading to improved rolling stock utilisation and lower operation costs per trip. **Solution:** Develop new inland terminals to support movements of goods to and from ports and economic hubs. Terminals will act as consolidation and distribution zones with direct rail links. Port rail yards will also require expansion and upgrades to support future volumes. **Cost & Time:** ~R17.102 billion phased between 2035-2054.

8.11 Conclusion

The Infrastructure Statement establishes that rail recovery depends on disciplined asset stewardship, the restoration of basic condition, the modernisation of obsolete systems, and the timely expansion of capacity where demand justifies investment. Infrastructure policy must therefore be implemented through coordinated planning, clear standards, secure funding pathways, stronger institutional capability and sustained execution.

Taken together, the proposed interventions provide a practical pathway towards a smart, resilient and modern rail network that is capable of supporting national development, improving logistics competitiveness, strengthening regional integration and restoring confidence in both freight and passenger rail services.

9 Rolling Stock Statement

9.1 Introduction and Purpose

The NRMP, through the Rolling Stock Statement, provides a national framework for the governance of rolling stock on the South African Railway System. The Rolling Stock Statement sets out mandatory requirements, recommendations and guidelines for how rolling stock should enter the Network, remain in service, be redeployed or removed from service, and be renewed over time in support of a safe, reliable, efficient and more equitable rail sector.

In an open access environment, where multiple stakeholders have an interest in rolling stock, including TOCs, rolling stock owners, leasing companies, manufacturers and other interested parties, the RS Statement also provides guidance to enable equitable access, improve interoperability, strengthen lifecycle performance, provide clearer expectations for industry participants, and support long-term fleet renewal, investment and sector development.

Historically, these matters were managed by the incumbent operators, namely Transnet, PRASA and Gautrain, through their internal processes. In a multi-operator environment, however, a wider range of train operating companies, rolling stock owners and other parties will introduce new, modified, rebuilt, leased or redeployed rolling stock onto the network. This creates new requirements for fairness, consistency, technical compatibility, safety oversight and lifecycle control that go beyond the direct mandate and operational control of Transnet Rail Infrastructure Manager (TRIM) and the RSR. Through the Rolling Stock Statement, the NRMP provides a policy instrument to level the playing field.

The NRMP is a forward-looking framework intended to facilitate the transition of the railway system towards the future envisaged in the NRP White Paper. Accordingly, this draft Rolling Stock Statement is also intended to serve as a stakeholder engagement tool, enabling affected parties to engage with the proposed national governance framework for rolling stock in South Africa.

9.2 Objectives

The Rolling Stock Statement is structured around four key objectives aligned with the rolling stock lifecycle phases within the railway system, namely entry and acceptance, operational continuity, removal and redeployment, and long-term investment and energy efficiency. The NRMP objectives in relation to rolling stock are as follows:

- Rolling Stock Entry and Acceptance into the System: To set out the minimum mandatory requirements and guidelines for rolling stock to enter the national railway network. These requirements and guidelines are intended to ensure that all rolling stock, whether new, refurbished, modified or leased, complies with minimum national technical and operational requirements, together with the applicable statutory safety requirements administered by the RSR.
- Sustained Performance (Operational Continuity): To set out the minimum mandatory requirements and guidelines relating to the conditions and management principles for maintaining the performance of rolling stock in service. This includes the relevant regulatory frameworks, maintenance standards, and lifecycle considerations needed to support consistent performance and optimal network utilisation by multiple train service operators.
- Removal and Redeployment Conditions: To set out the minimum mandatory requirements and guidelines for the removal, detaching or redeployment of rolling stock in a manner that supports operational sustainability in a multi-operator environment.
- Investment and Energy Guidance: To provide a guiding framework for localised investment in rolling stock, with emphasis on efficiency improvements, energy efficiency and long-term sustainability.

9.3 Scope and Methodology

Annexure RS_A sets out the 18 scope elements considered in the development of the Rolling Stock Statement, aligned to the four objectives discussed above. Figure 9-1 illustrates the relationship between these objectives and the scope elements, considered in the context of rolling stock governance within a multi-operator railway environment.

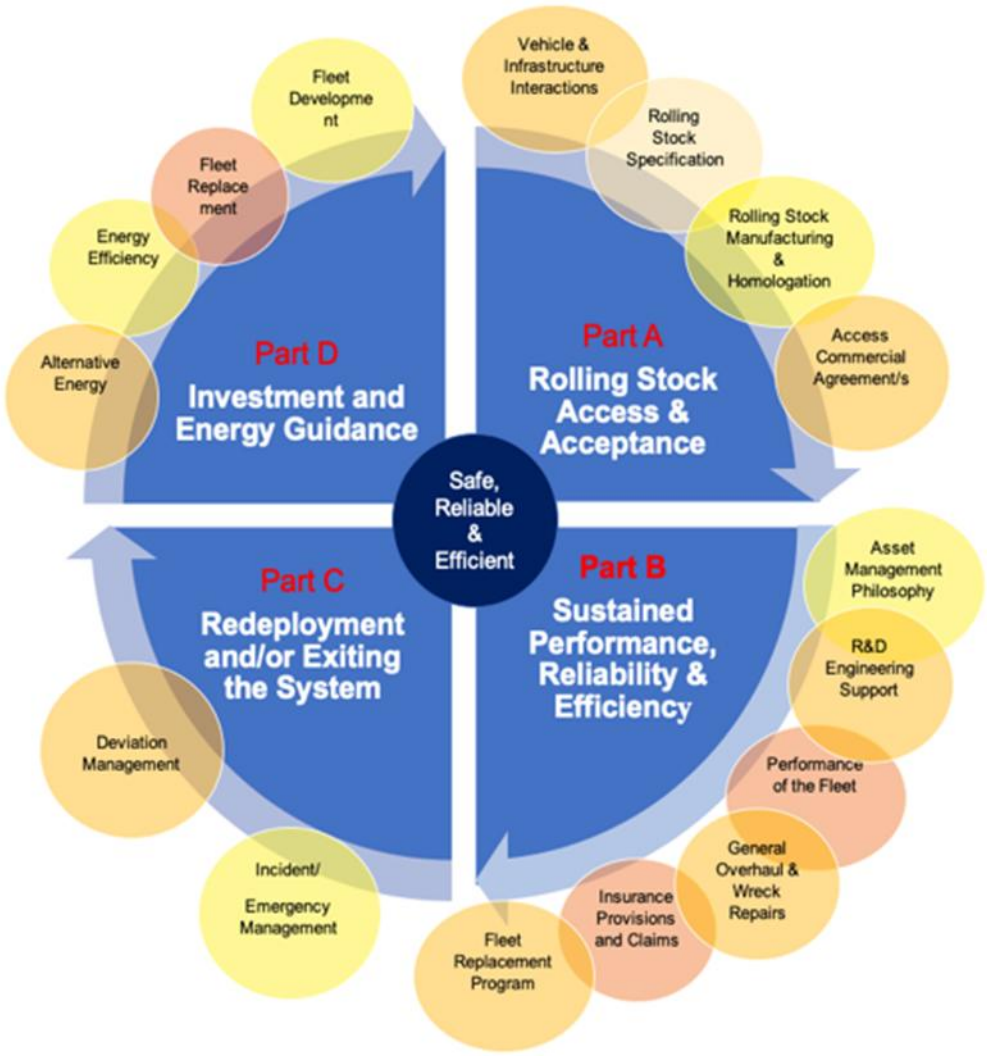


Figure 9-1: Illustration of rolling stock lifecycle and scope elements

These scope elements reflect the breadth of matters considered in developing the Rolling Stock Statement. They provide the basis for a rolling stock governance framework that addresses immediate safety and compliance needs, as well as the wider technical, operational, commercial, institutional and investment considerations influencing rolling stock performance across its lifecycle. The framework is intended to support safe, reliable and efficient railway operations, while facilitating equitable access and long-term system stability in a multi-operator environment.

The methodology followed a structured and forward-looking approach, with consideration given to the following:

- Desired future state: Defined the long-term direction for rolling stock access, governance and performance, aligned with the NRP White Paper.
- Avoiding legacy bias: Applied a "begin with the end in mind" perspective to avoid carrying existing inefficiencies and constraints into the future framework.
- Benchmarking: Considered relevant international practice from multi-operator rail systems to inform the proposed requirements, guidelines and recommendations.

- Current South African context: Considered the current rail context in South Africa to identify key gaps, constraints and transition requirements.
- Stakeholder engagement: Provides a basis for consultation with affected stakeholders across the rolling stock value chain and regulatory environment.
- Final proposals and implementation planning: Supports the finalisation and structured implementation of rolling stock reform following consultation.

Accordingly, the proposed requirements, guidelines and recommendations in this Rolling Stock Statement are grounded in a structured consideration of the matters most relevant to rolling stock governance and are intended to support practical implementation in a future multi-operator railway environment.

In this draft NRMP, the proposed requirements, guidelines and recommendations relating to rolling stock are classified into three categories:

- Mandatory: Minimum requirements based on legislation and applicable technical, operational and/or safety standards, whether existing or to be established.
- Essential: Requirements critical for sound governance and for efficient and reliable operations, even where they do not directly affect safety.
- Desirable: Requirements intended to strengthen operational efficiency, support continuous improvement and promote a culture of excellence.

This distinction recognises that not every proposal carries the same weight or urgency. Some are minimum conditions for safe and controlled participation in the railway system. Others are necessary for the system to function effectively in practice. Others are intended to strengthen the system progressively over time.

9.4 Stakeholder Implications of the Rolling Stock Statement

The NRMP, through the Rolling Stock Statement directs and signals what different stakeholders in the railway system will be expected to do, to prepare for, or to engage with as the sector transitions toward an open and multi-operator environment. The table below summarises the principal implications for the main stakeholder groups.

Table 9-1: Rollingstock Stakeholder Statement principal implications

Stakeholder	What the Statement means for them
TOCs and operators	Access to the network will increasingly depend on compliance with common entry requirements, route and interface compatibility, rolling stock certification, and continuing compliance while in service. Operators will also be expected to participate in structured maintenance and performance arrangements, and to manage redeployment and removal of rolling stock in accordance with common network and national rules.
Rolling stock owners and lessors	The Statement signals a need for stronger lifecycle traceability, compliance documentation, ongoing certification, maintenance accountability, and clearer arrangements when rolling stock is modified, redeployed, transferred or withdrawn.
Manufacturers, rebuilders / Heavy repairers	Design, manufacture, modification, rebuilding and homologation will increasingly need to align with a *standardised national framework*, rather than rely only on project-specific or operator-specific approaches.
Maintainers and workshops	The Statement requires clearer maintenance accountability, more auditable standards, stronger asset-management discipline, and closer alignment between maintenance performance and continued operation on the network. Entities in Charge of Maintenance (ECMs) shall be required to demonstrate that their maintenance activities comply with the national standards framework and provide assurance that

Stakeholder	What the Statement means for them
	the rolling stock under their care remains safe, reliable and fit for service, thereby protecting the capacity and integrity of the national rail network.
Government, Regulators and the IM	The Statement points toward a clearer separation between government policy responsibilities, regulatory enforcement, infrastructure access control, and technical standards development. • Government is responsible for setting policy direction and the enabling framework. • Regulators are responsible for enforcing compliance with legislation, safety requirements and regulatory obligations within the mandate of their establishing Acts. • The IM is responsible for managing and controlling access and movements requirements consistently across the network; and • Detailed national technical and operational standards shall be developed and maintained through an appropriate national standards framework, proposed herein as the SARISB to become a recognised standards-setting structures. This distinction is important to avoid conflating policy-setting, standards development and independent regulatory enforcement.
Investors, insurers and funders	The Statement signals a move toward a more structured and predictable rolling stock regime. Over time, this should improve risk visibility, create clearer standards for fleet replacement and lifecycle management, and support better financial and insurance decisions, especially where smaller operators and new market entrants are involved.
Other interested parties	Industry bodies, labour, certifiers and standards-setting institutions are expected to play a more collaborative role in building national frameworks, standards, training capability, certification systems and oversight arrangements that support the integrity of the national railway system.

9.5 Summary of Key Observations and Gaps

Applying the scope and methodology described above, key observations relevant to the governance of rolling stock in a future multi-operator railway environment were identified. These observations reflect the principal gaps between the current state and the desired future state envisaged by the NRP White Paper. They provide strategic direction for the NRMP in facilitating the transition of rolling stock governance and form the basis for the proposed requirements, guidelines and recommendations set out in this Statement.

Table 9-2: Table of Key Observations

Category	Observation	Why this matters in a multi-operator environment
Standards, certification and acceptance governance	South Africa does not yet have a fully standardised, nationally recognised and independently enforceable framework for rolling stock certification and acceptance in a multi-operator railway system. At present, the principal standards in use are largely those developed by and for Transnet, PRASA and Gautrain operations. While some of	This creates uncertainty regarding the standards to be applied, the process to be followed, the evidence required for acceptance, the role of certifying bodies, and the equitable treatment of different operators, manufacturers and rolling stock owners. It also risks blurring the respective roles of the IM, manufacturers and TOCs in the certification and acceptance process for

Category	Observation	Why this matters in a multi-operator environment
	these standards are suitable for adoption or adaptation as national standards, they have not yet been formally established as such.	new rolling stock introduced into the network. The current regime for accepting private rolling stock onto Transnet lines is not sufficient for the requirements of a future multi-operator railway system.
Vehicle–infrastructure interaction and technical compatibility	Vehicle–infrastructure interaction is currently managed largely through operator-specific engineering practices, route knowledge and internal acceptance processes. While this may have been workable in a more closed operating environment, it does not yet provide a sufficiently standardised and transparent basis for assessing compatibility across multiple operators, routes and rolling stock types. The Transnet Network Statement is a significant step toward addressing this gap. However, continued improvement will be required, considering the broader proposals set out in this Rolling Stock Statement. Refer to Annexure RS_B.	In a multi-operator environment, inadequate clarity on route compatibility, loading limits, electrical and mechanical interfaces, signalling interfaces, electromagnetic effects, and other system interactions may create safety, performance and access risks. Without a clearer and more consistent national approach, different operators may face inconsistent treatment, and the network may be exposed to avoidable operational instability.
Maintenance, asset management and lifecycle accountability	Maintenance practices, asset-management maturity, lifecycle accountability and performance visibility remain uneven across the sector. Established operators have internal maintenance systems, standards and decision-making processes, but these have not yet been consistently translated into a common national framework applicable across the industry. There is not yet a recognised accreditation or assurance framework that provides confidence that rolling stock entering and operating on the network is being maintained to an acceptable standard and is sufficiently reliable for its intended mission.	This creates a risk that rolling stock performance and operational continuity will depend disproportionately on the capabilities, resources or legacy systems of individual institutions, rather than on a common national framework. In a multi-operator environment, this may undermine reliability, transparency, consistency and equitable participation, particularly for new entrants and smaller operators. Most importantly, undermaintained rolling stock may compromise the integrity and capacity of the national network by causing avoidable failures, disruptions and knock-on operational impacts across the shared system.
Fleet performance visibility and reliability assurance	Although aspects of rolling stock performance are monitored within individual institutions, South Africa does not yet have sufficiently standardised fleet performance measures and reporting arrangements across the sector.	In a multi-operator environment, limited performance visibility reduces transparency and makes it more difficult to compare outcomes, identify systemic weaknesses, protect network capacity and support evidence-based regulatory, investment and maintenance decisions.

Category	Observation	Why this matters in a multi-operator environment
	Existing practices do not yet provide a common basis for assessing availability, reliability, maintainability, utilisation and lifecycle condition across different operators and fleets.	A shared railway system requires a clearer and more consistent view of rolling stock performance across the national fleet.
Insurance, claims and risk allocation	Insurance and claims arrangements exist within the current rail environment, but they are not yet aligned to a more open and standardised multi-operator framework for rolling stock. Existing arrangements are often institution-specific and may not yet provide clear, efficient and consistent approaches to claims, liability, recovery and risk allocation across multiple parties.	If insurance and claims arrangements remain fragmented, this may increase cost, delay incident recovery, weaken incentives for sound lifecycle management, and reduce confidence for operators, owners, lenders and insurers. In a multi-operator environment, unclear risk allocation may also become a barrier to market participation and investment.
Redeployment, deviation, incident response and exit management	The current environment does not yet operate with a fully standardised framework for how rolling stock that becomes non-compliant, damaged, withdrawn, detached, redeployed or decommissioned should be managed across the national rail system. While incumbent operators may have internal procedures for some of these matters, they are not yet structured as a common national regime for a shared network.	In a multi-operator environment, inconsistent arrangements for deviation management, incident response, removal, redeployment and final exit may create technical, safety, operational and commercial uncertainty for all parties using the network. A shared railway system requires greater clarity on responsibilities, decision rights, controls and recovery arrangements at each stage of the rolling stock lifecycle.
Fleet development, replacement and industrial capability	Long-term rail reform requires more than control over current rolling stock operations. While fleet renewal, procurement and industrial participation have been addressed within specific programmes and institutions, South Africa does not yet have a sufficiently integrated national framework linking fleet development, replacement planning, local manufacturing capability and long-term sector needs in a multi-operator context.	Without such a framework, short-term fleet decisions may not align with longer-term system requirements, industrial development objectives or future market needs. This may weaken localisation outcomes, constrain supply-chain development, and limit the sector's ability to renew fleets in a coordinated and sustainable manner.
Energy efficiency and technology transition	Current rolling stock operations include some consideration of energy performance, but there is not yet a sufficiently clear and coordinated framework for rolling stock energy efficiency, metering, technology transition and the	In a multi-operator and future-focused rail environment, the absence of a clearer framework for energy efficiency and technology transition may result in missed opportunities to reduce lifecycle costs, improve environmental performance and align future fleet

Category	Observation	Why this matters in a multi-operator environment
	adoption of alternative energy solutions across the sector. Existing practices remain fragmented and are not yet fully positioned to support long-term transition at a system level.	development with broader national sustainability objectives.

Taken together, these observations indicate that the transition to a multi-operator railway environment requires a more coherent national framework for how rolling stock is accepted, managed in service, monitored, recovered, redeployed or removed, renewed and governed across its full lifecycle. The proposed requirements, guidelines and recommendations set out in this Rolling Stock Statement are intended to respond to these observations and to support a safer, more reliable, more equitable and more future-ready railway system.

9.6 Summary of Proposed Requirements, Guidelines and Recommendations

The observations and gaps set out above indicate that the transition to a multi-operator railway environment shall require an integrated and coherent national framework that addresses governance of rolling stock across its full lifecycle, from entry into the network, through operation and maintenance, to redeployment, removal, renewal and long-term investment.

Accordingly, the Rolling Stock Statement sets out proposed requirements, guidelines and recommendations intended to support a safe, reliable, efficient and equitable railway system. These proposals include both cross-cutting measures that apply across the rolling stock lifecycle and specific measures aligned to each of the four objectives of the Rolling Stock Statement, which are hereafter presented as Parts A to D.

9.6.1 Cross-cutting Requirements, Guidelines and Recommendations

Certain proposals apply across the full rolling stock lifecycle and should be regarded as foundational to the future governance framework.

Table 9-3: Cross-cutting proposed requirements, guidelines and recommendations

Category	Cross-cutting proposed requirements, guidelines and recommendations
Mandatory	1. Establish a South African Rail Industry Standards Board (SARISB) to define, coordinate and manage a nationally recognised and enforceable framework for railway standards in South Africa. The DoT shall establish an interim transitional board while the necessary legislative processes are underway. The SARISB shall include Government, regulators and affected industry stakeholders, and shall lead the development of railway standards, including rolling stock standards. Refer to Annexure RS_C for clarification of institutional roles. 2. Establish a national rolling stock register to facilitate full traceability of rolling stock throughout its lifecycle and place of use, aligned where appropriate with the Luxembourg Rail Protocol.
Essential	The SARISB, working with the DoT, shall set out the guidelines and implementation process for these requirements. In relation to rolling stock, it shall: • Adopt, define and maintain minimum national requirements for entry, continued operation, recovery, redeployment and decommissioning.

Category	Cross-cutting proposed requirements, guidelines and recommendations
	• Review, adapt and adopt current Transnet, Gautrain and PRASA standards of national interest, and • Establish a national rolling stock certification framework aligned, where appropriate, with relevant international standards. • Provide that, over time, rolling stock certification through an accredited process becomes a precondition for entry to the network and recognised evidence for acceptance by the IM. • Adopt and build capacity for a standardised and structured lifecycle governance framework for rolling stock, including consistent asset-management processes incorporating ISO 55001 principles. • Adopt and implement rolling stock maintenance accountability and performance-monitoring arrangements equivalent in intent to the European Union model, under which Entities in Charge of Maintenance (ECMs) are subject to an ECM certification framework that sets consistent, auditable maintenance responsibilities, practices and oversight standards across the industry; and • Build industry skills capacity, support innovative financing, technology adoption to improve long-term sector performance and competitiveness.
Desirable	Promote mutual recognition of suitable prior rolling stock certifications, subject to compliance with all other national entry requirements. Strengthen digital compliance, certification and performance-monitoring systems across the rolling stock lifecycle.

9.6.2 Proposed Requirements, Guidelines and Recommendations for Part A to D

The Rolling Stock Statement also sets out proposals specific to each lifecycle phase addressed in Parts A to D.

Table 9-4: Lifecycle-Based Rolling Stock Proposals and Recommendations

Part / Section	Focus	Recommendations
Part A — Rolling Stock Entry & Acceptance	Safety, technical and operational requirements for admitting rolling stock into the national network (certification, route/interface compatibility, operational readiness)	**Mandatory:** Establish a national rolling-stock certification framework (IEC 61133 / EU TSI / AS7501 aligned) and require certification pre-entry; require route-specific vehicle–infrastructure compliance checks (axle/load, gauge, OHTE/pantograph, signalling/EMI) prior to acceptance; require annual rail-worthiness certification by accredited bodies, valid RSR Permit/Licence to Operate and proof of liability insurance for all operators/ Rolling Stock Operating Companies (ROSCOs). **Essential:** Constitute SARISB to adopt/adapt standards, define entry/acceptance and transitional rules; implement independent third-party testing/validation and mutual recognition for comparable prior certifications; create and populate a national rolling-stock register for traceability and acceptance decisions. **Desirable:** Deploy a digital certification/tracking system and pilot certification programmes for small/new entrants; publish

Part / Section	Focus	Recommendations
		harmonised national rolling-stock specifications and phased derogation/transition guidance.
Part B — Sustained Performance, Reliability & Efficiency	Maintenance governance, rail-worthiness, lifecycle accountability, performance monitoring and asset-management discipline	**Mandatory:** Require operators to implement ISO 55001 aligned asset management systems and mandated internal audits; establish registration/certification for ECMs and independent oversight of maintenance compliance; define/enforce minimum maintenance governance, rail worthiness and overhaul/wreck repair requirements. **Essential:** Create a centralised maintenance/asset data registry; require standardised maintenance SOPs, lifecycle records and KPIs reporting (MDBF, availability, maintenance compliance); mandate accredited maintenance assurance processes and periodic reporting to IM/RSR; develop national overhaul and wreck repair standards and workshop certification. **Desirable:** Promote IoT/condition-monitoring and predictive-maintenance analytics, national training programmes, benchmarking and public performance dashboards.
Part C — Removal, Redeployment & Exit	Management of non-compliant, damaged, withdrawn, detached, redeployed or decommissioned rolling stock; deviation & incident response	**Mandatory**: Establish national removal/redeployment/decommissioning rules with clear detachment criteria and safe removal/transport procedures; implement a central deviation management system and deviation database to log/track/escalate non-compliance and incidents; require minimum insurance cover and standard claims procedures as a condition of network access. **Essential:** Set up independent compliance oversight (industry body or expanded RSR mandate) to review/arbitrate deviation/detachment decisions; define/adopt national technical standards for emergency recovery attachments/interfaces (jacking/lifting points, recovery couplings); establish incident & emergency management procedures, a Deviation Review Board and clear responsibilities/decision rights for redeployment and staging. **Desirable:** Standardise exit/transfer documentation; strengthen lifecycle traceability for redeployment/residual-value management; conduct joint incident-recovery exercises and create shared recovery asset pools.
Part D — Investment, Fleet Development & Energy Guidance	Long-term fleet renewal, procurement strategy, localisation, financing and energy/technology transition	**Mandatory:** Develop a national fleet renewal policy and implementation plan with minimum technical specifications and procurement principles aligned to IM and RSR; require new-build rolling stock to meet adopted national specifications for network acceptance. **Essential:** Develop an integrated fleet replacement roadmap (lifecycle cost analysis, priorities, timelines); set localisation targets and a local manufacturing capacity development programme; create financing frameworks and guidance (PPPs, leasing, DFIs, green finance) and incentives to de-risk private investment; adopt energy metering and reporting standards (EN 50463 reference) and publish energy efficiency/staged

Part / Section	Focus	Recommendations
		technology transition guidance (electrification/hybrid/alternative traction). **Desirable:** Introduce green incentive schemes (tax/credit/subsidy) for energy-efficient rolling stock; evaluate Luxembourg Rail Protocol alignment to improve finance ability; fund R&D/AI pilots for operational energy optimisation and export/regional manufacturing strategy.

9.6.3 Summary of the Policy Direction

These proposed requirements, guidelines and recommendations are intended to do four things. First, to create a clearer and more equitable basis for rolling stock entry into the national network. Second, to strengthen the reliability, safety and accountability of rolling stock in service. Third, to provide greater control and clarity when rolling stock is removed, redeployed or exits the system. Fourth, to support a more strategic and sustainable approach to fleet renewal, industrial capability, financing and energy transition.

9.7 Conclusion

The Rolling Stock Statement sets out the NRMP's proposed national framework for the governance of rolling stock across its full lifecycle within the South African railway system. It brings together the main policy issues and sector considerations that require a coordinated national response, including standards governance, certification and acceptance, technical compatibility, maintenance assurance, lifecycle accountability, redeployment control, fleet development and energy transition.

In doing so, the Rolling Stock Statement provides a practical basis to affect the future envisaged in the National Rail Policy White Paper: a railway system that is more open, more standardised, more equitable, and better able to support multiple operators over time. Its purpose is not only to define minimum requirements, but also to create the governance conditions necessary for safe access, reliable operation, orderly lifecycle management and long-term sector sustainability.

The Statement therefore proposes a framework in which:

- Mandatory requirements establish the minimum conditions for safe and controlled participation in the railway system.
- Essential requirements strengthen the governance, reliability and effective functioning of the system.
- Desirable requirements support longer-term improvement, innovation and industry maturity.

Taken together, these measures are intended to level the playing field for rolling stock participants, protect the integrity and capacity of the South African national railway network, and guide the transition towards a future-ready, multi-operator railway environment. The Rolling Stock Statement therefore serves not only as a policy instrument, but also as a structured basis for stakeholder engagement, further refinement and phased implementation in support of a safer, more coherent and more sustainable railway system.

10 Train Service Statement

10.1 Purpose of the Chapter

This chapter establishes a train services framework to support the transition of South Africa's rail system toward a modern, demand-responsive, and integrated railway. The framework is aligned with identified market requirements and applicable international standards.

10.2 Introduction

This chapter provides for the establishment of an enabling environment within which South Africa's train services are structured around the rail network as the central and unifying system component. The framework recognises the requirement for a coordinated and demand-driven railway network that supports defined market segments and mobility needs.

Provision is made for the assessment of operational and structural characteristics of the current system to inform the development of a National Railway that is reliable, efficient, and economically sustainable. This includes the identification of system conditions and the establishment of defined development pathways.

The framework is based on the principles of Rationalisation and Optimisation as overarching considerations for freight and commuter rail operations. These principles include:

- Alignment of infrastructure with operational requirements.
- Provision of capacity in accordance with projected demand.
- Enhancement of network connectivity.
- Standardisation of technologies.
- Coordination of planning across infrastructure management entities, including TRIM, PRASA, and other infrastructure managers.

Rationalisation is defined to include system reconfiguration and modernisation in accordance with current and future operational requirements, including application within metropolitan commuter corridors. The Train Operations Philosophy provides for the transition to a scheduled and capacity-managed operating model. This includes the establishment of defined service categories and operational parameters across freight, commuter, and long-distance passenger services. The framework provides for the allocation of services across corridors that are designated and configured in accordance with operational requirements, where feasible.

10.3 System Evolution

South Africa's railway network has developed in accordance with historical economic and logistical requirements, resulting in corridor configurations designed to support specific industrial and trade functions. The current network reflects these configurations and associated system characteristics, including operational structure, infrastructure design, and service patterns. The future network is defined as an integrated and functional system aligned with contemporary logistics and mobility requirements. This includes the application of appropriate signalling systems, automated train control technologies, infrastructure design standards, and rail technologies to support operational efficiency and network integration.

10.4 Scheduling Philosophy

The IM shall ensure the provision of punctual, reliable, and efficient rail services to TOCs, passengers, and other stakeholders. Train scheduling shall constitute the process of developing, in advance, an operational plan that defines the timing and sequencing of train movements across the network, as well as the continuous updating of such plans during operations.

No train shall be permitted to enter the network unless it is scheduled. All train movements shall form part of the Integrated Train Plan.

Computerised scheduling and dispatching systems shall be utilised to support the development and management of train schedules, including during normal operations and in response to disruptions. These systems shall incorporate a high level of operational detail and realism while maintaining acceptable computational performance. The scheduling system shall generate a conflict-free disposition schedule, assigning travel paths and departure times to each train movement within a defined time horizon, and shall minimise delays within the network. The system shall operate in accordance with prevailing traffic conditions and applicable safety requirements.

The IM shall implement a weekly capacity review process to account for changes in network configuration and topology, including temporary speed restrictions, infrastructure failures, and alternative operational arrangements. These changes shall be incorporated into capacity assessments and reflected in updated operational plans.

The IM shall communicate significant capacity changes to TOCs throughout the timetable period, including any reductions in available capacity.

10.5 Train Performance and Monitoring

Train performance shall be measured using a structured framework of KPIs applicable to both freight and passenger services. These KPIs shall address operational efficiency, capacity utilisation, financial performance, safety, customer satisfaction, asset management, environmental impact, and rolling stock reliability.

For freight operations, KPIs shall include, but not be limited to, On-Time Performance (OTP), border crossing efficiency, utilisation of train slots, average speed, turnaround and cycle times, dwell times, and payload utilisation. Safety performance shall be measured through accident and injury rates, while customer-related indicators shall include satisfaction and complaint levels.

For passenger operations, KPIs shall include OTP with defined thresholds, occupancy and utilisation rates, dwell and turnaround times, connection reliability, and service condition indicators. Passenger satisfaction shall be measured through surveys, Net Promoter Scores, and complaint records. Asset and rolling stock performance shall be assessed using indicators such as Mean Distance Between Failures (MDBF), Mean Time to Repair (MTTR), maintenance compliance, and utilisation rates.

Performance monitoring shall be conducted using data obtained from both TOCs and the IM. Data exchange agreements shall be established to ensure data confidentiality, integrity, and accessibility.

Condition Monitoring systems shall be implemented for rolling stock and infrastructure to support early detection of potential failures and to enable condition-based maintenance practices. These systems shall support improved operational reliability and asset availability.

10.6 Train Control Systems

Rail traffic control systems shall be implemented to optimise the safe utilisation of network capacity. Track Warrant Control shall continue to be applied on lower-capacity lines. Integration of Track Warrant systems with onboard computer (OBC) systems shall be implemented to enable electronic authorisation, including functions such as movement authority enforcement, speed control, and automated braking.

Colour light signalling systems shall continue to operate where installed. Future development shall prioritise the implementation of European Train Control System (ETCS) technologies.

ETCS Level 2 systems shall consist of lineside signalling integrated with in-cab communication for equipped locomotives, supported by electronic interlocking and conventional signalling components.

ETCS Level 3 systems shall utilise in-cab signalling with minimal lineside equipment, enabling moving block operation. This approach shall support reduced headways and increased capacity on applicable sections of the network.

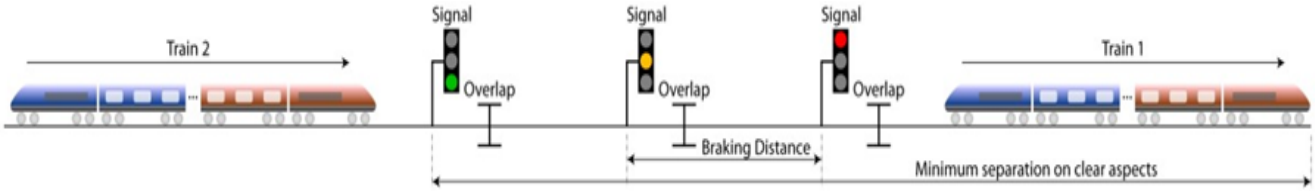


Figure 10-1: Example of 3-aspect signalling, showing minimum separation between two consecutive trains (Marinov,2009)

10.7 Passenger Information Systems

Passenger Information Systems (PIS) shall provide accurate, timely, and accessible information to passengers throughout the travel journey. This shall include pre-boarding, boarding, and onboard information services.

PIS shall be accessible to all passengers, including those with visual and hearing impairments, and shall be delivered through multiple communication channels.

The IM shall utilise PIS to disseminate safety-related information and emergency communications. Real-time visual and audio information systems shall support passenger awareness and response during operational incidents or evacuations.

10.8 Freight Information Systems

A Freight Information System (FIS) shall be implemented to support the efficient management of freight operations. The system shall enable real-time access to operational data and support coordination across the rail network.

The FIS shall provide the following functionalities:

1. Access to real-time train movement information, including timetables, forecasts, operational updates, and delay notifications via internet-based platforms.
2. Integration with IM systems for direct data acquisition.
3. Interoperability in cross-border operations involving multiple Infrastructure Managers.
4. Data visualisation and integration tools to support train management and operational decision-making.
5. Integrated consignment and works-order management system.

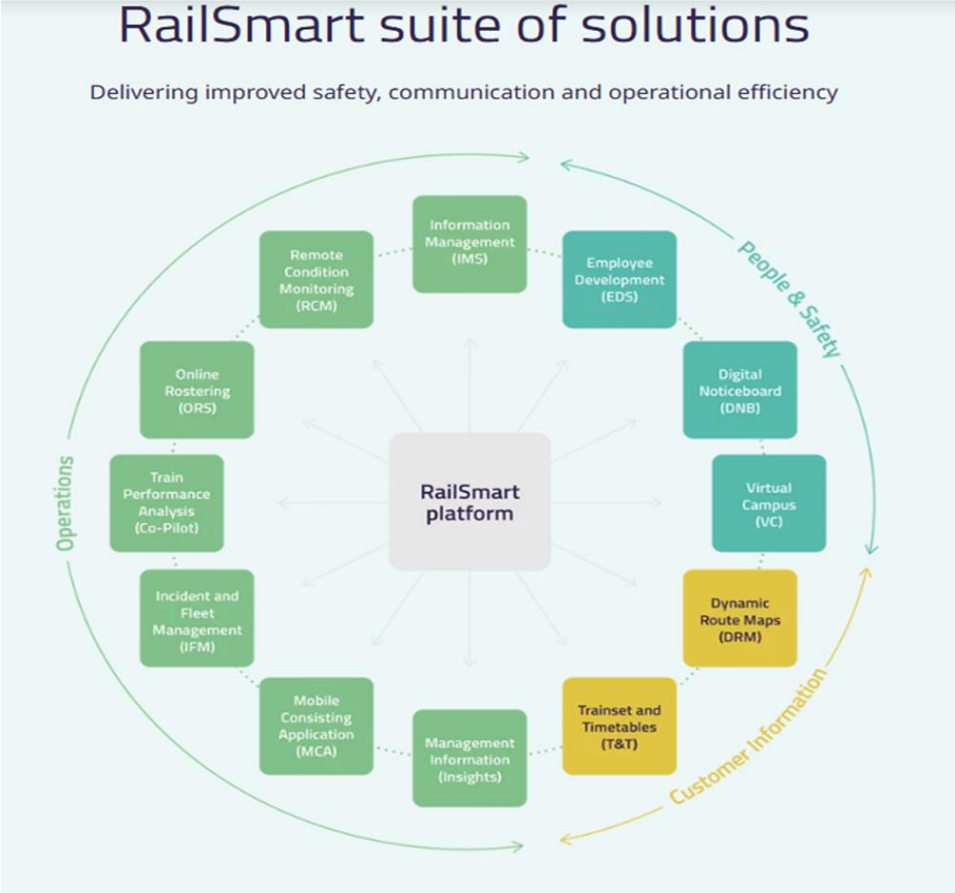


Figure 10-2: Rail Freight Information System

10.9 Security

Railway operations shall be conducted within a regulated framework prioritising safety and security. Network operators, TOCs, and station operators shall establish and maintain Safety Management Systems in accordance with applicable standards, including SANS 3000-1.

Safety Management Systems shall include defined procedures, processes, and controls. Risk assessments shall be conducted on a continuous basis, and measurable safety objectives shall be established and maintained.

10.10 Modal Integration

Modal integration shall be implemented to support the development of an integrated public transport system. Rail shall function as the primary high-capacity, high-frequency mode within the transport network.

Integration shall include coordination with bus services, minibus taxis, and non-motorised transport systems to ensure network accessibility.

Physical integration shall be achieved through the development of intermodal transport interchanges enabling seamless transfers between modes.

Operational integration shall consider total journey time and cost across modes. Fare integration mechanisms shall be implemented where applicable within metropolitan transport systems.

10.11 Intermodal Freight

Intermodal freight transport shall involve the movement of goods using standardised containers or vehicles across multiple transport modes, including rail, road, and maritime transport, without handling the cargo during modal transfers.

Rail shall support intermodal freight operations through the provision of high-capacity, long-distance transport services. Operational requirements shall include sufficient traffic density, block train operations, reduced shunting, scheduled services, balanced directional flows, and standardised freight configurations.

10.12 Conclusion

This chapter establishes a framework for the transformation of South Africa's rail system into a modern, integrated, and demand-responsive network. It provides for the transition towards a coordinated railway system aligned with national mobility requirements and international best practice.

The framework is underpinned by the rationalisation and optimisation of the network, supported by a structured train operations philosophy that incorporates scheduled services, capacity management, and reliability. Provision is made for investment in appropriate infrastructure, advanced train control systems, and information systems, together with integrated planning across infrastructure managers to support improved performance.

The chapter further provides for the implementation of structured scheduling, performance monitoring, safety management, and data-driven operational processes to ensure efficiency and consistency across the network. It also recognises modal and intermodal integration as essential components of an effective transport system, supporting both passenger mobility and freight logistics.

Implementation of this framework is premised on institutional alignment, sustained investment, and ongoing modernisation, to position the rail system as a reliable and strategic component of South Africa's transport network.

11 Information Management Statement

11.1 Introduction

This chapter establishes the IM framework and digital platform strategy for the NRMP. Effective information management is the connective tissue that binds strategic planning, operational execution, asset stewardship, and (PSP into a coherent and transparent system.

South Africa's rail sector currently suffers from profound information fragmentation. Critical data, track condition measurements, tonnage flows, rolling stock health, concession milestones, resides in disconnected Excel spreadsheets, proprietary operational systems, and deep institutional silos. This fragmentation is a structural barrier to private investment, efficient operations, and accountable governance.

The experience from previous rail concession arrangements has shown that information asymmetry between the public sector and concessionaires can create governance and oversight challenges if not proactively addressed. Where concessionaires control the majority of operational, financial and performance data, the state may face difficulties in independently monitoring delivery, enforcing contractual obligations and making informed decisions. As South Africa moves towards a model with multiple rail concessions across different corridors and commodity types, the scale and complexity of managing information flows will increase significantly. It is therefore essential that data-sharing requirements, reporting standards, independent monitoring mechanisms and public-sector analytical capability are built into concession structures from the outset.

The NRMP Digital Platform, under development, is the institutional response to this challenge. It is not simply a database or a dashboard, it is a governed, intelligent, multi-layered information ecosystem designed to give DoT visibility across South Africa's 30 000+ track km rail network.

This chapter describes the legislative and policy context governing information management, the roles and responsibilities of custodian entities, the core IM processes, and, in substantive technical detail, the architecture of the Digital Platform. This includes the Centralised Knowledge Base with its triple-leg ontology model, the Geospatial AI (GeoAI) and Business Risk Exposure (BRE) module for intelligent risk-based asset management, the AI-driven scenario planning engine, and the governance structures that ensure the platform remains authoritative and trustworthy over the 20–30-year lifecycle of rail concessions.

The information management architecture described in this chapter should be understood as a target-state framework to be implemented in phases. Its successful implementation depends on minimum data standards, defined governance arrangements, institutional capability, and progressive improvement in source-system quality across the rail sector. In the near term, transitional manual and hybrid arrangements may still be required while the underlying data environment, operational disciplines and technical capabilities are being stabilised. Advanced analytics and AI-enabled functions should therefore be introduced progressively, in line with the maturity of the underlying information base and governance controls.

11.2 Policies, Procedures, Standards, and Guidelines

A comprehensive suite of existing policies guides the NRMP's IM framework, including the Guideline on the Collection and Management of Service Point Data (2022), the National Archives Act (Act No. 43 of 1996), and standards under the Spatial Data Infrastructure Act (2003). These provide the legal and procedural backbone for the effective handling of spatial and non-spatial data.

Key principles emphasise the need for consistent data management practices, integration with national standards, and adherence to data governance frameworks that ensure security, reliability, and accessibility.

11.3 Roles and Responsibilities

The governance of the NRMP Digital Platform requires clearly delineated custodianship across the key institutional actors:

Entity	Role	Data Custodianship
DOT / Rail Planning Office	Platform owner; IM policy authority; Base Data Coordinator (CSI designation)	Owns the Linear Reference System, NRMP master forecasts, PSP contract registry, concession KPI baselines
TFR	Freight operational data; infrastructure condition reporting	Freight corridor tonnage actuals, track condition scores, maintenance records
Transnet Port Terminals (TPT)	Port throughput and capacity data	Terminal throughput volumes, capacity utilisation, commodity throughput by corridor
PRASA	Passenger rail operational data	Passenger volumes, metro network condition, rolling stock fleet health and age
Private Concessionaires (PSPs)	Report to DoT via standardised APIs; consumers of the LRS	Corridor-specific operational metrics, CAPEX project milestones, asset condition updates
Chief Information Officer (CIO)	Information governance; POPIA compliance; security policy	Tiered access control; ISO 27001 certification; audit trails

The operationalisation of the roles and custodianship arrangements described above is contingent on the execution of formal Data Sharing Agreements (DSAs) between DoT and each contributing entity, principally Transnet (TFR, TPT, and TNPA) and PRASA. These agreements define the data types to be provided, submission frequencies, quality standards, permissible use conditions, and liability arrangements governing data exchanged through the platform. DSAs are a structural precondition of the Digital Platform's data exchange architecture; without them, the knowledge base cannot be populated with the authoritative operational data on which the BRE module, scenario planning engine, and PSP governance functions depend. Where entities do not voluntarily enter into DSAs within the timeframes established by the Rail Planning Office, the Minister of Transport holds statutory authority to compel data provision under the National Land Transport Act and applicable sector legislation. The negotiation and execution of DSAs is therefore designated a critical path activity in the platform implementation programme, as detailed in the recommendations set out in Section 11.6.

The DoT, through the Rail Planning Office and the national rail information framework, serves as custodian of policy-supporting data, strategic knowledge and national planning intelligence.

This role is intended to support planning, coordination, transparency and evidence-based decision-making. It does not replace or dilute the statutory, regulatory, operational or technical responsibilities of other institutions.

It is recommended, however, that regulators retain their enforcement and oversight responsibilities, infrastructure managers retain their infrastructure acceptance and network access responsibilities, operators retain their operational responsibilities, and standards-setting and certification functions remain with the legally competent institutions designated for those purposes.

11.4 Core Information Management Processes

11.4.1 Collection of Data

Data collection is a continuous, process governed by standardised templates and submission protocols. PRASA, Transnet (TFR, TPT), and private concessionaires are required to collect, validate, and maintain rail sector data aligned with user-defined specifications and applicable national standards.
Standardised data submission templates must be developed and enforced for all contributing entities. These templates define:

- Structured data formats: Geospatial coordinates using the national coordinate reference system, tonnage per corridor in standardised commodity categories, track condition scores on a 0–100 scale, and modal split percentages.
- Temporal granularity: Annual for demand forecasts and major KPIs; quarterly for infrastructure condition assessments; monthly for PSP project milestones.

- Unstructured data: Technical reports, feasibility studies, concession agreements, inspection certificates, and environmental assessments, submitted with structured metadata and indexed in the document store.

Custodians may engage third-party vendors for data collection, LiDAR survey firms, geotechnical assessment contractors, rolling stock condition specialists, subject to strict compliance with DoT quality assurance requirements and data security protocols.

11.4.2 Storage of Data

The NRMP Digital Platform employs a multi-modal storage architecture detailed in Section 11.6. Storage formats are selected based on data type: PostgreSQL with PostGIS for structured and spatial data; PgVector and Memgraph vector and graph database for complex relational queries across the network ontology; and an object/document store for unstructured reports and LiDAR point cloud archives. The system progressively migrates away from Excel as the primary working format for authoritative data.

All spatial datasets must be accompanied by metadata conforming to ISO 19115 and SANS 1878. Storage schemas are version-controlled, with a changelog maintained in the database tracking all schema modifications, data updates, and source metadata, automated through the workflow engine.

11.4.3 Distribution of Information

Datasets must be distributed in machine-readable formats, GeoJSON, CSV, ArcGIS Feature Services, and RESTful API endpoints, with an emphasis on interoperability. Static PDF formats are to be avoided as primary data distribution vehicles given their limited analytical utility.

Each distributed dataset must be accompanied by a metadata record (ISO 19115 compliant), a data dictionary defining fields, units, and coding conventions, an update frequency and last-updated timestamp, and access conditions referencing the applicable data sharing agreement.

The Digital Platform implements role-based access control (RBAC) with four access tiers: internal DoT users with full read/write access; external custodians (Transnet, PRASA) with write access limited to their own datasets; concessionaires with read access to their corridor data and write access for milestone reporting; and public-facing read-only dashboards for non-sensitive indicators.

11.4.4 Archiving and Retention

Data archiving practices comply with the National Archives and Records Service Act. Operational data is retained for a minimum of seven years; concession contract records and associated performance data are retained for the full term of the concession plus fifteen years. LiDAR survey datasets, as primary inspection records, are retained indefinitely.

11.4.5 Destruction of Data

Before data destruction, approval must be obtained from the National Archivist in line with Section 13 of the National Archives Act. The DoT's Records Management Policy outlines procedures for the authorised disposal of records, ensuring all actions are legally compliant and properly documented.

11.5 DoT Knowledge Repository Management

11.5.1 Freight Databank

The National Freight Logistics Strategy (2005) identified critical gaps in freight data across all transport modes. To address these gaps, the DoT established a National Freight Databank, guided by principles of cost-effectiveness, measurability, and user accessibility. Tools such as GIS and Excel are leveraged to support freight data analysis, with an emphasis on simplicity and utility across the logistics value chain.

The databank is vital for tracking freight trends, identifying bottlenecks, and informing strategic transport planning.

11.5.2 Rolling Stock Information Domain

The national rail information framework shall include a rolling stock information domain to support lifecycle governance, safety assurance, interoperability, planning and economic regulation. At a minimum, this domain should include vehicle identity, technical classification, custodianship, route compatibility, certification and approval status, maintenance and inspection history, configuration and modification history, redeployment and transfer records, and withdrawal or decommissioning status.

The national rolling stock register shall form part of this information domain and shall be maintained in a manner that supports traceability, controlled access and the integrity of lifecycle records, and that is aligned, where appropriate, with the Luxembourg Rail Protocol.

11.5.3 Overview of System Architecture

The NRMP Digital Platform is a five-layer architecture integrating geospatial intelligence, structured data management, operational data feeds, intelligent analytics, and multi-stakeholder visualisation. It is designed from the outset to be multi-concessionaire ready, capable of managing five to seven concurrent concessionaires without architectural retrofit.

The DoT operates an Enterprise GIS using Esri's ArcGIS platform, supported by robust database environments (MS SQL Server, PostgreSQL) hosted in Azure South Africa North. A three-tier database architecture (presentation, application, and data tiers) ensures secure, scalable, and efficient data management.

A spatial dashboard currently hosted externally visualises asset locations, but migration to internal DoT infrastructure is planned. Non-spatial data is managed using Mendeley Reference Manager, facilitating document organisation, searchability, and reference management.

11.5.4 The Centralised Knowledge Base

11.5.4.1 Purpose and Scope

The primary objective of the NRMP Digital Platform is to create a comprehensive, centralised knowledge base for the NRMP, consolidating all spatial and non-spatial data currently managed in Excel spreadsheets, proprietary modelling packages, and specialist sub-consultant systems. This knowledge base will:

- Serve as the single source of truth for all 16 chapters of NRMP rail forecasts, including tonnage per corridor, modal splits, infrastructure condition, and demand projections.
- Enable dynamic, continuous updates that transform the NRMP from a static five-yearly document into a living strategic system.
- Support advanced scenario planning through an ontology-based system integrated with large language model (LLM) capabilities.
- Underpin PSP by providing investors and concessionaires with transparent, independently verifiable infrastructure and demand data.

11.5.4.2 Database Architecture

The knowledge base is built on PostgreSQL PostGIS extension, selected for its maturity, open-source licensing, extensive GIS capabilities, and avoidance of vendor lock-in. The core schema is organised into the following functional domains:

- Corridor and Network Domain.
- Tonnage and Demand Domain.
- Asset and Condition Domain.
- PSP and Concession Domain.

A supplementary Memgraph graph database is maintained alongside PostgreSQL for complex relational queries, particularly network topology analysis (which corridors are affected if a bridge fails?), multi-hop dependency chains, and concessionaire relationship graphs.

To further enhance the platform's analytical capabilities, a pgvector vector database is integrated within the PostgreSQL ecosystem. This module enables efficient storage and retrieval of high-dimensional vector

embeddings, supporting advanced applications such as semantic search, similarity matching, and natural language querying powered by large language models. By leveraging pgvector, the system can rapidly identify related infrastructure assets, forecast demand patterns, and facilitate intelligent scenario planning based on nuanced data relationships, making the database architecture robust and future-proof for AI-driven operations across the rail network.

11.5.5 The Triple-Leg Ontology Model

The knowledge base is structured around a triple-leg ontology model, adapted from the Palantir approach to enterprise knowledge graph construction. This ontology provides the semantic scaffolding that allows the Digital Platform to support intelligent scenario planning, natural language querying, and LLM-driven analysis, not just static data retrieval.

11.5.5.1 Leg 1: Data Structure and Relationships

The first leg defines the core entities of the rail knowledge domain and the typed relationships between them, encoded in both the PostgreSQL relational model and the Memgraph graph layer.

Typed relationships in the graph model include:

- Corridor CARRIES Commodity (with tonnage and year attributes).
- Corridor FEEDS_INTO Port Terminal.
- Asset IS_LOCATED_ON Corridor (at a specific LRS measure).
- Concessionaire OPERATES Corridor (under a Concession Contract).

11.5.5.2 Leg 2: Constraints and Business Rules

The second leg encodes the **domain-specific constraints and business rules** that govern valid states of the knowledge base, preventing logically impossible data states, enforcing regulatory limits, and ensuring that LLM-generated scenario outputs remain physically and commercially plausible.

LLM prompt-level constraints injected into every scenario planning request:

- Corridor capacities as hard physical ceilings on tonnage scenarios.
- Minimum maintenance intervals per asset class.
- Concession starts dates as temporal anchors (no PSP revenue before commercial operations date).
- Geophysical boundaries preventing logically inconsistent scenario combinations.

11.5.5.3 Leg 3: LLM Actions

The third leg enables the large language model to take structured actions against the knowledge base, not merely retrieving static data, but actively generating scenarios, computing impacts, and writing results back to the database. This transforms the platform from a passive data store into an active intelligence system.

11.5.6 The Linear Reference System

The Linear Reference System (LRS) is the geospatial foundation upon which every other data layer in the Digital Platform is anchored. It is the authoritative coordinate framework for the entire rail network, the system by which every asset, measurement, condition score, tonnage figure, and concession boundary is assigned a precise, reproducible location along the track.

The LRS will be implemented using Esri ArcGIS's linear referencing capabilities, which provide mature tooling for dynamic segmentation (the ability to associate attributes to any sub-segment of a route without duplicating geometry), event tables (linking external data to the LRS via from-measure and to-measure references), and network analysis across routed geometries.

The fundamental unit of the LRS is the chainage measure, the cumulative distance in kilometres from a defined network datum point along each named route. Every NRMP corridor is defined as a named LRS route, and every data element, asset locations, condition scores, speed restrictions, tonnage figures, concession boundaries are uniquely referenced by route name and chainage measure.

11.5.7 Network Statement Alignment

The LRS section definitions are deliberately aligned with the Network Statement, the published document that defines the tradeable segments of the rail network available for access charging, concession packaging, and track access agreements. This alignment means that:

- Concession boundaries in legal contracts map directly to LRS route-measures.
- Infrastructure condition data aggregated to the Network Statement section level can be referenced directly in due diligence materials for PSP transactions.
- Track access charges and performance penalties can be computed automatically against LRS-referenced condition and performance data.

11.5.8 Security Architecture and Compliance

11.5.8.1 Data Classification

All data within the platform is classified into four sensitivity tiers:

- Tier 1 — Public: Non-sensitive aggregated indicators (national tonnage trends, high-level condition indices). Published on the public-facing dashboard.
- Tier 2 — Official: Corridor-level KPIs, infrastructure condition data, maintenance records. Accessible to DoT staff, Transnet, and PRASA under data sharing agreements.
- Tier 3 — Restricted: Concession contract terms, financial performance data, detailed asset condition profiles, BRE scores. Accessible to RPO, specific DoT business units, and the relevant concessionaire for their own corridor.
- Tier 4 — Confidential: Data and outputs generated by enterprise-level Large Language Models (LLMs), including proprietary AI algorithms, model training datasets, and sensitive outputs. Access is strictly limited to authorised enterprise users and governance teams to ensure confidentiality and compliance with organisational and regulatory standards.

11.5.8.2 Security Controls

OAuth 2.0 with multi-factor authentication governs all API access. Database connections are encrypted at rest (AES-256) and in transit (TLS 1.3). All user actions are logged in an immutable audit trail. Penetration testing is conducted annually by an independent third party. The platform is hosted on South African government-certified cloud infrastructure (Azure Government or equivalent), with data residency restricted to South African jurisdictions in compliance with POPIA.

11.5.9 Data Storage and Output Publication

The NRMP Digital Platform employs a tiered storage architecture balancing query performance, cost efficiency, and long-term data integrity. Active operational data, current condition scores, live PSP milestone submissions, and BRE scores under active review, is maintained in hot storage within the PostgreSQL/PostGIS environment on Azure South Africa North, optimised for low-latency query response and continuous automated backup. Historical datasets superseded by annual reporting cycles migrate to warm storage, remaining queryable for retrospective analysis but not served through live API endpoints. LiDAR archives, raw survey datasets, and decommissioned document versions are held in cold storage on cost-optimised Azure Blob Storage, retained in compliance with Section 11.4.4 obligations and retrieved only for formal inspection, legal proceedings, or major asset reassessment exercises.

All schema modifications, data updates, and source metadata changes are recorded in an immutable changelog within the PostgreSQL environment, automated through the platform's workflow engine. Each dataset version carries a unique identifier, submission timestamp, custodian identity, and applied validation rules, ensuring that any BRE score, scenario output, or dashboard visualisation can be traced back to the precise data version from which it was derived.

Platform outputs are published through three channels: the live API layer serving GeoJSON, CSV, and RESTful JSON to authorised external consumers via role-based access control; the interactive dashboard providing DoT staff and the Rail Planning Office with visual access to corridor KPIs, BRE registers, and PSP milestone tracking; and formatted PDF and DOCX reports generated on demand for ministerial briefings and investor due diligence

packages. Static PDF formats are not used as primary data distribution vehicles, all authoritative data exchange between custodian entities occurs through the machine-readable API layer.

11.5.10 Stakeholder Data Rights and Obligations Management

The CIO oversees information governance within the DoT, ensuring operational, technical, and compliance alignment across all IM activities. A tiered access model, based on Open Geospatial Consortium (OGC) recommendations, structures information access:

- Tier 1: Internal users with web-based query and visualisation access.
- Tier 2: Broader departmental access to standardised geospatial datasets.
- Tier 3: Advanced sharing across departments and organisations, supporting public services and real-time data integration.

This scalable framework ensures that all stakeholders, internal and external, have appropriate access to the information they require for informed decision-making and collaboration.

11.5.11 GeoAI and Business Risk Exposure (BRE) Module

The GeoAI and BRE module is the analytical intelligence layer of the NRMP Digital Platform, translating raw infrastructure condition data into spatially referenced, monetised risk intelligence. Where conventional asset management systems produce condition inventories, the GeoAI-BRE module produces risk-prioritised maintenance decisions, answering not merely what is the state of the asset, but what is the financial consequence of that state, and what is the cost of inaction.

GeoAI, as applied here, refers to the integration of machine learning with the platform's geospatial data infrastructure, anchored to the Linear Reference System described in Section 11.5.5. In practice, the GeoAI layer processes LiDAR point cloud data, aerial imagery, and track geometry measurements to automatically extract deterioration indicators, fit asset-class-specific condition trajectory curves, and flag assets whose observed deterioration rate exceeds modelled norms. These outputs feed directly into the BRE scoring framework.

The BRE framework quantifies risk for every registered asset using two components. The Probability of Failure (PoF) is a composite index, scored between 0 and 1, derived from the asset's current condition score, its modelled deterioration rate, age relative to design life, maintenance history, and environmental exposure. The Cost of Failure (CoF) monetises the consequence of failure, incorporating the direct replacement cost, the service disruption cost per day of corridor downtime (calculated from corridor tonnage data in the knowledge base), and a Network Cascade Risk Multiplier computed by the Memgraph graph database, which identifies downstream corridor and port terminal dependencies should the asset fail. For assets within active or proposed PSP corridors, an additional concession obligation exposure multiplier is applied.

The final BRE score, computed as PoF × CoF, produces a rand-denominated risk exposure value that is directly comparable across asset classes and corridor segments. Assets are ranked by BRE score to produce a risk-prioritised maintenance register, stored in the PostgreSQL Asset and Condition Domain and refreshed quarterly for high-criticality assets. This register forms the primary evidence base for DoT's annual capital allocation process and the technical basis for infrastructure risk disclosure in PSP concession agreements. All BRE outputs are subject to human review by the Rail Planning Office before publication, preserving institutional accountability within an automated, auditable workflow.

11.5.12 AI-Driven Scenario Planning Engine

The AI-Driven Scenario Planning Engine operationalises the Triple-Leg Ontology described in Section 11.5.4, transforming the NRMP knowledge base from a passive data repository into an active strategic intelligence system. Its primary purpose is to enable DoT planners, the Rail Planning Office, and authorised concession stakeholders to interrogate the consequences of infrastructure, policy, and investment decisions across the full 20–30-year concession lifecycle, without requiring bespoke data extraction or manual modelling for each query.

Scenario Construction and Query Interface

Scenarios are initiated through a natural language query interface, backed by a LLM connected to the knowledge base via the pgvector semantic retrieval layer and the Memgraph graph traversal engine. Users pose planning

questions in plain language, for example, "What is the impact on Richards Bay coal export volumes if the Ermelo–Vryheid corridor is placed under a 40 km/h speed restriction for 18 months?", and the engine decomposes the query into structured sub-queries against the PostgreSQL, Memgraph, and pgvector layers. The LLM assembles the retrieved data into a coherent scenario narrative, accompanied by quantified outputs including projected tonnage loss, BRE score changes, and estimated revenue impact per corridor.

Validation Against Ontology Constraints

All LLM-generated scenario outputs are validated against the Leg 2 constraint set before publication. This validation pipeline enforces hard physical and commercial ceilings, corridor capacity limits, minimum maintenance intervals, concession commencement date anchors, and geophysical boundaries, preventing the engine from producing scenarios that are analytically plausible but physically or contractually impossible. Outputs that breach a constraint are automatically flagged, the violated rule is cited, and the scenario is returned for reformulation. This ensures that all published scenario outputs are defensible under technical scrutiny and suitable for inclusion in investor-facing due diligence materials.

Output Formats and Governance

Validated scenario outputs are published in three formats depending on the intended audience: structured JSON via the platform API for integration into external financial models; formatted PDF reports for ministerial briefings and Parliamentary submissions; and interactive dashboard visualisations for internal planning sessions. All outputs are tagged with the scenario parameters used, the knowledge base version at the time of generation, the constraint set applied, and a timestamp, creating a complete audit trail that supports reproducibility and institutional accountability. Write-back of approved scenario results to the knowledge base is controlled through the Rail Planning Office governance workflow, requiring human sign-off before any scenario output is treated as authoritative for planning or procurement purposes.

11.6 Conclusion and Recommendations

Conclusion

Chapter 11 has established a comprehensive, technically grounded framework for information management and digital platform governance within the NRMP. The transformation from fragmented spreadsheets and institutional silos to a unified, intelligent, continuously updated Digital Platform is not a technology project.

The platform's three most strategically significant capabilities are:

- The triple-leg ontology knowledge base, which gives DoT and its partners not just data, the ability to reason about network-wide consequences of localised events, model the long-term viability of concession structures, and interrogate the knowledge base in natural language rather than structured queries.
- BRE risk module, which replaces politically influenced, subjectively prioritised maintenance allocation with a rigorous, evidence-based, monetised risk framework. In a sector where maintenance backlogs run to tens of billions of rand, the difference between rational and irrational capital allocation is the difference between a functioning national freight system and its progressive collapse.
- The multi-concessionaire architecture, which directly addresses the governance lessons of the Gautrain precedent at national scale. By ensuring that DoT owns the Linear Reference System, sets the data submission standards, receives operational performance data through standardised APIs, and maintains an independent, continuously updated view of every concession corridor - the platform structurally eliminates the information asymmetry that has historically undermined public sector oversight of private rail operators. In a programme managing five to seven concurrent concessionaires across different commodity types and corridor geographies over 20–30-year contract terms, this architectural discipline is not an administrative convenience, it is the foundational condition for accountable, transparent, and commercially credible PSP across the full lifecycle of the NRMP concession programme.

Recommendations

The following recommendations are made for the immediate implementation period:

1. Negotiate and execute Data Sharing Agreements with Transnet (TFR, TPT, TNPA) and PRASA within the first six months of platform implementation. The Minister of Transport has statutory authority to compel data provision under the National Land Transport Act and sector-specific legislation; this authority should be invoked proactively rather than as a last resort.
2. Pilot the BRE module on the Oogies–Lephalale corridor as a proof of concept, leveraging the existing RCE study LiDAR data and track condition assessments. This pilot will validate the PoF weighting models, calibrate the CoF multipliers for South African conditions, and produce a defensible, investor-ready risk profile for the corridor's PSP transaction.
3. Mandate LRS compliance for all PSP procurement packages from the outset. Concession tender documents must specify that concessionaires are required to use DoT's LRS, report via standardised APIs, and submit data in prescribed formats as a condition of contract award.
4. Procure Esri ArcGIS Enterprise licensing through the SITA schedule, ensuring that the GeoAI extensions (including deep learning capabilities) are included, and that the licence terms support multi-concessionaire read access to the LRS without per-user licensing barriers.
5. Develop and enforce metadata standards across all data submissions, ensuring that every dataset entering the platform carries a complete ISO 19115-compliant metadata record. Without this discipline, the platform's long-term analytical value degrades as provenance information is lost.
6. Commission annual security audits aligned with ISO 27001:2013 from Year 1 and pursue formal ISO 27001 certification within three years of full platform deployment.

The realisation of the Digital Platform's capabilities is contingent on a structured, sequenced implementation programme. The following phases define the high-level trajectory for the information management and platform components described in this chapter:

Phase	Focus	Key Deliverables
Phase 1	Foundation	Execution of DSAs with Transnet and PRASA; LRS establishment on ArcGIS Enterprise; data classification and RBAC framework activation; ISO 19115 metadata standards enforced across all custodian submissions
Phase 2	Knowledge Base Build	PostgreSQL/PostGIS schema deployment; Memgraph and pgvector integration; migration of NRMP corridor, tonnage, and asset data from Excel into the centralised knowledge base; triple-leg ontology population
Phase 3	Intelligence Layer	GeoAI condition trajectory modelling activated; BRE module calibrated and piloted on the Oogies–Lephalale corridor; AI-driven scenario planning engine deployed; public-facing dashboard launched
Phase 4	Maturation and Compliance	Full multi-concessionaire API onboarding: ISO 27001 certification pursued; annual BRE refresh cycle embedded in DoT capital allocation process; platform handed over to Rail Planning Office as business-as-usual operational infrastructure

Each phase is designed to deliver standalone value while building toward the fully integrated platform. Phase 1 outputs are the structural prerequisite for all subsequent phases, without the DSAs and LRS in place, the knowledge base cannot be populated with authoritative data, and the intelligence layer has no reliable foundation on which to operate.

12 Management Strategies

12.1 Purpose of the Chapter

This chapter sets out the management strategies required to restore rail as a reliable, safe, efficient and market-responsive backbone of South Africa's transport system. It adopts a policy position that the railway must be managed as an integrated network, rather than as a collection of disconnected assets and functions. The central rationale is that stronger governance, scheduled operations, modern technology, energy efficiency, safety discipline, rational allocation of resources, and structured risk management are mutually reinforcing and must be implemented as a coherent reform package.

12.2 Strategic Intent

The table below sets out the principal strategic intentions that underpin the management of the rail system. It links each intended strategic outcome to the corresponding policy position and rationale, showing how operational reform, investment discipline, sustainability, and safety collectively support the restoration of rail as a reliable driver of economic growth and national logistics performance.

Table 12-1: Strategic Intent

Strategic outcome	Policy position and rationale
Economic recovery and growth	Rail must support export competitiveness, industrial activity and employment by providing reliable capacity between production areas, logistics hubs and ports.
System reliability	The network must transition from reactive, ad hoc "run-when-ready" practices to disciplined, schedule-driven railway operations, underpinned by robust planning, continuous monitoring, and rapid recovery capabilities.
Investment confidence	Public and private investment will only flow into the system where capacity allocation, turnaround assumptions, asset performance, and governance are demonstrably credible and measurable.
Sustainability and safety	Technology choices, traction systems, safety protocols, and security measures must collectively reduce operating risk, emissions, waste, and life-cycle costs, while enhancing overall service quality.

12.3 Policy context and governance

The management of the rail system is anchored in a clear public-sector governance framework. The DoT, as executive authority, exercises oversight over state-owned rail institutions, maintains alignment with shareholder compacts, requires credible corporate planning, and applies quarterly performance monitoring to support accountability and corrective action.

This governance framework reflects the principle that rail reform depends not only on operational measures, but also on the consistent use of governance instruments to direct strategy, define measurable outcomes, and align public investment, institutional accountability, and operational delivery across the system.

12.4 Operations Strategy

South Africa's rail network must be managed as a scheduled railway. The policy position is that fixed train paths in a robust timetable design, disciplined slot allocation in realistic infrastructure constraints, integrated service codes, real time adaptability and corridor-based planning are essential to increase throughput, reduce delays, improve predictability, ensure punctuality and protect the value of rolling stock investments. A shorter turnaround

cycle materially reduces the number of wagons and locomotives required to deliver the same tonnage, which improves returns and strengthens the case for PSP.

The Master Train Schedule must remain the core planning instrument for capacity allocation. It should define slots, crossing opportunities, recovery margins and maintenance windows, especially on single-line routes. Annual, quarterly and weekly planning cycles must be integrated so that network capacity, locomotive availability, wagon supply, crew readiness, planned occupations and seasonal changes are reflected in one operating plan.
A central planning and execution monitoring capability is required to manage the network in real time. This capability should lead annual, quarterly and weekly planning, monitor adherence to service plans, coordinate incident response, and update the operating plan as conditions change. The rationale is that a network business cannot be controlled effectively through fragmented decision-making.

Consignment life-cycle management must be treated as an end-to-end production process rather than a sequence of isolated activities. Demand capture, credit clearance, wagon ordering, loading and offloading, yard handling, mainline movement, terminal interface and empty return must be visible through an integrated workflow engine. This is necessary because customer value is created through complete and reliable delivery, not only by measuring train movements. Figure 12-1 provides an example of this process.

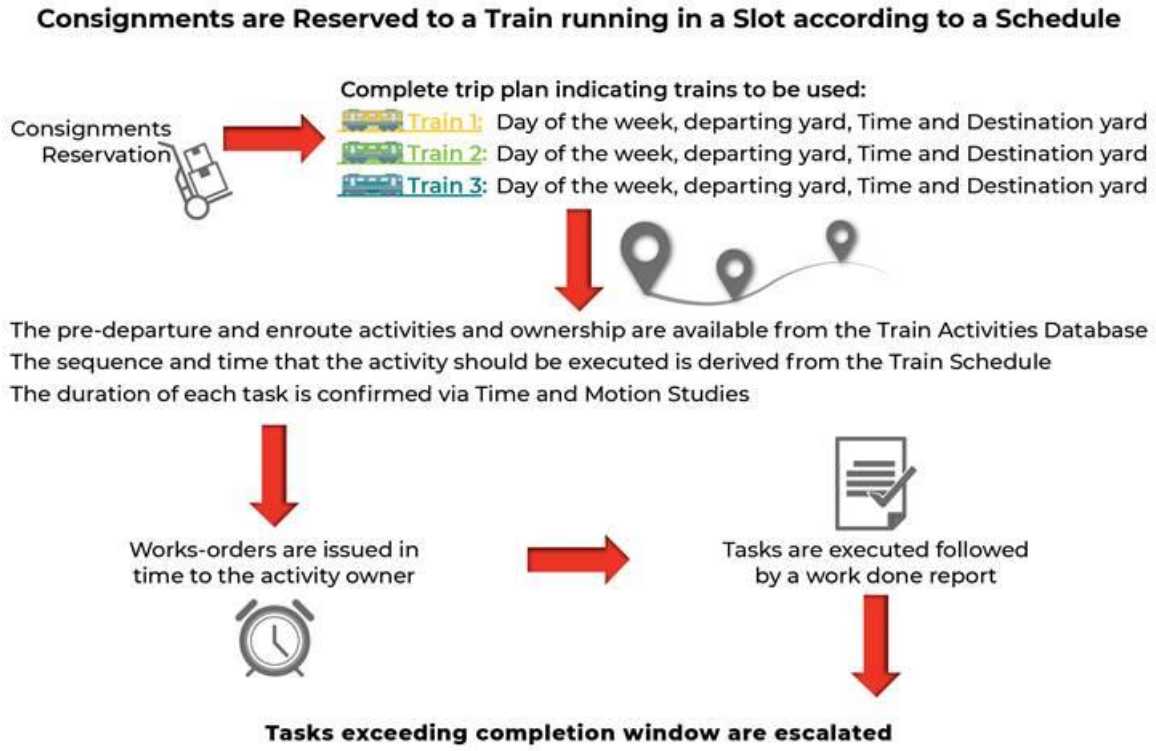


Figure 12-1: Consignment Life Cycle Management

12.5 Market Strategy

The rail sector requires a refreshed market strategy led by the DoT dedicated Rail Planning Unit. The previous market demand strategy established ambitious growth, investment and organisational objectives, but the decline in transported tonnages demonstrates that market aspiration alone is insufficient without corresponding operational recovery and institutional reform.

The policy position is that market strategy must be based on real world demand, customer needs, logistics integration, and service offerings that improve rail's competitiveness relative to road. The rationale is that rail demand grows when the network is reliable, safe and commercially responsive, and when planning, infrastructure investment and organisational design are coordinated across the sector.

12.6 Technology Modernisation

Technology adoption must be phased, practical, and aligned with network priorities. Immediate focus should be placed on proven systems that improve reliability of infrastructure, maintenance quality, asset condition visibility, train planning, security, and border efficiency, including mechanised maintenance visibly integrated into daily train schedules, predictive maintenance, continuous condition-based assessments and remote monitoring, integrated planning tools, digital customs systems, and automated wagon and train identification.

At the same time, the policy framework should retain space for future technologies such as digital twins, artificial intelligence, advanced train control, remote operations, regenerative braking, cloud-based monitoring, hydrogen applications, and robotics. This approach ensures that rail recovery is not limited to short-term improvements, but also supports a more advanced, data-driven, and lower-carbon operating model.

Strategic investment in both proven and emerging technologies is necessary to improve efficiency, reduce costs, strengthen competitiveness, and support long-term economic growth and sustainable mobility. A clear technology roadmap, supported by phased implementation, is necessary to maximise benefits while managing cost and delivery risk.

12.6.1 For Immediate Consideration

For South Africa's rail network to become more resilient and efficient, the adoption of these technologies must be prioritised. A combination of mechanised maintenance, i.e. a complete renewal of on-track maintenance capability, predictive analytics, and long-term performance-based contracts will help modernise railway operations and ensure long-term sustainability. The DoT should establish a roadmap to enable to implement these technologies, focusing on phased deployment to maximise benefits while managing costs.

Table 12-2: Technology and Systems for Consideration

Technology	Description	Benefits
Satellite Monitoring	Satellite-based monitoring is currently limited in South Africa's rail network, primarily used in some high-traffic corridors for asset tracking and security purposes.	• Real-time tracking of rolling stock and cargo movements. • Enhanced security against theft and vandalism. • Improved monitoring of environmental impacts such as flooding or land shifts. • Supports job creation in the high-tech sector and enhances security for railway workers and passengers.
GPR	GPR is not widely used in the railway sector but has been tested for perway (track foundation) inspections and tunnel integrity assessments.	• Detection of subsurface defects, focussing on sub structure, including ballast degradation and voids. • Enhanced track maintenance planning by identifying hidden issues before failures occur. • Reduces derailment risks, improving passenger and worker safety.
Ultrasonic rail inspection	Uses ultrasonic waves to detect internal flaws in rails.	• Prevents rail failures. • Enhances track safety. • Reduces maintenance costs.
Formation Condition Baselining	Currently, manual inspections dominate, with some limited use of automated systems on high-density freight corridors.	• Provides a structured database of track bed conditions. • Supports predictive maintenance by tracking deterioration trends. • Improves safety for maintenance crews by reducing the need for manual inspections in hazardous areas.

Superstructure Baselining	The assessment of railway superstructures (rails, sleepers, and fastenings) relies on manual inspections and periodic ultrasonic testing.	• Improved long-term asset management. • Reduces failures and derailment risks through data-driven interventions. • Enhances passenger confidence in rail travel by ensuring safer infrastructure.
Mechanised Maintenance Approaches	Limited mechanised track maintenance is performed on major freight corridors like the Ore Line and Coal Line. However, many sections of the network still rely on labour-intensive methods.	• Increased limited maintenance slots production, efficiency and reduced downtime. • Enhanced safety for maintenance personnel. • Greater precision in track alignments and ballast tamping. • Reduces physical strain on workers and creates opportunities for upskilling in technology-driven maintenance roles.
Condition Monitoring Measurements and Maintenance	South Africa's railway network has some condition monitoring systems for key infrastructure, but they are not widely implemented across all corridors and generally outdated.	• Early detection of faults in rail, rolling stock, and overhead traction equipment. • Modern systems also include acoustic sensing assisting in safety and security of the rail reserve. • Triggers alarms after detecting potential derailment causes. • Reduces derailments, unplanned failures and maintenance costs. • Enhances operational reliability. • Improves safety for passengers and freight operators by minimising unexpected breakdowns.
Predictive Maintenance	Predictive maintenance is in its infancy, with limited pilot programs using data analytics for asset management.	• Proactively addresses infrastructure wear before failures occur and allows preventative maintenance to be effective. • Optimises maintenance schedules to prevent unnecessary disruptions. • Increases employment opportunities in data science and maintenance analytics sectors.
Outsourcing Specialists vs. In-House Maintenance	Currently, a mix of in-house and outsourced maintenance exists, with private companies handling specialised work such as signaling and rolling stock refurbishment.	• Outsourcing allows access to international advanced skills and technology without heavy capital investment. • In-house teams ensure rapid response and network familiarity. • Encourages local enterprise development and job creation through strategic outsourcing.
Maintenance Contracts	Maintenance contracts vary by corridor, with some being ad hoc while others operate on long-term agreements. There is often a lack of performance-based contracts that incentivise efficiency.	• Long term structured contracts improve accountability and service levels. • Performance-based models can align contractor incentives with rail network reliability. • Improves working conditions for railway staff by ensuring consistent and high-quality maintenance services.
Cross-Border Digital Customs System	A proposed digitised customs system that pre-clears freight at the origin, ensuring smoother rail border crossings.	• Reduces delays at border crossings by pre-verifying cargo documentation. • Enhances security and compliance with international trade standards. • Minimises manual paperwork, improving administrative efficiency.

		• Supports integration with regional trade agreements and rail network interoperability.
Automated Wagon and Cargo Identification System	A system using RFID or GPS technology to track and verify wagon numbers and cargo details in real-time at border points.	• Speeds up customs clearance by automatically verifying cargo details. • Reduces human error and fraud in border documentation. • Enhances real-time monitoring and reporting of cross-border freight movements.
Integrated Immigration and Passenger Processing System	A system allowing seamless immigration clearance for rail passengers at departure stations instead of border checkpoints.	• Eliminates unnecessary train stops at borders, reducing overall travel time. • Improves passenger experience with streamlined entry and exit procedures. • Supports regional rail tourism and commuter travel by making cross-border trips more efficient
Integrated Train Planning Tool	A system to handle scheduling and provide feedback to yards, mainline control centres and other operators indicating train positions and expected times of arrival. It is also a workflow engine that manage the consignment lifecycle activities. Issue Works Orders to depots and yards. Records WO completion, date, and time. Updates progress status and can be used for customer feedback.	• Ability to integrate infrastructure, rolling stock and crew management into a single real time ecosystem with real time adaptability. • Reduces delays. • Improves operational efficiency by optimising scheduling. • Enhances coordination between yards, mainline control centers, and operators. • Provides real-time visibility of train positions and estimated arrival times. • Supports better resource allocation and utilisation. • Reduces conflicts and congestion on busy corridors. • Improves customer reliability and service predictability. • Enhances safety through proactive train movement management

12.6.2 For Future Consideration

The NRMP recognises that technology modernisation is essential to improving the safety, efficiency, reliability, and sustainability of South Africa's rail network. Although many of these technologies are not yet accommodated within current budgets, they remain important interventions that can strengthen network performance and support long-term sector reform.

Future technology adoption should focus on three core objectives. The first is to improve safety and reliability of the infrastructure and rolling stock through systems such as condition monitoring and advanced train control. The second is to strengthen operational performance through improved train scheduling, tracking, and more advanced traction and braking technologies. The third is to enhance sustainability through measures such as fleet modernisation, regenerative braking, improved materials, and predictive maintenance tools that reduce lifecycle costs and operational disruption.

The NRMP also acknowledges the strategic importance of emerging technologies that can position the sector for future competitiveness. These include additive manufacturing, artificial intelligence, digital twin applications, big data analytics, cybersecurity systems, hydrogen and solar energy solutions, cloud-based monitoring platforms, connectivity technologies, IoT-enabled maintenance, and advanced robotics. Collectively, these technologies provide a basis for a more resilient, data-driven, and lower-carbon rail system, and should be considered as part of longer-term planning and implementation frameworks.

12.7 Energy and Decarbonisation Position

The rail energy strategy must clearly distinguish between energy effectiveness and energy efficiency. The first requirement is to deploy the appropriate traction solution for each service and corridor. The second is to minimise waste and reduce the energy consumed per unit of output delivered. This necessitates an integrated approach in which traction selection, train design, operational discipline, regenerative braking, rolling resistance reduction, and infrastructure condition are considered in combination.

Electric traction remains central to the network, particularly on heavy-haul and higher-density corridors, because it offers significantly better transmission efficiency than diesel traction and creates stronger opportunities for emissions reduction when combined with cleaner electricity supply. Diesel traction remains relevant where electrification is absent, unreliable or economically unjustified, but the long-term policy direction should support more efficient traction, cleaner fuels, energy storage and operational practices that reduce unnecessary energy use.

The wider rationale is that rail is structurally more energy efficient than road and is therefore a critical instrument for reducing freight and passenger transport emissions. Energy policy for rail must therefore support road-to-rail migration, efficient fleet deployment, renewable energy integration, and procurement decisions that prioritise life-cycle performance rather than narrow upfront cost.

12.8 Safety, Safety Management and Security

Safety and security are fundamental to the effective functioning of the rail system and should be managed as integrated elements of network performance, public confidence, and long-term sustainability. They should extend across people, infrastructure, rolling stock, operations, maintenance, technology, and organisational culture. A formal approach to safety management, supported by risk control, competent personnel, operational discipline, and targeted security interventions, is essential to protect the network, restore capacity, and ensure reliable service delivery.

Table 12-3: Safety Statement

Subheading	Policy Statement
Integrated Safety Framework	Safety is a foundational requirement of the rail system and should be managed as an integrated, system-wide function. It should encompass people, infrastructure, rolling stock, operations, maintenance, technology, and organisational culture, and should be embedded across the full lifecycle of railway planning, operation, renewal, and change. Safety management should not be treated as a discrete compliance exercise, but as a core condition for network access, operational continuity, public confidence, and long-term sector sustainability.
Safety Management System	A formal Safety Management System should provide the framework through which safety is governed, implemented, monitored, and continuously improved. This system should define safety policy, leadership accountability, organisational responsibilities, operational rules, competence requirements, hazard identification processes, risk controls, assurance arrangements, incident reporting, corrective action procedures, and review mechanisms. It should also ensure that safety is integrated into operational planning, train control, engineering, maintenance, possession management, and change management, so that risk is addressed proactively rather than only after failure or disruption has occurred.

Subheading	Policy Statement
Leadership, Competence and Operational Discipline	Effective safety management should require clear institutional leadership and disciplined execution at every level of the railway system. This should include the establishment of defined authority structures, safe working procedures, performance monitoring, workforce participation, and management review. Safety-critical functions, including train operations, train control, maintenance, inspection, and supervision, should be supported by appropriate competence standards, training pathways, certification requirements, and ongoing skills assurance. Safe railway performance depends not only on the existence of rules, but on the capability of personnel to apply them consistently and on the ability of institutions to enforce them effectively.
Risk Management and Assurance	Risk management should form an integral part of railway operations. Safety risk should be identified, assessed, controlled, monitored, and reviewed through structured processes that cover infrastructure condition, rolling stock reliability, operational interfaces, human factors, technology applications, maintenance practices, and emergency response. This approach should support the early identification of hazards, the prevention of incidents, and the systematic reduction of operational exposure across the network. Safety assurance should therefore combine technical control, operational discipline, competent personnel, and reliable information in a single management framework.
Safety Culture	Safety culture is essential to the durability of this framework. A safe railway system should be supported by an organisational culture in which compliance, vigilance, reporting, learning, and accountability are embedded in daily practice. Personnel at all levels should understand their safety responsibilities, act within defined procedures, report hazards and deviations without delay, and contribute to the continuous strengthening of operational safety. Leadership should reinforce this culture through visible commitment, regular review, timely intervention, and alignment between stated policy and operational practice.
Security as a Strategic Requirement	Safety and security should be managed as interdependent components of a resilient rail system. The protection of infrastructure, train operations, personnel, passengers, freight, and the rail reserve is essential to safe and reliable service delivery. Security failures such as theft, vandalism, sabotage, trespass, and encroachment have direct operational consequences, including service disruption, reduced asset availability, increased maintenance costs, damage to public confidence, and constraints on capacity recovery. Security management should therefore be treated not as a secondary support function, but as a strategic requirement for restoring and sustaining network performance.
Corridor-Based Protection Measures	A corridor-based approach to safety and security management should be applied across the network. Priority freight corridors, metro lines, stations, yards, terminals, high-risk commodity flows, and critical infrastructure assets should be subject to targeted protection measures aligned to their risk profile and operational importance. These measures should include visible security deployment, surveillance systems, fencing, access control, intrusion detection, protection of signalling and electrical assets, and active management of encroachment and unlawful occupation. Interventions should be differentiated by corridor and asset type so that resources are directed to the locations and threats with the greatest safety and operational consequences.
Contribution to Network Recovery	The restoration of rail capacity and service reliability depends on the combined strength of safety management and security control. A railway system cannot achieve dependable performance, attract sustained demand, or support higher utilisation where infrastructure insecurity, theft, vandalism, and unsafe operating conditions continue to undermine network availability. For this reason, safety, safety management, and security should be treated as strategic enablers of operational recovery, investment confidence, and long-term system modernisation.

12.9 Improvement, Efficiency and Rationalisation

The railway must pursue continuous improvement as a management discipline. Scheduled operations, process control, performance review, standard methods, and the structured use of improvement tools must become normal practice across the sector. Efficiency should be understood not merely as cost reduction, but as better use of capacity, assets, labour, energy and time to improve service quality and financial performance.

Rationalisation is required to direct scarce resources toward the parts of the network that can deliver the greatest public and economic value, while still protecting strategic optionality. The policy position is that corridors, services and assets should be evaluated against demand, economic purpose, social function, maintenance burden and long-term network role.

12.10 Risk Management and Implementation Discipline

Risk management must be embedded in all aspects of network planning and operation. Risks should be identified, rated, controlled and monitored through a formal framework that considers consequence, likelihood and control effectiveness. The purpose is not only to record risk, but to drive action, prioritise interventions and strengthen resilience across the network.

The management strategies set out in this synopsis should therefore be implemented through a sequenced programme that links governance reform, operating model transition, technology deployment, safety and security interventions, energy measures and corridor prioritisation. This ensures that the railway is rebuilt through disciplined execution rather than fragmented initiatives.

12.11 Conclusion

The national rail system must be managed as an integrated network that combines governance discipline, scheduled operations, customer-responsive market planning, modern technology, energy efficiency, safety assurance, security protection, rational investment and structured risk management. None of these elements can deliver their full value in isolation.

The core rationale is that rail recovery is not only an infrastructure challenge. It is a management challenge. The success of reform depends on whether the sector can move from fragmented and reactive practices to a coordinated operating model that is measurable, investable and capable of sustaining economic growth, logistics competitiveness and social value over the long term.

13 Training and Development

The revitalisation of South Africa's rail sector requires more than investment in infrastructure, rolling stock and institutional reform. It requires a coordinated and long-term commitment to skills development, institutional capability and human capital formation across the entire rail sector. This chapter outlines the proposed national framework through which the DoT, working with other spheres of government, state-owned entities, regulators, operators, educational institutions and the private sector, will rebuild the rail skills base required to support successful implementation of the NRMP.

13.1 Introduction and Context

South Africa's rail sector is entering a period of substantial transition. Government is pursuing open access, concessioning, increased private sector participation, economic regulation, freight rail reform, and passenger rail modernisation. These reforms will require a significant increase in technical, operational, regulatory and managerial capability across the sector.

Over the past three decades, the rail sector has experienced a sustained erosion of institutional capability and specialist skills. Many experienced engineers, technicians, artisans and operators have retired or left the sector, while graduate recruitment, apprenticeships and structured training programmes have declined. This has contributed to shortages in track maintenance, signalling, rolling stock maintenance, traction systems, operations control, rail economics, concession management and safety oversight.

The DoT recognises that infrastructure investment alone will not be sufficient to revitalise the rail sector. The long-term success of the NRMP will depend on whether South Africa is able to rebuild the broader rail skills ecosystem across national departments, municipalities, state-owned entities, regulators, operators, universities, Technical and Vocational Education and Training (TVET) colleges and the private sector.

Training and development must therefore be treated as a strategic national intervention rather than a standalone human resources programme. It must support the full rail reform agenda, including infrastructure expansion, concessioning, open access, localisation, digital transformation and increased private sector participation.

13.2 Policy and Legislative Context

The DoT will align all rail skills development interventions with existing national legislation, policy directives and strategic plans.

The Skills Development Act, 1998 provides the legislative basis for skills planning, learnerships, workplace training and the role of Sector Education and Training Authorities. In the transport sector, Transport Education Training Authority (TETA) remains the principal coordinating institution for skills planning, occupational qualifications and training support.

The National Qualifications Framework Act, 2008 provides the basis for nationally recognised and quality-assured qualifications. The DoT will work with South African Qualifications Authority (SAQA), Quality Council for Trades and Occupations (QCTO), universities and TVET colleges to ensure that rail-related qualifications are aligned with emerging sector needs.

The National Skills Development Plan 2030 identifies transport and logistics as priority sectors for technical and occupational skills development. The White Paper on National Rail Policy, 2022 further recognises that rail reform requires significant institutional strengthening, technical capability and specialist skills across the public and private sectors.

The Economic Regulation of Transport Act, 2024 introduces a future regulatory environment that will require new skills in economic regulation, access charging, tariff setting, concession management, contract oversight and competition matters. Similarly, the Railway Safety Act, 2024 introduces additional requirements relating to safety permits, safety critical grades, training institutions, safety management systems, occurrence investigations and railway safety standards.

The DoT will therefore ensure that future rail training programmes are aligned with these policy and legislative developments.

13.3 Strategic Rail Skills Challenges

South Africa faces a number of structural skills challenges that may constrain implementation of the NRMP if not addressed.

The rail sector currently experiences shortages in permanent way engineering, signalling, train control systems, traction systems, rolling stock maintenance, rail operations, safety management, economic regulation and digital systems.

A further challenge is the ageing profile of the rail workforce. Many experienced technical specialists are approaching retirement age, while younger professionals are not entering the sector in sufficient numbers. This is particularly evident in artisan trades such as welding, fitting and turning, boiler making, electrical systems, diesel mechanics, overhead traction systems and track maintenance.

The Department also recognises that there are growing shortages in non-traditional rail skills. These include rail economics, public-private partnerships, concession management, access charging, transport modelling, GIS, cybersecurity, predictive maintenance, digital signalling and data analytics.

Without targeted intervention, these shortages may delay infrastructure delivery, reduce investor confidence, constrain PSP and weaken the ability of the public sector to manage reform.

13.4 Public Sector Capability and the Rail Planning Unit

The Department will establish and strengthen a dedicated Rail Planning Unit to support the implementation, monitoring and long-term maintenance of the NRMP, in line with the White Paper on NRP. The White Paper identifies the Department as the lead institution responsible for driving rail revitalisation, developing the NRMP, and thereafter monitoring and evaluating policy implementation across the sector.

The Rail Planning Unit will therefore serve as the Department's central institutional capability for rail policy coordination, strategic planning, performance monitoring, investment prioritisation, intergovernmental coordination and implementation oversight. The Unit will support the Department in fulfilling its role as sector coordinator across PRASA, Transnet, provincial governments, municipalities, the RSR, the future Transport Economic Regulator and private rail operators.

In line with the White Paper on NRP, the Rail Planning Unit should focus on ensuring alignment between the NRMP, the Freight Logistics Roadmap, provincial and municipal transport plans, freight logistics strategies, concessioning programmes and future rail investment priorities. The Unit should also support Government in monitoring the implementation of open access, network reforms, infrastructure investment programmes, devolution initiatives and private sector participation.

The Rail Planning Unit should include the following functional areas:

- Rail Policy and Institutional Reform.
- National Rail Master Planning and Investment Prioritisation.
- Freight and Passenger Rail Monitoring.
- Data, GIS, Rail Intelligence and the Rail Data Bank.
- Economic Regulation and Competition Oversight.
- PPPs, Concessions and Private Sector Participation.
- Rail Safety and Regulatory Coordination.
- Provincial and Municipal Rail Support.
- Stakeholder Engagement and Intergovernmental Coordination.
- Skills Development, Knowledge Management and Research.

The DoT has already established the Interim Rail Economic Regulatory Capacity within the Department as a precursor to the future Transport Economic Regulator. Once the Transport Economic Regulator is established,

the Department will continue to require internal capability to monitor regulatory performance, assess policy alignment, support the Minister and coordinate economic regulation matters across the sector. This oversight role should remain within the Rail Planning Unit through a dedicated sub-function focused on economic regulation, competition oversight and regulatory coordination.

The Department will therefore require personnel with skills in transport economics, competition regulation, tariff structures, access charging, concession management, contract oversight, dispute resolution, infrastructure pricing, project appraisal, cost-benefit analysis, GIS, rail planning, stakeholder coordination and regulatory impact assessment. This internal capability is important to ensure that the Department remains an informed client, coordinator and policy leader, rather than relying entirely on external technical support.

13.5 National Rail Skills Development Framework

The NRMP will establish a National Rail Skills Development Framework as a central component of the NRMP implementation programme. The framework will provide a coordinated national approach to rail-related skills development across government, state-owned entities, regulators, municipalities, operators, concessionaires and the private sector.

The framework will be structured around eight strategic pillars.

Pillar 1: Technical and Artisan Development

The Department will work with TETA, TVET colleges, PRASA, Transnet, OEMs and private operators to rebuild artisan development pathways. This will include apprenticeships, trade testing, workplace learning and accredited training in permanent way maintenance, signalling, rolling stock maintenance, traction systems, welding, boilermaking, fitting and turning, electrical systems and diesel mechanics.

Pillar 2: Graduate and Professional Development

The Department will support bursaries, internships, graduate programmes, mentorships and professional registration pathways for engineers, planners, economists, GIS specialists, project managers and legal professionals. Graduate development programmes should be linked to future rail projects, concessioning programmes and infrastructure investments.

Pillar 3: Rail Safety and Regulatory Competency

The Department, together with the Railway Safety Regulator, will support specialised training in safety permits, safety critical grades, signalling, train operations, dispatching, incident investigations, safety management systems and compliance monitoring.

Pillar 4: Leadership and Management Development

The Department will support management and leadership programmes focused on project management, programme management, PPPs, concessioning, stakeholder management, commercial negotiations and intergovernmental coordination.

Pillar 5: Digital and Fourth Industrial Revolution Skills

The Department will promote training in GIS, data analytics, digital signalling, predictive maintenance, remote monitoring, cybersecurity, digital twins, artificial intelligence and rail technology systems.

Pillar 6: Public Sector and Municipal Capability

The Department will work with provinces and municipalities to strengthen capability in rail planning, station management, contract oversight, devolution, concession management and intergovernmental coordination.

Pillar 7: Transformation, Inclusion and Youth Development

The Department will ensure that women, youth, persons with disabilities and historically disadvantaged groups are prioritised in rail training programmes.

Pillar 8: Research, Innovation and Centres of Excellence

The Department will support partnerships with universities, TVET colleges, research institutions and the private sector to establish centres of excellence focused on rail technology, rail economics, freight logistics, passenger rail, safety and digital systems.

13.6 Priority Training Areas

The following training areas should be prioritised across the rail sector:

- Permanent way engineering and track maintenance.
- Signalling and train control systems.
- Rolling stock engineering and maintenance.
- Locomotive and EMU maintenance.
- Overhead traction and power supply systems.
- Telecommunications systems.
- Train operations and dispatching.
- Rail safety and accident investigation.
- Security, vandalism prevention and emergency response.
- Rail economics and competition regulation.
- Tariff setting, access charging and infrastructure pricing.
- PPPs, concessions and contract management.
- GIS, data analytics and digital rail systems.
- Predictive maintenance and remote monitoring.
- Freight logistics, inland terminals and intermodal systems.
- Station management and customer service.
- Climate resilience, sustainability and decarbonisation.

These training areas should be updated periodically to align with evolving technologies, policy reforms and industry demand.

13.7 Structured Skills Transfer and Delivery Mechanisms

The Department will implement a range of structured delivery mechanisms to support skills transfer and capability development.

These mechanisms will include:

- Apprenticeships and learnerships.
- Graduate and internship programmes.
- Mentorships and succession planning.
- Professional registration support.
- Scholarships and bursaries.
- Workplace-based learning.
- Secondments between institutions.
- Exchange programmes with international rail organisations.
- Research partnerships and industry placements.
- Digital learning platforms and remote training.

The Department will also require that concession agreements, PPP arrangements and private sector contracts include obligations relating to localisation, technology transfer, training, mentorships and skills development.

Skills transfer should form part of all major rail investment programmes and should be monitored as part of concession performance agreements and operator reporting obligations.

13.8 Strategic Partnerships and Centres of Excellence

The DoT will establish strategic partnerships with universities, TVET colleges, PRASA, Transnet, private operators, OEMs, Sector Education and Training Authorities (SETAs), research institutions and international rail organisations.

Government will support the establishment of specialised centres of excellence focused on:

- Freight rail operations.
- Passenger rail systems.
- Rolling stock engineering.
- Signalling and train control.
- Rail safety and occurrence investigations.
- Rail economics and regulation.
- Digital systems and innovation.
- Logistics and intermodal planning.

Existing facilities such as the Transnet School of Rail, PRASA training facilities, university rail research centres and OEM academies should be leveraged and expanded.

The Department should also explore opportunities for collaboration with international rail institutions in Europe, Asia, Australia and other African countries to support knowledge transfer and benchmarking.

13.9 Transformation, Inclusion and Youth Development

The Department will promote transformation and inclusion across the rail sector by increasing participation by women, youth, persons with disabilities and historically disadvantaged groups.

Training programmes should include clear participation targets and minimum thresholds for representation. Particular focus should be placed on increasing female participation in technical disciplines such as engineering, signalling, rolling stock maintenance, operations control and rail economics.

Government should also promote rail careers through schools, TVET colleges and universities to encourage greater youth participation in the sector.

13.10 Monitoring, Reporting and Governance

A monitoring and reporting framework will be established to track implementation of the National Rail Skills Development Framework.

Key indicators should include:

- Number of artisans trained.
- Apprenticeships and learnerships completed.
- Graduate placements and bursaries awarded.
- Professional registrations achieved.
- Participation by women, youth and persons with disabilities.
- Number of accredited training programmes established.
- Skills transfer outcomes from PPPs and concessions.
- Scarce skills vacancy levels.
- Municipal and provincial capability improvements.
- Training expenditure by operators and concessionaires.

The Department will publish periodic progress reports to track implementation and identify areas requiring additional intervention.

13.11 Conclusion

The revitalisation of South Africa's rail sector depends not only on infrastructure investment, rolling stock renewal and institutional reform, but also on the development of the people and organisational capability required to support a modern railway system.

The DoT will therefore treat rail skills development as a strategic national priority. Through the National Rail Skills Development Framework, the Department will coordinate a long-term and sector-wide programme of training, institutional strengthening, skills transfer and capability development.

This framework will support the successful implementation of rail reform, increase investor confidence, strengthen public sector capability and ensure that South Africa is able to develop and retain the skills required to support a modern, competitive and sustainable rail sector.

14 Rail Funding

14.1 Introduction

The NRMP recognises that developing a robust, sustainable, and inclusive rail sector in South Africa requires a strategic framework that aligns funding and financing mechanisms with policy objectives, economic growth goals, and social needs. This chapter has been written with input from various other chapters namely chapters 3, 8, and 10,

14.2 Rail Funding History and Framework

Rail funding in South Africa has historically been shaped by strong state intervention, reflecting the strategic and developmental role of rail in the national economy. Rail systems (passenger and freight) were originally established as state-owned entities, primarily due to the capital-intensive nature of rail infrastructure and rolling stock, the long asset life cycles, and the significant barriers to market entry. These structural characteristics necessitated substantial public sector funding through direct investment, sovereign support, and, where required, fiscal transfers from the national treasury.

From inception through much of the 20th century, rail funding and pricing were aligned with broader socio-economic and developmental objectives rather than strict commercial principles. The former South African Railways and Harbours (SAR&H) operated under a mandate to support economic development, regional integration, and export competitiveness. Tariff structures were therefore based on the principle of "what the traffic can bear," resulting in widespread cross-subsidisation. Lower tariffs were applied to strategic sectors such as agriculture and mining to enable their viability, while higher tariffs were imposed on manufactured goods and other commodities capable of absorbing increased transport costs. Port revenues were also utilised to subsidise rail operations.

This cross-subsidisation model allowed the rail system to remain financially sustainable over extended periods while fulfilling its developmental mandate. Railways also functioned as common carriers, obligated to transport goods irrespective of profitability considerations. As a result, funding requirements were influenced not only by operational needs but also by broader socio-political objectives, including employment creation, skills development, and regional access. Public investment in rail was therefore treated as a long-term socio-economic investment rather than a purely financial undertaking.

Prior to the 1930s, the absence of significant competition enabled this model to function effectively. However, the emergence of road transport introduced structural changes to the transport funding and competitive landscape. Road transport offered operational advantages, including flexibility, door-to-door service, and lower handling requirements. In response, government implemented regulatory measures to protect the rail sector, including restrictions on road transport operating distances and vehicle capacities. These measures effectively preserved rail's market share and sustained its funding model.

Over time, increasing pressure from the road transport industry and broader economic shifts led to the gradual relaxation of these regulatory protections. The transition to a deregulated transport market, formalised through the Transport Deregulation Act of 1988, fundamentally altered the funding environment for rail. Road transport operators were able to compete more effectively, particularly in high-value freight segments that had historically subsidised other rail services. This resulted in a significant erosion of rail market share and a corresponding decline in revenue available to sustain cross-subsidisation.

The deregulated environment placed the rail sector under sustained financial pressure. Rail systems that remained viable were those serving high-density corridors and long-distance bulk transport, where rail retained a structural advantage. Conversely, lower-density routes and services became financially unsustainable, leading to network contraction and reduced service levels. Declining revenues further constrained the ability of rail operators to maintain infrastructure and rolling stock, creating a cycle of deteriorating service quality and reduced competitiveness.

Institutional arrangements also contributed to funding imbalances. Rail operators, including successors to SAR&H such as TFR and the PRASA, remained vertically integrated and responsible for both operations and

infrastructure maintenance. In contrast, the road sector operated under a vertically separated model, with infrastructure funded and managed by public entities, while private operators utilised the network with relatively limited direct infrastructure cost obligations. This structural disparity placed rail at a competitive disadvantage and increased its reliance on state support.

Passenger rail services, in particular, continued to depend on government subsidies to address the gap between operating costs and fare revenues. However, such subsidies were frequently insufficient to fully meet funding requirements, contributing to ongoing financial and operational challenges.

In the contemporary context, these historical dynamics underpin the need for a reformed rail funding framework. The legacy of cross-subsidisation, declining market share, infrastructure backlogs, and institutional inefficiencies necessitates a transition toward a more diversified and sustainable funding model. The NRMP supports the current South Africa policy directives with regards to a rail funding framework that is based on the continued role of targeted public funding, as well as the introduction of PSP through mechanisms such as Private Sector Participation (PSP), concessions, and alternative financing structures.

Accordingly, current policy positions recognise that effective rail funding requires a balanced approach that addresses historical structural constraints while enabling improved efficiency, competitiveness, and investment mobilisation. The evolution of rail funding in South Africa thus informs the policy direction toward targeted state support, institutional reform, and increased PSP, as outlined in the preceding sections.

The funding plan section of the NRMP addresses the possible funding options for the freight and passenger businesses.

The NRMP recognises the necessity of targeted state funding for rail infrastructure upgrades. Such funding shall be directed, where feasible, to an independent IM or designated State Agency rather than to train operators, in order to minimise market distortions. Public funding allocations shall be linked to measurable outcomes, including reductions in access charges and/or improvements in operational efficiency for rail operators.

In addition to the above, the rail funding strategy also considers the following:

- The complex, multi-network and multi-operator structure of the South African rail system.
- Government policy objectives and positions relating to the funding of state-owned railways.
- Applicable financial thresholds and borrowing limitations across rail networks and operators.
- Approved institutional arrangements and organisational structures.
- The funding capacity of all stakeholders, including both public and private sector participants.
- The availability of equity from project sponsors and capital markets.
- Appropriate debt structuring mechanisms.
- The application and suitability of PSP models.
- The establishment of a clear and credible financial value proposition to support investment by both government and the private sector in rail infrastructure and rolling stock.

14.3 Funding Drivers

Rail funding shall be sourced through a combination of public and private mechanisms. Traditional funding instruments, including loans, grants, bonds, export credits, and sovereign support, shall remain integral components of the rail funding framework. In alignment with national rail policy, provision is made for increased PSP in the rail network and associated rail services. Private sector funding mechanisms shall be considered and, where appropriate, implemented across the following categories:

- Privatisation
- PPPs and concessions
- Rolling stock leasing
- Outsourced rail maintenance

PSPs is recognised as a preferred mechanism for mobilising additional funding. For the purposes of this policy, a PSP is defined as a long-term contractual arrangement between a government entity and a private party for the provision of a public asset or service, wherein the private party assumes significant risk and management responsibility, and remuneration is linked to performance outcomes. PSPs shall constitute formal contractual

relationships in which private entities finance, deliver, and operate public services using capital assets, with associated risks shared between the parties.

Rail concessions can be classified into the following categories based on the component of the railway being financed:

- Private monopolistic vertically integrated railways, where a single operator owns, builds, and maintains all rail infrastructure.
- Privately shared-use vertically integrated railways, where infrastructure is owned and maintained by a single operator with mandated third-party access.
- Below-rail service providers, where infrastructure operators provide access to rolling stock operators on a user-pay basis.
- Above-rail service providers, where operators provide passenger and/or freight services on infrastructure not owned by them.

PSPs and concessions shall be structured to achieve the following outcomes:

- Enable the divestment of specified rail corridors by the State and/or Transnet, thereby reducing future financial obligations.
- Facilitate competitive market dynamics in the operation of monopoly rail assets.
- Maximise opportunities for additional PSP and investment.
- Reduce the burden of fixed assets and long-term debt on the public sector, thereby enabling reinvestment in infrastructure.
- Provide for periodic reallocation of concessions at the end of contract terms to enable new partnerships and contractual arrangements.

A uniform funding approach shall not be applied across all rail interventions. Funding strategies shall be differentiated and aligned to the specific characteristics of each intervention. Allocation of funding sources, including private investment, pay-as-you-go mechanisms, and public sector debt, shall be determined based on commercial viability and developmental or economic impact. All funding and financing interventions shall be designed and implemented in accordance with these principles.

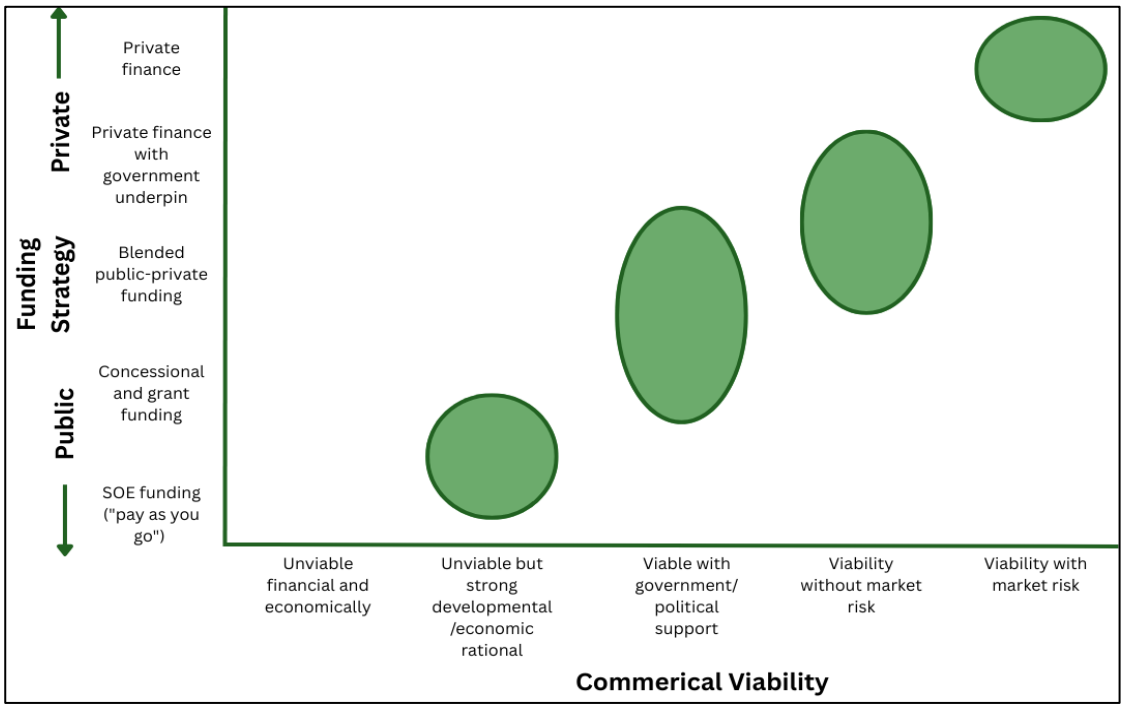


Figure 14-1: Funding Visibility Spectrum

Some of the underlying causes, which have made private sector financing less than effective in the past have included:

- misconceptions about private sector investments and financing.
- poor understanding of risk factors.

- misaligned incentives and interests of major stakeholders.
- public expectation for below-cost prices.
- lack of credibility in government commitments, often resulting from the lack of consensus within the government.
- corruption and imbalance in deal structure and equity distribution; and
- inflated needs assessment for new infrastructure ("white elephant syndrome").

The effectiveness of private sector financing shall be safeguarded through the mitigation of the following risks and constraints:

- Misconceptions regarding private sector investment and financing models.
- Inadequate assessment and allocation of risk.
- Misalignment of incentives among key stakeholders.
- Public expectations of below-cost pricing for services.
- Insufficient credibility and consistency in government commitments.
- Governance failures, including corruption and inequitable deal structures.
- Overestimation of infrastructure demand leading to underutilised assets ("white elephant" syndrome.

14.4 Proposed Funding and Finance Framework for the NRMP

The proposed funding and finance framework for the NRMP is premised on a framework that is based on 4 pillars. Each pillar has its own objective and funding mechanism(s).

Pillar 1: Public Sector Funding

Objective: Ensure baseline funding for capital investment and operational subsidies, particularly for socially critical passenger services.

Mechanisms:

Annual allocations from the National Budget for infrastructure development and subsidies.
Integration with the Public Transport Strategy and alignment with the NDP.
Subsidy Reforms to improve targeting and reduce operational inefficiencies.

Pillar 2: Private Sector Participation

Objective: Attract private capital and expertise to improve efficiency, reduce the financial burden on the state, and enhance service quality.

Mechanisms:

Public-Private Partnerships (PSPs) for infrastructure development, operations, and maintenance.
Securitisation of loans and bridging finance for investment projects.
Concession Agreements for freight corridors and high-capacity passenger routes.

Pillar 3: Innovative Financing Mechanisms

Objective: Leverage innovative financing to diversify funding sources and align with sustainability goals.

Mechanisms:

Green Bonds for rail electrification and sustainable infrastructure development.
LVC to monetise increased property values near rail infrastructure.
Infrastructure Funds with contributions from institutional investors and pension funds.
Tax Increment Financing (TIF) to capture future increases in property taxes near rail corridors.

Pillar 4: International and Development Funding

Objective: Access low-cost capital and technical expertise from international development partners.

Mechanisms:

Loans and grants from multilateral institutions such as the World Bank, African Development Bank (AfDB), and BRICS New Development Bank. Participation in regional infrastructure initiatives like the African Continental Free Trade Area (AfCFTA) and SADC Regional Infrastructure Development Master Plan.

The fundamental difference between public- and private sector ownership of infrastructure is related to the way the return on the investment is determined. Governments at all levels are concerned with the macro impact that an investment in infrastructure has on the economy of a geographic region. Venture capitalist, institutional

investors, corporations, and companies in general are primarily focused on financial consequences of their investment. For this reason, the rail infrastructure in South Africa remains under state ownership, though there is the potential for greater PSP in operations, infrastructure upgrades and maintenance and related rail services.

The NRMP acknowledges the necessity of targeted state funding for infrastructure upgrades, ideally with an independent IM or State Agency as recipient, rather than train operators, to minimise market distortions. Public funding should be tied directly to a reduction in access charges or greater efficiency for rail operators.

14.5 Total Cost of the Draft NRMP

The total cost of Draft NRMP projects to restore rail as backbone of the country's logistics and mobility system is R1.9 trillion. To put this cost in perspective, it is useful to consider it in relation to South Africa's current GDP of R7.3 trillion. Implementation is likely to be spread over a decade, thus R190 billion per year, or 2.6% of GDP. It is important to analyse this funding need against the relative benefits of an improved rail network in South Africa and how much the annual GDP benefit would be.

As per an independent study by the Gain Group the current annual losses to South Africa's economy due to its rail challenges amount to R276 billion or 3.6% of the GDP. They comprise R177 billion lost due to exports that should have happened but not realised, and the forex was not created, plus R99 billion lost due to inefficiencies of freight that should have been moved on rail but was moved on road at higher cost to the economy. Of this amount, in the freight sector, an initial shift of 60 million tons per annum to rail will bring about at least R 38 billion savings to clients and the economy due to reduced transport costs as well as savings in indirect costs related to issues such as emissions, congestion and security.

From a risk perspective, public sector CAPEX currently runs at 3.2% of GDP. It is improbable that rail could appropriate ≈70% of that, so the shortfall will have to be attracted from private sector investors. In the aftermath of a period in which the railway was run to failure along with corruption, until the fiscus declared its incapacity to provide further support, it should be expected that such investors would require exceptional measures to reduce their investment risks to a tolerable level.

14.6 Rail Specific Projects in South Africa

The NRMP process has analysed a range of possible projects that could be implemented in South Africa's rail network and prioritised them using a detailed methodology. This analysis and prioritisation are presented below:

Table 14-1: Strategic Areas for Funding Analysis

Strategic Areas	Demand in Market	Funding needed	Best Source of Funding
Current network and capacity (with backlog included)	High volume demand for minerals and bulk ores	Copex and backlog CAPEX on the two ore corridors and Hotazel to Gqeberha line	PSP's and private sector bridging finance
Current GFB network fixed	Demand to rail intermodal and manufactured goods	To revitalise the Container, Central and CapeCor	BFIs/subsidies, government funding, TRIM funds
Current Commuter Network fixed	Demand to move commuters in metropolitan and peri-urban areas	To repair and upgrade lines and to acquire new rolling stock	Subsidies, DFI funds, sovereign funds, rolling stock leasing
Current network expanded and densification	Demand for Waterberg coal and chrome and manganese	To upgrade the mineral lines soon and maybe in future some GFB lines	PSP's and DFI's, as loan security is vested in volume to be moved
Current Rolling Stock Fleet modernised and augmented	Demand from industry to use rail in various commodity groups as network is upgraded	To acquire modern locomotives, wagons and to renew and make use of current national fleet	Private Sector investment, PSPs via ROSCOs, DFI and bank funding

Where it will make sense to bring in RRT rail	Demand for passengers and high value goods	To build new lines and rolling stock on standard-gauge	International Funding, Concessions with SA Government Guarantees
B-network resolution	Regional and local demand	Re-instate or upgrade lines	Local financing, provincial and municipal grants, PSPs

Based on this a summarised list of projects to be invested within was prepared for further analysis and scenario testing plus Cost Benefit Analysis process was followed. These projects are listed here:

Table 14-2: Project List for Rail network and some Operations

ID	Project Type	Segment	Project	Primary Parties	Reason	Potential Funding Method
1	Brownfields	Greenview to Emahlaleni	Reinstate operations	TRIM and Maputo Clients	To bypass Sentrarand, open Maputo Corridor	Blended Finance Capital Project
2	Brownfields	Greenview to Sentrarand	Freight Ring Doubling	TRIM	Create Capacity	Corporate Funding by SOE
3	Brownfields	Lephalale to Pyramid South	Double Dam to De Wildt, Boshoek loop. Extend and add turf ground loop	TRIM and Coal Clients	Waterberg and Botswana Coal Capacity to 24 mtpa	Securitisation Funding, supported by Waterberg and Botswana clients
4	Brownfields	Rustenburg to Bayview	150 wagon Chrome train from Pendoring Compilation Yard	TRIM, Coal and Chrome clients	To move more chrome from Western Bushveld complex	Securitisation Funding, supported by chrome clients
5	Brownfields	Phalaborwa to Bayview	More 80 wagon Magnetite trains from Phalaborwa	TRIM and Magnetite Exporters	Increase magnetite volumes	Project Funding
5	Brownfields	Phalaborwa to Bayview	160 wagon Magnetite train from Phalaborwa to Komatipoort - 50/50 split there to RB and Mozambique	TRIM and Magnetite Exporters	Increase magnetite volumes	Concessional funding or debt underpin by South African and Eswatini governments
6	Brownfields	All	Reinstate Network Condition 70bn	TRIM	To bring volumes on network back to 250 Mtpa	Mixture of Government Funding, Concessional Debt and Government Debt Underpin
7	Brownfields	Container Corridor	15 Min Headways, 75 Wagon Trains, 100 wagon option with substation upgrades and loop extensions	TRIM and Container clients	Increase volume on the Container Corridor	Blended Project Financing
8	Brownfields	Hotazel to Sishen	30 tons axle load	TRIM and Manganese clients	Allow 30 ton per axle for manganese clients	Securitisation funding or PSP/concession to a party

ID	Project Type	Segment	Project	Primary Parties	Reason	Potential Funding Method
9	Greenfields	Hotazel to Sishen	Compilation yard at/or near location of Direct Link and/or expansion of Sishen Yard	TRIM and Manganese clients	Allow 30 ton per axle and separates manganese operations from iron ore	Concession
10	Brownfields	Hotazel to De Aar	More 104 Mn Trains	TRIM and Manganese clients	To achieve 12 Mtpa via Coega and Gqeberha ports	Securitisation funding or PSP/concession to a party
11	Brownfields/Greenfields	Sishen Saldanha	Loop 4 traffic deviation	TRIM	Regain an Iron Ore Slot from GFB	Securitisation linked to Iron Ore PSP
12	Brownfields	Pienaarsrivier to Beitbridge	Increase capacity to 17 trains per day	TRIM and Cross Border Operators	To increase trains per day to SADC countries	Concessional Funding and Debt
13	Greenfields	Logistics Park in Durban Old Airport and/or Cato Ridge	Allow TEUs to undergo modal shift, be destuffed or stored in Durban	Terminal Operators	Improve efficiency at the port and allow shuttles between port and logistics park. Reduce train turnaround time.	PSP based on project funding
14	Greenfields	Logistics Park in JHB South	Allow TEUs to be destuffed or stored in Park	Terminal Operators	Create freight village in Johannesburg South Area	PSP based on project funding
15	Greenfields	Ermelo to RB	Traction power upgrades Twin Overvaal Tunnel Grade separation at switching points.	TRIM and Coal clients	Traction power, Overvaal Tunnel twin & grade separation at switching points.	Securitisation linked to Coal Corridor PSP
16	Greenfields	Lephalale to Ermelo	26 tal extension beyond Ogies and feeders. Ogies to Lephalale.	TRIM and Coal Clients	To increase capacity on coal line for newer mines in Northern Mpumalanga	Securitisation linked to Coal Corridor PSP
17	Brownfields	Double Veertienstrome line	200km line doubling	TRIM	Increase volume online, demand exceeds capacity.	Corporate Funding by SOE
18	Brownfields	De Aar to Worcester	Loop additions	TRIM	Prepare Cape Town to Gauteng corridor for traffic	Mixture of Corporate Funding, Concessional Debt and Government Debt Underpin
19	Brownfields	Bloemfontein to PE	More Automotives to PE	TRIM and Motor	Allow Gqeberha to support	Concessional Funding and Debt,

ID	Project Type	Segment	Project	Primary Parties	Reason	Potential Funding Method
				Vehicle exporters	Durban as an Automotive hub port.	Securitisation underpinned by Auto exporters
20	Greenfields	Gauteng to Durban, Cape Town to Gauteng, Gauteng burg to Musina (via Polokwane), Noupoort to Gqeberha	High Speed Rail line with mixed freight standard-gauge	Government	To capture high value and refrigerated cargo. Set up network for the future with a focus on containerised goods.	Government Underwriting of Debt & Concessional Funding
21	Mixed	Metrorail Upgrades - CT, JHB, DBN	Reconfiguration and Upgrades	PRASA-IM	Bring PRASA network back to design capacity	Government Funding and Debt
22	Continuous Improvement	Network continuous improvement	Reconfiguration and Upgrades	TRIM and PRASA-IM	Network improvements for improve maintenance, operations and safety.	Government Funding and Debt

The projects were tested under scenarios taking into factors such as market demand, technical need for the project and adjustments for the funding method to be used, which developed a pessimistic and an optimistic view of the extent of the funding needed. The extent of the difference between the optimistic view is that it needs 27% less funding than the pessimistic view of adjustments made for poor markets, cost overruns and different types of funding arrangements, over the full list of projects identified. As there are a number of individual projects encapsulated in Table 14-3, it can be noted that the funding needs between optimistic and pessimistic scenarios, will vary between projects.

A comparison has been made to the current capital programme of TRIM to understand how this matches to the projected overall funding needs in the NRMP and it though it currently is lower than the annual expectations and in places may also be misaligned in that it focusses on funding capital to sections of the network that private sector is most willing to help fund as per Table 14-1, such as the Ore Corridor and the Northern Coal Corridor. The NRMP recommends that future iterations of annual capital application of public sector funds be more closely aligned to that stated in Table 14-1 and that private sector funding be crowded into areas such as bulk lines and mineral exports.

Scenarios were also run of the capital programmes to assess the financial stability and adaptability of the NRMP. By incorporating assumptions about inflation, potential cost overruns, technology delays, and fluctuations in funding, the impact of these factors on the overall financial plan over the next 5, 10 and years beyond were evaluated, under three scenarios:

- Likely Scenario: Reflects a projected increase at every five-year interval, representing a balanced estimate based on expected cost escalations and funding trends.
- Low Scenario: Assumes a less than 25% decrease in cost estimates, accounting for potential efficiencies, lower-than-expected inflation, or conservative project execution.
- High Scenario: Assumes a greater than 25% increase in costs, factoring in risks such as extended delays, higher-than-anticipated inflation, and more significant funding shortfalls.

Generally, the results indicated that all capital programme scenarios would bring about improved economic development to the South African economy. When comparing this to the option of not doing anything to the network and retaining its current capabilities, all 3 scenarios exhibited and improved economic impact. This was especially relevant in the 2040 and 2050 decades. This is in line with long term nature of rail infrastructure investment and its ability to pass on benefits to future generations.

The graph below shows results as follows and the outcomes of the NRMP capital plans, whereby the comparisons to present worth are especially marked in the next three decades. As the impact of these programmes reduce in the next 20 -30 years, the NRMP will need to be substantially reviewed in line with the demand scenarios at that time and technology development happens in the logistics sector.

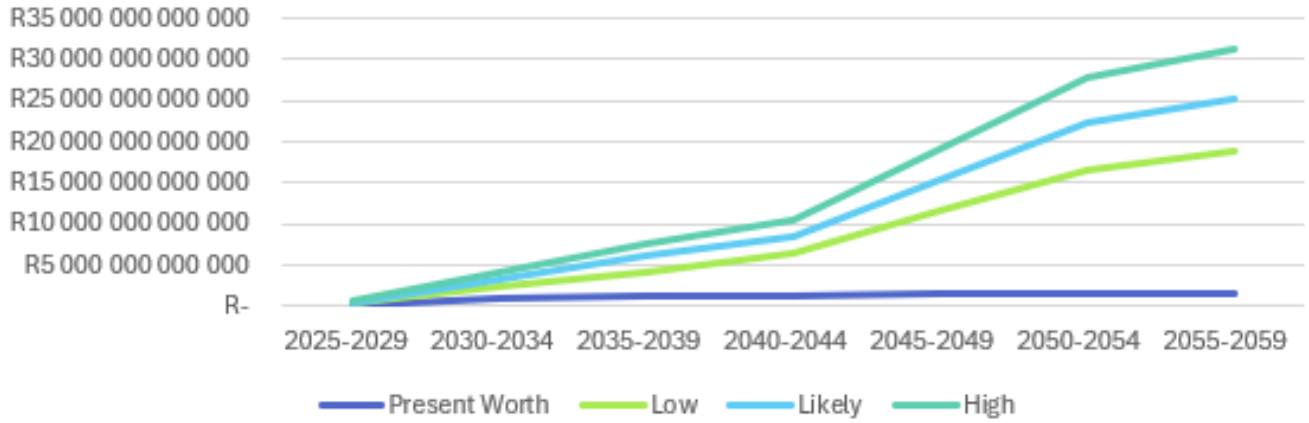


Figure 14-2: Comparison of Scenarios to present worth

Finally, an Economic Impact Assessment (EIA) was done focusing on NRMP and associated infrastructure in South Africa, the main objective being to identify the potential impacts of the NRMP on South Africa as well as the surrounding economies. The EIA determined the potential socio-economic implications of the NRMP to compare its possible effects with a “no go” alternative. The "no go" alternative assumed that the NRMP and its supporting infrastructure will not be built. This implies that the "no go" alternative represents the current state of the logistics environment, including the current socio-economic condition of South Africa.

CBAs were done for low, medium, and high demand projects and thereafter an impact assessment matrix was developed.

14.7 Conclusion

As stated the funding strategies should integrate into the developments per corridor on the network, so as to better align funding with the needs of the market as provided in Chapter 7, as per Table 14-3 below. Those blocks in red are where there is a danger, that if no action is taken to upgrade capacity and fund it, then demand will outstrip the current nameplate capacity.

Table 14-3: Timing of Network Funding Actions

Key Corridors	Year of Funding Timing and Activity				Comments
	2018	2028	2038	2048	
Coal Corridor					Good balance of demand and capacity, renew line
Waterberg Coal					Need to upgrade by 2028
Ore Corridor					Good balance of demand and capacity, renew line
Manganese to PE					Need to upgrade by 2028
Phalaborwa exports					Immediate action for connection to Hoedspruit
Gauteng-De Aar					Renew line and expand capacity as volumes return
De Aar - CT					Develop the demand and upgrade line later
Gauteng – Durban					Renew the line and monitor to match with increased demand
Musina Line					Renew the lines only in association with other SADC networks
Border Lines					Renew the lines only in association with other SADC networks

Note: Green = No need to upgrade capacity for demand. Orange = Planning and upgrade to begin to meet demand. Red = Danger capacity no longer meets demand.

The following drivers of funding needs were identified in line with Section 7.8 of this document:

1. The line with an immediate need for funding is the magnetite corridor from Phalaborwa, though the only section that is really under strain is the link between Phalaborwa and Hoedspruit. Funding will be driven by the primarily single commodity demand nature of this section of the corridor and only having 3 large clients on the section, this feeder line into the Northeast Corridor is well suited for a PSP arrangement due to its long-term volume availability and growth, a securitisation methodology will work very well amid the key magnetite, rock phosphate and vermiculite customers.

2. The second line needing attention is the Waterberg line, driven by Exxaro and possibly Botswana Coal. Again, here as this section (plus later the chrome traffic from Rustenburg) is also well positioned to be upgraded by means of PSP funding, in the same way as is being done for magnetite above. Again, this should be client supported to ensure the long-term success of the line.

3. The key current coal bulk ore line (41% of volume) seems to not have a mismatch in the long term of demand vs. capacity and as expected for coal (with slowing global demand due to carbon emissions) the volumes will seemingly not grow in the long term. From a national point of view funding risk can be best managed by the coal clients and as they can play a stronger role in the full supply chain (they already own mines, loading sites and port terminal), they could well play a more active role in the rail network via some sort of support for a PSP of the network and even its operations. The short-term need is to ensure the corridor regains its nameplate capacity and within that need the interests of the coal exporters, other mineral exporters and the state converge as the objective is to return to 100 Mtpa+ capability, which will drive funding arrangements into the PSP sphere as private sector will have the motivation and risk appetite to invest.

4. In terms of the iron ore corridor (35% of volumes), it seems a similar philosophy as the coal corridor can be followed, though two key commodities, iron ore and manganese mining may have to participate as both have an interest in short and long-term to ensure the rail corridor operates effectively.

5. In terms of the manganese corridor to the Eastern Cape, the red lights are appearing in the next few years and thus a case needs to be made for upgrading the rail capacity to meet future needs. It is important here that this be done in association with the development of port handling capacity in the port of Nqgura. In this case the major manganese client base is available to participate and risk capital in a co-operative manner, as they are the parties that can guarantee volumes from their mines and sell the commodity into world markets. Thus, the application of a PSP arrangement would be of value going forward.

6. Finally, this leaves those corridors that serve a multitude of clients and constitute the “Golden Triangle” of manufactured and FMCG cargo flow in South Africa. Both the Durban –Gauteng and Cape Town – Gauteng corridors have the nameplate capacity to move the volumes in the next decade or so, but their client base is more diverse and need to be attracted from the road mode. For this reason, the short-term strategy to achieve an effectively operating line that may need to be funded using public sector and institutional funding, with the risk remaining with the network owner for recouping the investment. This will call for a greater mix of state funding, subsidies, and DFI sector funding to be used as funding methodologies. Here the IM will focus its investment and concentrate available BFI funding , especially initially to begin to attract volumes from road and develop a revenue stream that can be used to fund further investments, with private sector involvement in the medium term especially during the development of a Phase 1 of a 1 435mm standard-gauge high-performance national rail network. The standard-gauge will be designed to enable rail to address two latent opportunities in the national transport task that narrow-gauge railways cannot address properly. The development of the N3 under SANRAL with the utilisation of toll concession companies over different sections of the road will serve as a good model.

7. The last area is the linking of the South African network to its neighbouring networks. Generally, here it seems the supply can cater for demand over the long term, but the key here is for funding to be multilateral as it needs to be linked to the other SADC rail developments to ensure that capacity and operational performance occurs over the different countries’ rail networks and is not causing congestion at border handovers. Here too the IM, within the framework of the Africa Integrated High-Speed Rail Network, will play a more active role with the aid of multi-lateral and institutional funders.

In commodity groupings where there is stable off take and large clients who have previously contracted with Transnet, there is a greater flexibility for the IM to participate in PSP opportunities. This would especially cover commodities such as iron ore exports (Ore Corridor), coal exports (North Corridor) and manganese, magnetite and chrome exports on sections of the GFB network.

On the other hand, the more diverse parts of the network such as the Golden Triangle, border flows and the Central corridor around Gauteng, where offtake is splintered and diverse lends in the short term to continued greater involvement of public sector funding. Private sector funding will be crowded in by attracting private sector operators to take up capacity, returning rail traffic from road competitors and while rehabilitating the poorly maintained sections, recapturing market share. When this is achieved over the next few years, then the opportunity will develop, to attract more private sector funding in the infrastructure and in further capacity upgrades.

15 Operating Capital Statement

15.1 Purpose of the chapter

The purpose of the chapter is to develop operating cost, rail operating funding, and rail institutional funding statements based on historical analyses, cost analyses and international case studies. The chapter also provides a proposed revenue methodology for Infrastructure Managers. This chapter is developed in conjunction with Chapters 3, 10 and 14.

15.2 Introduction

The NRMP is positioned within a long-standing evolution of rail policy in South Africa, reflecting a transition from a historically state-dominated, vertically integrated system toward a modern, market-oriented and functionally separated rail sector. For over a century, rail infrastructure and operations in South Africa were managed as a single, vertically integrated public entity, with investment, maintenance, and service delivery centrally controlled and funded. This model enabled the expansion of a national rail network but also embedded structural inefficiencies and limited flexibility in responding to changing economic and logistics demands. The introduction of Open Access, as articulated in the TRIM Network Statement, establishes a clear distinction between:

- The provision, funding, and maintenance of rail infrastructure.
- The operation of freight and passenger services by TOCs, including their associated CAPEX and operating expenditure (OPEX).

This reform marks a fundamental restructuring of the rail sector, with Transnet currently assuming a dual role in the transition, managing its own rail operations, while enabling the emergence of a distinct infrastructure management function. The NRMP recommends that this infrastructure function shall evolve into an independent entity under the DoT South Africa, reinforcing the principle of fairness, transparency and non-discriminatory access to the rail network, for Transnet Operating and other TOCs.

From a policy perspective, this structural reform creates opportunities for increased and efficient private sector participation, particularly in operations and certain infrastructure asset provision, while also introducing new regulatory, financial, and institutional challenges. International experience demonstrates that such transitions require careful management of risk allocation, performance incentives, and long-term funding frameworks to avoid unintended consequences.

The implications for operating capital are significant. Under the new reformed structure, Train Operating Companies (TOC) may adopt diverse asset ownership models, including direct ownership or leasing arrangements through rolling stock leasing companies (ROSCOs). Each model necessitates tailored financing strategies aligned with risk exposure, cost structures, and revenue certainty.

Rail remains a capital-intensive sector and thus has high fixed costs, with distinct policy approaches required for freight and passenger services. Freight rail operations are generally expected to recover their operating costs through user charges, reflecting a commercial orientation. In contrast, passenger rail services, particularly commuter services, are seldom financially self-sustaining and will require ongoing public subsidy to ensure affordability and accessibility. This divergence underpins the NRMP's differentiated approach to operating and capital costs across market segments. This calls for a need to provide the most efficient rail solution to customers, so that rail is well positioned to compete with other surface transport modes. Concurrently, significant public investment in road infrastructure, particularly through entities such as the SANRAL, will be seen as creating an uneven competitive landscape. The Network Statement should address some of these imbalances as it evolves from the current situation where rail operators and their customers typically bear the full cost of rail infrastructure and operations and road users contribute only partially to the total lifecycle cost of road infrastructure through fuel levies, licensing fees, and tolls, to one where the infrastructure is shared more evenly.

In the interim it is important that for rail to address the cycle of declining rail volumes, reduced revenues, and deferred maintenance, there needs to be greater efficiency and more cost-effective services provided by the

network owners and operating companies providing rail. Taking into account that a substantial proportion of OPEX is currently absorbed by personnel and energy costs, limiting the capacity for reinvestment in maintenance and asset renewal, there needs to be a coordinated policy response that addresses both investment and specifically operating funding constraints.

Within this context, the NRMP will provide a structured framework to prioritise revenue and cost flows and guide the allocation of scarce financial resources. Not all rail interventions are financially viable, particularly in the passenger sector, where many projects can only be justified on the basis of broader economic and social benefits. Such interventions necessitate explicit policy decisions regarding subsidies, grants, and cross-subsidisation mechanisms to support their implementation.

From an operating capital perspective, the international experience indicates that the majority of rail operating costs are activity-based, including personnel, energy (fuel and electricity), maintenance, and financing costs. A smaller proportion should comprise indirect costs, the allocation of which remains a key policy and management challenge. In summary, the NRMP situates operating capital policy within a broader historical and structural transformation of the rail sector. It recognises the need for:

- A clear and transparent separation of infrastructure and operations.
- Differentiated funding models for freight and passenger services.
- Targeted public subsidy for socially necessary services.
- An efficient and competitive rail operation, which does not unfairly burden rail operators with policy decisions and costs that do not apply to the road sector.

This policy foundation informs the approach to operating revenue, costs, capital, ensuring alignment between financial sustainability, service delivery objectives, and long-term sector reform.

15.3 Infrastructure Operating Revenue Statement

The financial sustainability of the rail network hinges on effectively managing revenue and operating costs. The revenue structure for rail operations comprises three key components:

- traffic (volume of goods/passengers).
- pricing (tariffs).
- revenue collection.

While freight services are expected to generate sufficient revenue to cover their costs and provide a margin for investment, passenger services globally, and notably in South Africa, typically cannot cover even direct operating costs and require government subsidies or incentives.

Pricing and tariff setting are fundamental to financial viability. Tariffs are governed by costs, competition, and regulation. In South Africa, the imbalance caused by road infrastructure being largely state funded, while rail has been self-funded creates a challenge, as road hauliers often act as price setters in competitive markets, leaving rail as a price follower. The NRMP recommends that tariff regulation should focus on rail access rates charged by the IM rather than operating fees, which will remain market competitive due to competition between rail operators and road transporters.

As per the long-term regulatory framework for rail access, tariffs shall be determined by the Transport Economic Regulator (TER), with the explicit objective of ensuring that tariffs are fair, transparent, and equitable, while promoting financial sustainability, business continuity, and broader economic growth. In this context, a uniform average access tariff shall not be adopted, as such an approach would introduce inappropriate cross-subsidisation and undermine market efficiency. Instead, the tariff-setting framework shall be grounded in three core principles, namely, the cost-of-service provision, the value and global competitiveness of the commodities transported, and the need to maintain intermodal competitiveness, particularly with road transport.

To ensure both financial viability and regulatory discipline, the tariff framework shall incorporate a clearly defined tariff floor and tariff ceiling. The tariff floor shall represent the minimum permissible tariff for each market segment and shall be based on the direct operating costs incurred by the IM in providing access to the rail network. These costs shall be limited to those that are cost efficient, prudent, and directly attributable to service provision, including personnel, security, materials, fuel, and other relevant operational expenditures. Where feasible, such costs shall be allocated to specific tariff segments, with shared costs apportioned on the basis of GTKs. Traction

electricity costs shall be treated as a pass-through item and excluded from the tariff floor calculation. The tariff floor shall therefore constitute a proxy for marginal cost, below which the IM would be unable to sustain operations without incurring losses.

The tariff ceiling shall serve as a regulatory safeguard against excessive pricing by the IM and shall be determined using an asset-based methodology, such as the Depreciated Optimised Replacement Cost (DORC) applied to the Regulatory Asset Base (RAB), in conjunction with an appropriate Weighted Average Cost of Capital (WACC). The RAB shall be disaggregated by tariff category to ensure cost reflectivity across network segments. Only efficient and prudent operating expenditures shall be included in the calculation, with shared costs allocated on a mixture of GTK and Train kilometre basis with traction electricity excluded. The tariff ceiling shall further incorporate depreciation and a provision for taxation, thereby ensuring that tariffs remain within reasonable bounds while enabling the IM to recover costs and earn a fair return on investment.

Within the bounds established by the tariff floor and ceiling, differentiated tariffs shall be determined for distinct market segments based primarily on demand-side considerations, including customers' ability to pay. This approach shall balance the principle of cost reflectivity with the strategic imperative of maintaining competitiveness relative to road transport. Where necessary, limited cross-subsidisation and/or targeted fiscal support may be applied to facilitate a modal shift from road to rail and to support broader policy objectives. Tariff differentiation shall consider factors such as commodity characteristics, train configuration, route and distance, and load factors. All tariff proposals shall be subject to a comprehensive assessment of their financial implications for the IM, as well as their impact on TOCs and end users, including potential effects on pricing, demand, and network volumes.

Revenue generated from rail operations shall be sufficient, where applicable, to recover operating costs and contribute toward debt servicing, asset renewal, and network expansion. Freight rail operations shall be expected to recover their full operating costs, access charges and related costs, by the tariff it charges, to earn its revenues. In contrast, passenger rail services, including those operated by PRASA, which provide socio-economic benefits but are not commercially viable, shall be supported through targeted government subsidies or other financial mechanisms. Such support shall be conditional on demonstrated operational efficiency, financial transparency, and accountability to ensure that public funds are not used to subsidise inefficiencies.

A standardised and transparent cost allocation framework shall be implemented to support tariff determination and regulatory oversight. This framework shall require the disaggregation of OPEX components, including maintenance-related personnel, materials, contractor costs, and ancillary expenditures, to ensure accurate attribution to operational activities. The accurate reporting and allocation of OPEX shall directly inform tariff floor calculations and broader revenue models. Compliance with these principles shall be mandatory to support financial sustainability, improve operational efficiency, and enable effective regulatory governance of the rail sector. This is discussed further in Section 15.4.

15.4 Infrastructure Operating Costs (OPEX) Statement

The main operating elements for rail infrastructure relate to providing and managing trains on the network, along with the maintenance and safekeeping of the perway (track) and supporting facilities. Other infrastructure facilities requiring maintenance include operating control centres, train management systems (encompassing signalling, communications, and wayside monitoring), and electrical overhead equipment, where applicable. Remaining operating costs are linked to the infrastructure manager's workforce services. Typical infrastructure operating cost elements include labour (salaries and wages), fuel and energy costs, rental and security costs, and sales and marketing costs.

Perway maintenance has two main components, namely a fixed annual component, which is shared among all supply chains on a track section and a variable component that depends on the gross tonnage carried by the infrastructure. In the freight sector cost is determined per supply chain based on its annual gross tonnage and the percentage of time its service occupies the track. For passenger trains, the variable cost is typically measured in train-kilometres as gross mass and axle load are less relevant than for cargo. Daily operational maintenance is usually performed in-house, while heavy maintenance, which is based on long-term programmes, is often contracted out.

Financially, revenue from operations should ideally cover operating costs and provide a margin for debt servicing, network upgrades, and expansion. Freight service operators would pay access fees designed to enable the infrastructure owner to sustain the service over the long-term. Passenger services typically cannot cover operating costs and require government financial relief in the form of subsidies or incentives. Transparency from operators is needed to ensure taxpayer subsidies do not cover inefficiencies.

In the South African context, there has been a trend to treat annual perway maintenance OPEX as a capital item, termed COPEX (Capitalised OPEX). This practice detracts from accurately identifying the actual annual repair and maintenance costs for railway lines because it is perceived as a capital item to be recovered in the future, rather than from current revenues. The practice of capitalising routine maintenance expenditure (COPEX) shall not be permitted as a standard approach to financial reporting. All routine and annual maintenance costs shall be recognised and reported as operational expenditure in the period in which they are incurred. The COPEX allocation practice also impacts the calculation of the tariff floor in revenue models. Annual maintenance costs should be viewed and reported as operational expenses, the IM shall ensure that all cost components, including personnel, materials, contracted services, and overheads, are correctly classified and allocated, with no duplication or misrepresentation of costs.

A key distinction emerges between freight and passenger rail in terms of financial performance and funding mechanisms. Freight rail operations are generally expected to recover their operating, maintenance, and capital costs through market-based revenues, making them highly sensitive to pricing, efficiency, demand elasticity and competition with road transport. In contrast, passenger rail services are structurally dependent on government subsidies, as fare revenues are typically insufficient to cover even direct operating costs. This divergence has important implications for funding models, tariff structures, and policy interventions, particularly in ensuring that socially necessary passenger services remain viable while market efficient freight rail improves its competitiveness and market share.

Compounding these challenges is the imbalance created by a sustained shift of both freight and passengers from rail to road, creating a cycle of declining volumes, reduced revenues, and deferred maintenance. The NRMP desires that this trend is reversed by requiring coordinated investment, improved cost efficiency, and regulatory frameworks that support fair competition between modes. Ultimately, strengthening both freight and passenger rail systems is essential not only for financial sustainability but also for achieving broader economic, environmental, and transport policy objectives in South Africa.

Rail infrastructure operating expenditure (OPEX) shall be structured and managed to ensure transparency, cost reflectivity, and long-term network sustainability. Perway maintenance shall be recognised as a core operational activity and shall comprise both fixed and variable cost components. The fixed component shall be allocated across all commodities and services utilising a given section of track, while the variable component shall be apportioned based on usage, including a combination of gross ton kilometres and train kilometers for freight services and train kilometres for passenger services. This approach shall ensure equitable cost allocation across all users of the rail network.

The IM shall be responsible for the provision, management, maintenance, and safeguarding of rail infrastructure and associated systems in a cost effective and transparent manner. Maintenance activities shall include routine operational maintenance undertaken in-house, as well as periodic heavy maintenance executed in accordance with approved long-term maintenance programmes, which may include contracted services. Infrastructure components subject to maintenance shall include, but not be limited to, track (perway), signalling and train control systems, communication systems, electrical overhead equipment, and operational control centres. All associated operating costs, including labour, energy, security, and support services, shall be clearly defined, efficiently managed, and transparently reported.

The NRMP would as a key directive ensure that the IMs report on their cost elements in a detailed manner to the TER, who would be able to analyse for reasonableness, benchmark against international peers and ensure that the IMs are focusing their expenditure in those areas that have the greatest impact on the service they offer to the rail users and end clients. As there is no market mechanism to ensure this, the TER should undertake this role as soon as is possible.

15.5 Rolling Stock Operating Expenditure

Rolling stock OPEX shall be managed in a manner that ensures cost efficiency, transparency, and long-term operational sustainability across the rail value chain. The principal cost components associated with rail operations shall include energy, direct labour, maintenance of rolling stock and infrastructure, network access fees, insurance, and where applicable, first- and last-mile road haulage. These cost elements should be comprehensively incorporated into rail financial models to ensure accurate cost attribution and effective pricing of services, especially in areas that are managed or funded by the public sector.

Energy costs shall be determined on a per-train basis for both diesel and electric traction and shall reflect the full cost of operations, including return journeys where applicable. In the South African context, where electric traction is largely supplied by Eskom, energy pricing structures shall be aligned to promote efficiency, affordability, and sustainability. Tariff structures that disproportionately allocate fixed costs to low-volume lines shall be reviewed and reformed to prevent distortions in energy pricing that may incentivise a shift from electric to diesel traction. Energy pricing policies shall support national objectives related to carbon reduction and the long-term viability of electrified rail networks. Accordingly, the IM, rail operators, and Eskom shall engage in coordinated processes to establish equitable and sustainable energy tariff mechanisms that reflect both system usage and long-term infrastructure requirements.

Direct labour costs shall be managed and allocated in a manner that reflects actual operational activities, including train operations, maintenance, and support services. Labour associated with rolling stock maintenance and overhaul shall be directly attributed to the relevant assets to enable accurate life cycle costing and performance assessment. Workforce planning and cost management shall be aligned with operational efficiency objectives and industry labour productivity benchmarks.

Rolling stock maintenance shall be undertaken in accordance with life-cycle cost principles and shall include routine maintenance, scheduled overhauls, and condition-based interventions. Maintenance costs for locomotives, wagons, and containers shall be determined based on fleet size, utilisation levels (including gross and net ton kilometres), and established industry standards. Time-based and condition-based maintenance practices shall be applied to ensure safety, reliability, and optimal asset performance. The full life-cycle cost of rolling stock, including acquisition, maintenance, and major overhauls, shall be recognised in financial planning and tariff setting to ensure sustainability of operations.

Road haulage costs associated with first mile and last-mile connectivity shall be incorporated into supply chain cost structures where applicable. These costs shall be determined on a per-tonne basis and shall reflect the specific characteristics of the route and service requirements. Where road haulage constitutes a significant portion of the transport chain, integrated pricing models shall be applied to ensure competitiveness and efficiency across the multimodal network.

The NRMP directs that all regulated service OPEX components (especially among the various IMs) shall be subject to transparent reporting, standardised cost allocation, and regulatory oversight to ensure alignment with national

rail policy objectives. This includes promoting primarily operational efficiency, supporting a shift from road to rail, enhancing competitiveness, and ensuring the long-term financial sustainability of the rail sector.

15.6 Rail Institutional Funding Statement

A coherent institutional and funding framework shall be established to support the sustainable development, financing, and operation of the rail sector. Institutional arrangements shall be aligned with funding strategies to ensure that governance structures promote investor confidence, reduce the cost of capital, and enable efficient delivery of infrastructure projects. In this regard, governance principles, including accountability, regulatory quality, rule of law, political stability, and control of corruption, shall be embedded within all rail institutions and regulatory bodies. These principles shall underpin the ability of rail operators and infrastructure managers to access both domestic and international financing.

The NRMP also recognises that there is a need to allow competition among the different TOCs. A significant barrier to investment rests with an operator having long term allocation of access on specific routes and slots and being able to crowd out competing TOCs, to the detriment of the customer who is not able to look at alternative operators, especially on congested routes, as there are minimal extra slots available. This could create a situation where the dominant TOC, is able to continue operating inefficiently and the customer's only recourse is to use an alternative mode of transport.

Government shall ensure that an enabling institutional environment is in place, comprising clear policies, legislation, regulatory frameworks, and adequately resourced institutions. These elements shall collectively support the mobilisation of funding, ensure compliance with financing conditions, and facilitate long-term infrastructure investment. Institutional mandates shall explicitly include responsibilities for financial planning, project preparation, and the coordination of funding strategies across the rail sector.

Project prioritisation and preparation shall be undertaken as a continuous and structured process to ensure that rail investments are aligned with national strategic objectives and remain responsive to changing economic and market conditions. All major infrastructure interventions shall be supported by rigorous feasibility assessments, including technical, financial, and economic evaluations over the project life cycle. Institutional arrangements shall promote coordination across jurisdictions and stakeholders to ensure that infrastructure projects are effectively planned, funded, and implemented.

The mobilisation of PSP shall be actively supported through the development of institutional capacity and appropriate governance mechanisms. A centralised institutional function, such as a Private Sector Participation (PSP) Unit, shall be established or strengthened to provide dedicated capacity for project preparation, transaction advisory services, and engagement with investors. This function shall leverage funding and technical support from multilateral and regional development finance institutions (DFIs) and shall facilitate the structuring and procurement of bankable rail projects.

Regulatory and policy instruments shall be considered, where appropriate, to support modal shift objectives and enhance the competitiveness of rail. Such instruments may include targeted interventions to increase rail volumes, provided that they are supported by adequate enforcement mechanisms and operational capacity. The implementation of open access frameworks, supported by transparent and regulated access tariffs under the oversight of the Transport Economic Regulator, shall be prioritised to improve market access, encourage competition, and increase network utilisation. As the utilisation of the network is a function of demand by the logistics market, it is important that a key driver for the allocation of capacity is the long-term volume need of key customers on a route. The NRMP believes that the transport customer is best able to define this need for capacity and thus the objective for capacity allocation, is that the customer should be the key driver of access allocation in a manner that provides competitive efficiency and creates a rail service that is not only cost effective but provides the optimum service levels.

A formal institutional framework within the parameters of the Network Statement, shall be established for rail corridors and networks, comprising independently mandated entities responsible for coordination, performance monitoring, stakeholder engagement, and infrastructure advocacy. These institutions shall be empowered to identify funding sources, support project development, and promote efficient and competitive transport services matching the demand needs of the customers. Institutional structures shall be designed to reflect the complexity, scale, and maturity of the rail network and shall incorporate both governance and commercial considerations. To

ensure that the rail sector becomes cost competitive, there is a need for allocation of capacity be done in a transparent manner and that immediate efforts be done to match client demand and choice with the allocation of capacity to the correct party. It is not expected that the current clients of Transnet will hoard more capacity than they need, if a network statement ensures there are penalties for not using allocated capacity. As defined by the logistics concept of "wide distribution" rail capacity, should be made available across numerous stakeholders and channels, giving the end consumer the freedom of choice and capability, to optimise its usage of rail networks and operators.

In Chapter 16: Capital Investment and Subsidy Statement the sustainable funding mechanisms are described that shall be secured for institutional structures and their core functions. Reliance on short-term or ad hoc funding sources shall be reduced through the establishment of stable and predictable funding arrangements, including government budget allocations and, where appropriate, contributions from industry stakeholders, based on mechanisms such as licensing of rolling stock or registration fees based on volumes moved. Institutional funding shall be sufficient to support technical capacity, project preparation, and effective oversight functions.

Capacity development shall be prioritised to address skills shortages in areas such as project preparation, financial structuring, and infrastructure delivery. Where necessary, specialist expertise may be procured to support complex projects; however, long-term strategies shall focus on building internal institutional capacity. Institutional arrangements shall be streamlined to reduce bureaucratic inefficiencies, improve decision-making speed, and enhance accountability.

Governance structures shall be designed to ensure market effectiveness, continuity in decision-making, responsiveness to market conditions, and effective implementation of strategic initiatives. Institutional reforms shall aim to reduce fragmentation, improve coordination, and enable customers and rail entities to respond competitively to changes in supply chains and competing transport modes. The establishment or designation of a central coordinating entity, such as TER and a PSP Unit or similar structure, shall be prioritised to drive the implementation of rail operational cost-effectiveness and facilitate engagement with the market, IMs and TOCs to achieve a low cost rail system, that is able to be self-sustaining and is benchmarked in terms of costs against other competing international rail networks.

16 Capital Investment and Subsidy Statement

16.1 Purpose of Chapter

The purpose of the chapter is to develop a capital and subsidy investment statement for the NRMP. The statement is developed through the lens of rail transition in the country that aims to lead to an Open Access model. The CAPEX funding statement includes track and related infrastructure, intermodal infrastructure and rolling stock issues and how these are influenced by the inclusion of CAPEX matters. The chapter also includes a summary of funding options. The subsidy statement includes a view on rail subsidies, government support for railways, grants, and a proposed targeted subsidy policy.

16.2 Introduction

The advent of Open Access marks a new era for South Africa's rail sector, separating infrastructure management from service provision. This policy shift presents opportunities for multiple TOCs to operate alongside state-owned entities such as TFR and PRASA, but it also requires clear governance, investment prioritisation, and sustainable financing.

Historically, vertically integrated structures allowed coordinated planning and execution of both CAPEX and OPEX projects. The NRMP now emphasises that independent IMs must collaborate closely with operators and TOCs, ensuring that infrastructure investments are aligned with operational realities and market demand. A network without demand, or rolling stock without cargo or passengers, undermines the effectiveness of capital programmes.

Financing remains a critical policy concern. Rail operators often face high debt levels, short-term borrowing, and limited access to affordable long-term financing. Policy interventions, such as sovereign guarantees, infrastructure bonds, equity/debt requirements, and involvement of international financial institutions, are essential to ensure capital programmes are financially sustainable.

Sustained under-investment has historically constrained the rail sector, leading to deferred maintenance, lost traffic, and declining revenues. The NRMP addresses this challenge by aligning investment with anticipated freight and passenger demand as per Chapter 7, restoring financial viability, and supporting the long-term development of a safe, reliable, and efficient national rail network.

16.3 Rail Funding Transition

Taking into account the preceding chapters as background and given the historical developments in rail infrastructure development, freight and passenger operations there has been a drive to adopt more investor friendly institutional processes over the last few years. This has caused changes to rail related strategy and policy development and means that there is a need for a transition in rail funding supply within the NRMP and is founded on the following:

- The railway sector in South Africa is transitioning towards an Open Access model involving various entities like IMs, TFR, PRASA, and new TOCs, who will need to co-ordinate to ensure a common objective of increasing the use of rail in the South African market. The common thread to this co-ordination will be the development of a market and investment friendly Network Statement by the IMs, including balanced capacity and operational access agreements.
- As rail is a capital-intensive business in many of its functions, the provision of funding to projects will need to be supplied in an environment where the network allows for certainty when planning the service design for the movement of cargo, for a customer. As the ability of a client to receive a competitive rate, is a function of the turnaround time of newly financed rolling stock on a network, the IMs need to provide a "fit for purpose" network to support the service design agreed with the rail customer, allowing lenders to be confident that the required return will be achieved.
- CAPEX is a crucial element for acquiring new equipment, rolling stock, track and bridge installations, technology, and long-term maintenance improvements, to support areas of demand and the NRMP sees railway CAPEX categorised into three main areas:

- Track and Related Infrastructure, focusing on safety, capacity, speed, and reliability, often targeting network bottlenecks.
- Intermodal Terminals, essential for shifting large freight volumes between rail, road, and sea, enabling door-to-door services, and presenting opportunities for PSP models.
- Rolling Stock, including locomotives, wagons, and containers, requiring significant capital, and often financed through leasing arrangements.
- Investments by the IMs in rail infrastructure projects are highly interdependent with associated supply chain interventions and operator investments by TOCs and the cargo owners. This will need to be properly managed and the granting of future capacity to new entrants, will need to be planned within a proper framework agreement. This will allow the different parties that need to fund the designed rail service (IM, concessionaires, cargo agent and TOCs) to be able to raise funding in a secure and regulated environment, with an agreement that protects everyone's interests equally and fairly.
- A key challenge is sustained under-investment, creating a vicious cycle of deferred maintenance, lost traffic, and declining revenues. Railways, not just in South Africa, but internationally as well, often face difficulty accessing long-term, affordable financing, leading to high debt levels that consume a large share of revenues intended for reinvestment.
- Analysis of TFR capital programmes over the recent past, shows a decrease in total capital spend while depreciation increased, indicating that cash flow meant for future investments is primarily being used for operational maintenance (COPEX), leading to reliance on loans for expansion and potential negative equity. As more than 75% of TFR's recent capital spend was actually asset maintenance, with very little spent on network improvement or expansion, the NRMP will direct the IM to identify projects underpinned by demand (Chapter 14) and commence planning to ring-fence funds for those particular needs. PRASA also has substantial network upgrade needs but has historically underutilised grants, although recent trends show increased capital spending, but it too needs to define capital projects and identify funding, based on meeting future demand. Both IMs shall endorse a commitment to provide safe and maintained networks for the customers with risk shared evenly between the IM and the operator, with a well-balanced Force Majeure clause protecting all parties. This will imply that in the Network Statement the IM assumes an equal share of risk with TOCs when providing of network access so as ensure bankability for investors in rolling stock.
- Subsidies serve different purposes for freight and passenger rail. For freight, subsidies aim to enhance environmental sustainability, reduce road congestion, and improve economic efficiency, rather than providing operational support. Urban passenger rail services invariably require subsidies due to low fare recovery. An analysis of the Controlling Entity's revenue from fares (which includes PRASA) is insufficient to cover even base salaries. When Metrorail is separated out, fare revenue covers a minimal percentage of staff costs, highlighting an unsustainable fare structure. This necessitates high operating subsidies, which increased from R1.7bn in 2020/21 to R2.1bn in 2023/24.

16.4 Capex Statement

When looking at the bankability of a project in its development phases, there is a need for rail capacity to move in alignment with the project development process. When funding is provided by the private sector or a bank, they would need certainty that at a time in the future, the IM will provide the needed network capacity for the project. To allow this to happen, the network statement developed by the IM must provide the capability of some form of long-term agreement, as opposed to access right now, to be concluded. This will allow for improved planning and protects all parties, namely network manager (who has to possibly upgrade the network), project manager (invest in rolling stock or terminal or mine) and banks (who are meeting financing needs).

The NRMP defines the strategic importance of state-directed funding to primarily support critical rail infrastructure upgrades and to underpin further private investment. Policy dictates that such funding should be allocated to an independent IM or designated State Agen\cy, rather than directly to train operators, in order to maintain market neutrality and minimise distortions. The NRMP in line with other rail policy states that progress should occur to split the IM structure from any state owned TOCs and they should share no common shareholding, so as to allow funders and stakeholders to perceive that the IM acts independently, fairly and transparently. This will allow for a situation where public sector investment is linked to policy objectives, such as increasing capacity, reducing access charges, improving network efficiency, and enabling sustainable service delivery by operators. This can be divided into the following groupings:

- Track and Related Infrastructure: Policy interventions in this domain will aim to enhance safety, interoperability, capacity, speed, frequency, and reliability across transport corridors. Infrastructure upgrades should be planned within the context of the national network by the IMs, prioritising bottlenecks

that constrain overall system capacity. There may be complementary investments to include improvements to workshops and depots to support infrastructure maintenance, refuelling, inspections, and ancillary rolling stock repairs.

- Rolling Stock Maintenance: It is expected that operators maintain their own workshops and this should align with the chosen procurement and financing models, e.g. asset ownership, wet lease, or dry lease arrangements.
- Intermodal Terminals: From a development standpoint, intermodal terminals are critical enablers of rail competitiveness, facilitating the aggregation, disaggregation, and modal transfer of freight consignments. Terminals support door-to-door services and strengthen rail as an alternative to long-haul road transport. Investment decisions for terminals must consider the logistics ecosystem, recognising the interconnected roles of multiple service providers. The NRMP proposes that the objective is to primarily support PSP in terminal development, including delivery models such as Build-Own-Operate (BOO) or Build-Own-Operate-Transfer (BOOT), particularly where financial returns align with market-based expectations.
- Rolling Stock: Rolling stock investments, including locomotives, wagons, and containers, are essential to achieving rail objectives for network capacity, reliability, and operational efficiency. Policy recognises the interdependence between rolling stock and infrastructure, but this will remain the domain of mainly private sector operator investments. Though this affects maintenance requirements, operational lifespan, and technology compatibility (e.g., electrification or terminal interface systems) in the network environment, it is expected that limited public sector and DFI investment will occur in this segment, except for development of some passenger services. The NRMP notes that capital interventions by operators for rolling stock may include short-term leasing, refurbishment, procurement of new units, and retirement of obsolete assets and will encourage leasing and structured financing as preferred solutions to address the high capital costs of rolling stock. Typically, this may involve limited recourse for private finance to be supported by government guarantees and mainly where it is necessary to secure long-term operational sustainability in the passenger segment.

There are many funding sources for the CAPEX solutions, and these are presented in the table below.

Table 16-1: Funding sources for the CAPEX solutions

Interventions	SOE funding ("pay-as-you-go")	Concessional and grant funding	Securitisation	Blended public-private funding	Private finance with government underpins.	Private finance
Rolling stock		✓		✓	✓	
Intermodal terminals					✓	✓
Infrastructure: vital and emergency repairs, maintenance, rehabilitation and renewal	✓	✓	✓ (long term)			
Infrastructure: increase slot capacity and axle load		✓	✓			
Infrastructure: telecommunication system and train authorisation			✓			
Workshops and depots	✓	✓				
Rolling stock maintenance (own, wet and soggy lease)		✓	✓			

The NRMP establishes that state support, through direct subsidies or loan guarantees, should be targeted toward segments of the rail sector where market risk is high and private investment is limited. There is a need to prioritise public sector interventions in areas where the client base is fragmented or dispersed, including container lines, domestic freight movements, automotive logistics and passenger transport, where private investors may be reluctant to commit capital without assurance of sufficient volumes.

In contrast, sectors characterised by a limited number of large clients, such as mineral ore exports, present conditions where private financing and industry-backed investment can play a greater role would not be prioritised for public sector funding. In these cases, rail investment and loans may be underwritten or supported

by private sector actors, reflecting a policy preference for leveraging private capital where market conditions permit. The NRMP's objective is to ensure that public funding is deployed strategically, minimising market distortions while supporting sustainable growth and operational efficiency across the national rail network.

16.5 Subsidy Statement

16.5.1 NRMP Approach to Rail Subsidies

The effectiveness of the rail transport subsidy framework is dependent on the following policy priorities:

- Sustainable funding mechanisms: Securing adequate and predictable funding to address historical backlogs and support the development of a modern, integrated transport system, particularly in areas where private sector investment is limited due to risk considerations.
- Integrated planning: Ensuring effective alignment between transport planning and land-use planning at municipal level to promote spatial efficiency and accessibility.
- Modal integration: Structuring commuter subsidies to support the consolidation and formalisation of the minibus-taxi industry, enabling its integration with rail as part of a unified public transport network.

Current Subsidy Context and Policy Implications

Government support to the rail sector has historically been weighted towards passenger services. The PRASA has received approximately R92 billion in subsidies over the past six reporting years to fulfil its mandate. In contrast, Transnet has received limited direct financial support, primarily for infrastructure recovery following the 2022 flood damage to the Durban–Gauteng corridor.

This funding profile indicates a policy bias toward passenger rail subsidisation. When considering combined revenues of PRASA and TFR (General Freight Business), totalling approximately R44.5 billion in 2023/24, with over R20 billion derived from subsidies (capital subsidies to PRASA and Transnet and operating subsidies to PRASA only), the effective subsidy level across the rail system is estimated at approximately 45%. This aligns with international benchmarks such as Italy, but exceeds those observed in Australia.

Further to the above and based on applicable policy documents in South Africa, the NRMP establishes a differentiated policy approach to the subsidisation of rail transport in South Africa, recognising the distinct functional and economic roles of freight and passenger rail. Subsidy interventions shall be targeted, transparent, and aligned with national objectives of economic efficiency, social equity, and environmental sustainability.

Freight rail and passenger rail shall be treated differently in the application of subsidies. Freight rail subsidies shall primarily support system-wide benefits, such as reduced road congestion, improved logistics efficiency, and environmental sustainability, rather than direct operating support. In contrast, passenger rail, particularly commuter services, shall continue to receive direct operational subsidies due to its critical socio-economic role and structural inability to achieve full cost recovery. The passenger subsidy framework shall be aligned with the National Public Transport Subsidy Policy (NPTSP) and shall aim to address historical spatial inequalities while improving affordability, accessibility, and service quality.

The development and implementation of a rail subsidy policy shall be guided by the following enabling conditions:

- Securing adequate and sustainable funding sources.
- Implementing necessary institutional and governance reforms.
- Ensuring effective coordination across all spheres of government.

Subsidy frameworks shall also address structural inefficiencies and vested interests within public institutions, ensuring that funding mechanisms and contractual arrangements are explicitly aligned with policy outcomes and performance objectives.

Objectives of the Rail Subsidy Policy

Rail subsidy policy under the NRMP shall pursue the following objectives:

- To correct spatial imbalances by supporting integrated transport planning that reduces travel distances and improves access to public transport.
- To invest in rail infrastructure and networks to ensure sufficient capacity, reliability, and service quality.
- To promote environmental sustainability by reducing the overall societal cost and impact of transport.

- To support low-income households by ensuring that essential transport expenditure remains affordable.
- To transform the public transport sector by promoting efficiency, accountability, and modal integration.
- To encourage innovation and improve service delivery through performance-based contracts and incentives.
- In line with international best practice, rail funding shall be embedded within broader sustainable transport strategies. These shall ensure that public and donor funding does not undermine the competitiveness of rail relative to road transport, while actively supporting the development of efficient and integrated transport systems.

Strategic Principles for Rail Subsidisation

Subsidy and funding interventions shall be guided by the following principles:

- Projects and funding mechanisms shall not weaken the competitive position of rail relative to road.
- Rail markets shall be actively developed through corridor-based planning and management of road–rail competition.
- Infrastructure investment strategies shall be coordinated across modes to avoid duplication and inefficiencies.
- Interoperability, intramodality, and integration with logistics systems shall be promoted.
- Collaboration between rail operators, logistics providers, and other stakeholders shall be strengthened.
- Capacity-building and skills development shall be supported at national and regional levels.

Freight Rail Subsidy Approach

Freight rail subsidy policy shall prioritise indirect and targeted interventions rather than direct operational support. The following policy directives shall apply:

- Freight Operating Subsidies: Direct subsidisation of freight operations shall generally not be permitted, as it may distort competition. However, targeted infrastructure support may be justified on strategic corridors, particularly those linking ports to inland markets.
- Method of Government Intervention: Public funding shall primarily take the form of once-off capital subsidies for infrastructure investment, directed to the IM or a State Agency, rather than train operators, to preserve a level playing field. This reinforces the need for institutional separation and independence of IM functions within entities such as TFR and commuter rail infrastructure managed under PRASA.
- Public Funding Purpose: All public funding shall be explicitly linked to measurable outcomes, including reduced access charges, improved efficiency, and increased network capacity and utilisation.
- Commercially Unviable Lines: Targeted subsidies may be applied to support rail lines that are not commercially viable but provide significant social or regional economic benefits. These interventions shall be driven by clearly defined public needs, particularly at local government level, and shall be subject to independent audit and performance monitoring.
- Private Sector Participation: The NRMP shall promote the mobilisation of private investment through open access frameworks and PSP initiatives. Mechanisms shall be established to allow access seekers to co-invest in infrastructure in return for cost-reflective access arrangements.
- Ring-fencing of Funds: Public and private investments in specific rail corridors shall be ring-fenced within the IM's financial structures. Revenue generated from such investments shall be allocated to cost recovery and debt servicing associated with those assets.
- Innovative Funding Mechanisms: Funding models, including securitisation, may be applied to recover infrastructure investment costs from increased capacity and improved operational performance, ensuring that beneficiaries contribute proportionally to funding obligations.

Passenger Rail Subsidy Approach

In contrast to freight rail, passenger rail subsidisation shall be direct, structured, and sustained, reflecting its role in supporting public mobility and economic participation. Subsidies shall:

- Support affordable and accessible commuter services, particularly for low-income households.
- Facilitate integrated urban transport systems, including coordination with buses and minibus taxis.
- Be linked to performance, service quality, and operational efficiency.
- Contribute to broader socio-economic objectives, including employment access and spatial transformation.

Summary remarks

The NRMP establishes a dual and complementary approach to rail subsidisation in South Africa:

- Freight rail shall be supported primarily through targeted infrastructure investment, regulatory reform, and private sector participation, with minimal reliance on direct operating subsidies.

- Passenger rail shall receive direct operational subsidies to fulfil its socio-economic mandate and support inclusive mobility.

This policy approach ensures that public resources are allocated efficiently, promotes a competitive and sustainable rail sector, and supports South Africa's broader economic, social, and environmental objectives.

16.5.2 Subsidy Statement

The NRMP subsidy statement is articulated in terms of a number of elements.

Policy Direction on State Support and Institutional Structure

- Targeted state support mechanisms: Government support (including grants, subsidies, and loan guarantees) should be applied selectively to address infrastructure investment gaps, particularly where concessionaires are unable to assume full infrastructure responsibilities.
- Separation of functions: The future of rail in South Africa is not purely vertically integrated or separated. freight rail in South Africa will be vertically separated (with open access), while metro rail will remain vertically integrated under public control.

Subsidy Policy Framework

The following policy positions are proposed:

- User-targeted subsidies: Subsidies will progressively shift toward direct, user-targeted support, prioritising low-income households (below the upper-bound poverty line). Transport expenditure for essential travel should not exceed 10% of household income, subject to capped monthly trips. Implementation will require investment in digital systems for means testing and subsidy administration.
- State ownership of strategic assets: The state will retain ownership of rail infrastructure and rolling stock within the subsidised network. These assets will be made available to operators through structured agreements, including PPPs, to reduce barriers to entry and promote competition.
- Competitive contracting of operations: While the state owns the assets, the operation of commuter passenger rail services will be competitively contracted to external entities. Operators will compete for the right to operate based on service contracts and approved transport plans, ensuring non-discriminatory access to infrastructure. As it is possible that no operator will be able to earn a required rate of return, the state would provide a subsidy, as is the case with the Gautrain. Government can also contract vertically integrated concessions as is the case with Gautrain.
- Cost recovery principles: Public transport services will generally operate on a cost-recovery basis, with subsidies bridging the gap between affordability and the cost-of-service provision. Fare levels and subsidy allocations will be differentiated across municipalities according to the local affordability levels and the state's financial capacity.
- Integration within municipal transport plans: Subsidies will be allocated based on approved, integrated transport plans developed at municipal level.
- Addressing inefficiencies: Subsidy allocation must be linked to performance outcomes, ensuring that funding is directed toward service delivery rather than supporting inefficient administrative or commercial structures.
- Rail as the backbone of the transport system: Rail will be prioritised as the core of the public transport network. Subsidy policy and infrastructure investment must support modal shift from road to rail, including improved first- and last-mile connectivity. Current investment patterns, such as significant expenditure by SANRAL on major road corridors (e.g., N3 and N2), should be more closely aligned with parallel investments in rail infrastructure to optimise system-wide efficiency and reduce congestion.

Freight Rail and Non-Subsidised Market Segments

While passenger rail requires ongoing subsidisation, freight rail policy emphasises commercial sustainability and private sector participation.

- Bulk corridors: High-density freight corridors (e.g., mining export lines such as Sishen–Saldanha and Ermelo–Richards Bay) should operate on a fully commercial basis, with private sector involvement in both infrastructure and operations where appropriate.
- Private sector financing models: Infrastructure investment may be undertaken through on-balance-sheet financing or project finance structures (SPVs), with support from DFIs where necessary.

- Infrastructure delivery mechanisms: Government may utilise turnkey and maintenance contracts to ensure quality construction and sustained asset performance, while retaining long-term ownership and responsibility.
- Access and concession frameworks: Infrastructure managers will allocate network access through slot allocation or franchising arrangements, recovering costs via user charges. Risk allocation will vary depending on the contractual model, with government typically retaining traffic and revenue risk.
- Availability-based concessions: As an alternative to direct subsidies, infrastructure provision may be structured through availability-based concessions, where private partners are remunerated based on infrastructure performance and availability, rather than traffic volumes. This model is particularly suitable for marginal or emerging corridors.

Summary remarks

The proposed policy statement establishes a structured transition toward a more targeted, efficient, and sustainable subsidy regime. It emphasises user-focused support, state ownership of strategic assets, competitive service provision, and strong alignment with municipal planning. At the same time, it recognises the differentiated role of freight rail, where market-based mechanisms and PSP should be prioritised over direct subsidisation.

16.6 Conclusion

In summary, the NRMP, aims to minimise direct operational subsidies, but acknowledges the necessity of targeted state funding for infrastructure upgrades, particularly on key corridors. It prioritises PSP and investment to enhance the network and reduce the burden on public finances, while ensuring a level playing field for new entrants through vertical separation and open access. In the case of commuter rail transport, the focus is on establishing people mobility, especially in a work environment and thus helping to grow the industrial base, while still ensuring that rail works closely with other modes such as minibus taxis and buses.

17 Special Projects

17.1 Purpose of the Chapter

This chapter defines what constitutes a Special Project within the NRMP, it sets out the principal freight and passenger programmes, summarises financial and environmental considerations, and then explains the prioritisation plan through which projects are identified, evaluated, sequenced and prepared for delivery.

17.2 Introduction

Across the major freight corridors identified in the NRMP, the same structural constraints continue to recur, including single-track sections, ageing yards, inefficient loading and terminal interfaces, constrained traction power, outdated and impaired signalling, and limited system interoperability. These weaknesses do not simply reduce operational efficiency; they undermine rail's ability to fulfil its intended role in the national logistics system. As a result, high-volume flows such as chrome, coal, manganese, and containers have increasingly shifted to road, driving up logistics costs, placing additional pressure on road infrastructure, weakening export competitiveness, and reinforcing the cycle of rail underutilisation and infrastructure decline.

It is within this context that this chapter focuses on Special Projects. In the NRMP, a Special Project can be defined by four key characteristics. First, it must address a nationally significant transport, economic, or social need. Second, it must have a corridor, network, or metropolitan impact that extends beyond a single local intervention. Third, it must be supported by a demonstrable strategic case grounded in demand, engineering, policy alignment, or future option value. Finally, it must require coordinated delivery across infrastructure, operations, institutions, or funding streams, meaning that it is better managed as a programme than as a stand-alone asset upgrade.

Accordingly, this chapter focuses on three sets of Special Projects. The first comprises large-scale, high-impact public infrastructure developments designated for fast-tracked delivery under the Infrastructure Development Act, 2014, and termed Strategic Integrated Projects under the Act. These are not isolated interventions, but multi-dimensional and multi-disciplinary projects in the national interest, intended to accelerate critical infrastructure development. The second comprises high-demand/high-engineering projects identified through the NRMP process, aimed at transforming the national rail network into a more inclusive, capable, efficient, and globally competitive backbone for economic development. The third addresses environmental feasibility and guidance, recognising that major rail interventions must also be considered in relation to environmental constraints, sustainability, and implementation readiness.

The chapter structure, as reflected in the figure below:

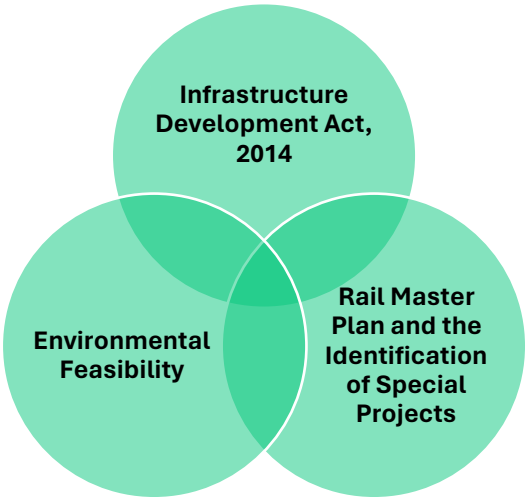


Figure 17-1: Special Projects within the NRMP

17.3 Infrastructure Development Act, 2014

The Infrastructure Development Act, 2014 provides the legal and institutional framework through which infrastructure of significant economic or social importance may be prioritised, coordinated and accelerated. For the rail sector, the importance of the Act lies in three main functions. First, it gives Government an established mechanism for recognising nationally important infrastructure through Strategic Integrated Projects. Second, it improves alignment across departments, public entities and approval processes where rail interventions must be implemented on a corridor basis. Third, it creates a pathway for accelerated delivery, land-related processes and private participation where projects are sufficiently mature and strategically justified.

For the NRMP, the Act is especially important because many of the rail interventions required to modernise South Africa's network already sit within broader Strategic Integrated Projects (SIP). This means that the rail elements of these programmes do not need to be conceived as stand-alone interventions divorced from wider economic, logistics, energy, industrial or urban development objectives. Instead, they can be positioned as the rail delivery components of nationally recognised infrastructure programmes. The table below consolidates the Strategic Integrated Projects that are most relevant to the NRMP rail programme.

Table 17-1: SIPs Relevant to the NRMP

SIP	Focus Area	NRMP Alignment Projects	Feasibility
SIP 1: Unlocking the northern mineral belt with Waterberg as catalyst	Unlocking mineral resources, primarily coal, chrome, and Platinum Group Metals	Lephalale to Pyramid South, Double Dam to de Wildt, Boshoek loop extend and add turfground loop	The Waterberg coal reserves drive rail development, with potential chrome export growth. Feasibility depends on mineral volumes and transport value. The proposed Botswana rail link could prompt major upgrades to Richards Bay.
		Bulk Export Upgrade-Double Freight Ring	
		Ogies to Richards Bay, Traction power upgrades, Twin Overvaal Tunnel, Grade separation structures at congestion points	
SIP 2: Durban-Free State-Gauteng logistics and industrial corridor	Strengthening logistics and transport between industrial hubs	Restore the Gauteng –Durban corridor to design level	The feasibility of the Gauteng-Durban corridor restoration hinges on shifting logistics to rail for high-value commodities and minimising socio-economic impacts. A modernised rail network would lower logistics costs, reduce carbon emissions, ease highway congestion, and boost economic resilience. Achieving reliable rail connectivity is crucial for the Port of Durban to meet its long-term TEU targets.
SIP 3: South-Eastern node and corridor development	Economic development in Gqeberha, enhancing manganese rail capacity	Manganese expansion on the iron ore line	The manganese rail and port expansions encourage private sector investment due to the commodity's high value. The automotive corridor expansion from Siverton/Kaalfontein to Gqeberha has government backing but awaits tariff agreement with the automotive industry following recent IRERC changes.
		Manganese expansion to Ngqura	
		Automotive expansion to Gqeberha	
SIP 4: Unlocking the economic opportunities in the Northwest Province	Unlocking economic opportunities through investment in infrastructure	Refer to SIP 1	

SIP	Focus Area	NRMP Alignment Projects	Feasibility
SIP 5: Saldanha-Northern Cape Corridor	Rail and port expansion for mineral exports (manganese)	Refer to SIP 3	
SIP 7: Integrated urban space and public transport programme.	Coordinate transport, settlement, and infrastructure planning to develop sustainable, corridor-based urban growth in South Africa's 12 largest cities, including all metros.	Gauteng 9 new lines, 4 extensions	Several of the largest urban settlements in the country have been examined from a population density perspective and proposals are mooted to achieve improved connectivity. The feasibility of these interventions would largely be considered in the realm of socio-economic upliftment and of benefit to passengers in general and to the dense metropolitan areas to reduce the costs of commuting, lessen GHGs, slow down the deterioration of road infrastructure and promote greater safety for commuters.
		Cape Town 4 new lines, 3 extensions	
		Polokwane 1 new line	
		Mbombela 1 new line	
		Bloemfontein 1 new line	
		eThekweni 5 new lines, 3 extensions, 1 tram	
SIP 11: Agri-logistics and Rural Infrastructure	Improving agricultural infrastructure and rural connectivity	B-Network strategy which entails the RFI process to be launched	Rail cost and feasibility – this depends on the responses that will be received from the market once the B-Network strategy goes into full execution. The services that will be implemented by network operators and TOCs would clearly be feasible, cost effective and efficient.
SIP 17: Regional Integration for African Cooperation	Infrastructure projects for economic cooperation with neighbouring countries	Improvements between Pienaar Rivier and Polokwane en route to Zimbabwe	The financial feasibility and trigger points for commencement of detailed planning thereof will depend on the firmed up projected volumes between RSA and the neighbouring countries.
		Improvements to the north-south route through Eswatini	
SIP 21: Transport Infrastructure - Boegoebaai	Enhancing national transport infrastructure and logistics	Refer to SIP 3	

17.4 Rail Master Plan and the Identification of Special Projects

Within the NRMP, Special Projects are not selected based on visibility or policy preference alone. They emerge from the same demand-driven and technically grounded process used across the wider Plan.

The Special Projects, as identified in the NRMP, ultimately fall into two strategic categories. The first comprises high-demand or high-engineering projects, which are generally closer to current network needs and can unlock measurable benefits through brownfield interventions or targeted corridor upgrades. The second comprises standard-gauge projects, which represent longer-term transformational investments intended to raise capacity, interoperability and network modernisation over time.

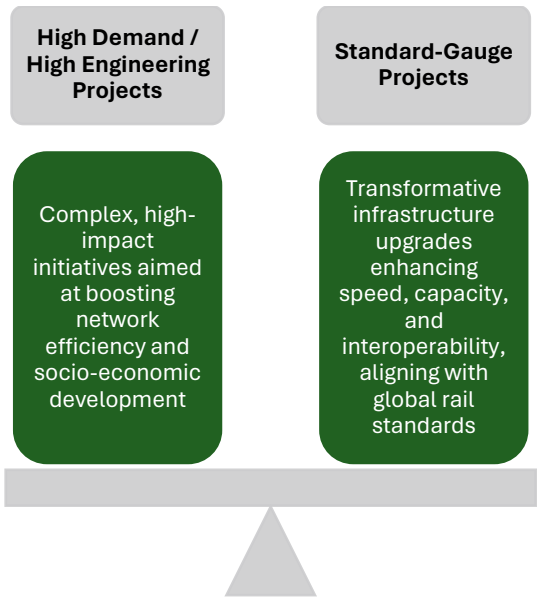


Figure 17-2: Special Projects Categories within the NRMP

17.4.1 High-Demand / High-Engineering

These projects scored highest in terms of both anticipated demand and engineering requirements. Their successful implementation is expected to yield significant returns in terms of network efficiency, throughput, and socio-economic upliftment. Due to their complexity, these projects typically require high levels of investment, multi-agency coordination, and phased implementation approaches.

High-demand / high-engineering projects represent the NRMP's most immediate and economically significant intervention set, because they address corridors where market demand is strongest, engineering constraints are most acute, and early investment can unlock the greatest gains in capacity, reliability, export performance and broader socio-economic impact.

Project 8: Hotazel to Sishen

Strategically aimed at unlocking 12 mtpa of manganese export capacity, this project leverages existing heavy-haul infrastructure with minimal greenfield development. Upgrading the axle load from 20 to 30 tonnes between Emil and Hotazel will enhance efficiency, reduce turnaround times, and improve train slot utilisation.

Project 3: Lephalale to Pyramid South

This project targets increasing capacity to 24 mtpa from the Waterberg coalfields, addressing operational bottlenecks with upgrades such as a double line, loop extensions, and a new chrome compilation yard. The project supports both coal and chrome sectors, boosting export capability via Richards Bay.

Project 15: Coal Line Corridor to Richards Bay

Focused on the Ogies to Richards Bay corridor, this project addresses capacity constraints through key upgrades like a new Overvaal tunnel, Ermelo Yard improvements, and enhanced signalling systems. These interventions support 200-wagon train operations, boosting coal export efficiency.

Project 21: Metrorail Upgrades

Aimed at revitalising Metrorail's commuter services through modern signalling, network improvements, and enhanced rolling stock. The project seeks to restore reliable, safe, and affordable urban rail transport, reducing road congestion and emissions while boosting social equity.

Project 19: Bloemfontein to Gqeberha

This corridor upgrade supports multi-commodity flows, including manganese, automotive, and container traffic. Planned interventions include loop extensions, yard improvements, and increased axle loads, enhancing capacity and operational efficiency.

Project 7: Container Corridor & Terminals and Hubs

Focusing on improving train length, yard capacity, and signal headways, this project aims to boost freight throughput in high-utilisation corridors, particularly the Durban corridor. Upgrades will support longer trains, improve slot usage, and facilitate modal shift from road to rail.

17.4.2 Standard-Gauge Projects

Standard-gauge offers higher speeds, heavier loads, and better stability, making it ideal for modern passenger and freight services. It supports high-value freight and can shift more cargo off the roads.
Key Proposals:

- Gauteng to Durban: Most viable high-speed rail option.
- Gauteng to Mbombela, Polokwane, Bloemfontein: Best options for rapid rail transit.

Strategic standard-gauge lines will be built as greenfield projects to avoid disrupting existing operations.

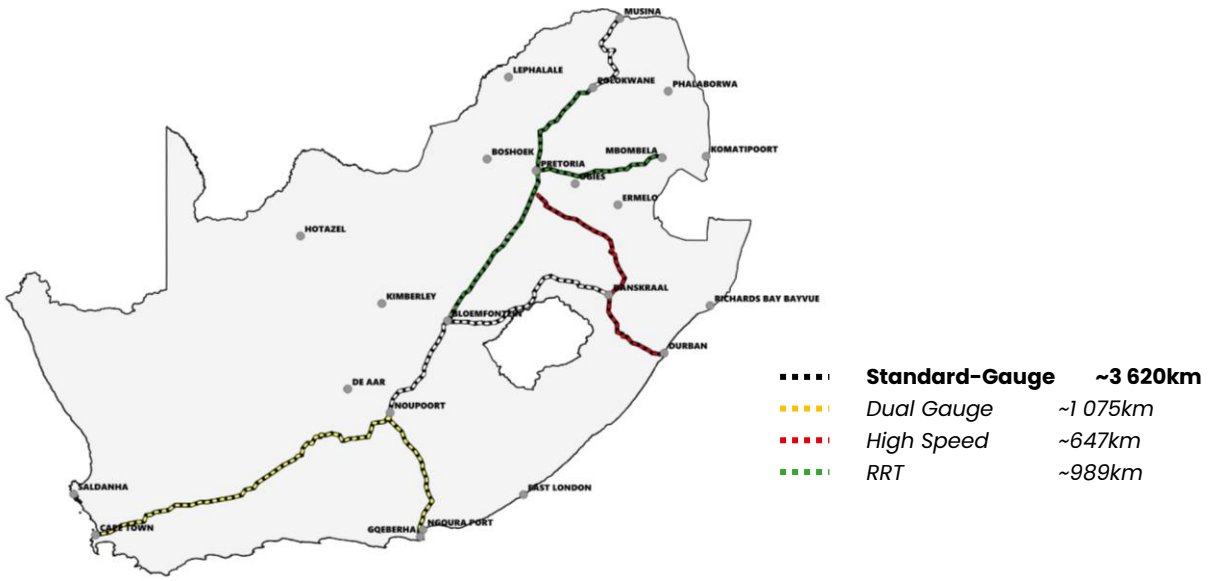


Figure 17-3: standard-gauge Projects

17.4.3 Environmental Feasibility of Projects

Environmental feasibility is an integral part of the Special Projects chapter because many of the proposed rail interventions cross environmentally sensitive areas, urban interfaces or future development zones. The chapter therefore requires environmental considerations to be built into both project identification and project preparation, rather than being treated as a late-stage compliance exercise.

1. Environmental Analysis: Environmental analysis considers how project corridors relate to critical biodiversity areas, protected areas, conservation areas and other sensitive land uses. It also considers the different impacts of brownfield and greenfield interventions. Brownfield upgrades usually have a smaller land-take and can often be accommodated within existing reserves, but they may still trigger significant local environmental management requirements. Greenfield corridors can offer stronger long-term network performance, yet they carry greater environmental, social and authorisation complexity and therefore require more intensive planning and route selection.
2. Environmental Guidelines: The environmental guidelines of the chapter require early screening, route optimisation, avoidance of high-sensitivity areas where feasible, and phased environmental investigation before major commitments are made. They also support the principle that future corridor protection and option preservation should not automatically translate into immediate construction. In the context of long-horizon projects, safeguarding and staged feasibility can be environmentally prudent because they preserve strategic options while allowing better information, stronger design and more informed decision-making to develop over time.
3. Social Guidelines: Social guidelines recognise that railway projects affect communities not only through land and access issues, but also through employment, mobility, urban integration, safety and local economic opportunity. This is especially important for passenger rail, branch line revitalisation and corridor recovery through built-up areas. The chapter therefore supports meaningful stakeholder engagement, attention to settlement patterns, safety and accessibility improvements, and a project preparation approach that balances transport performance with wider public benefit.

The South African railway network, essential for economic and social development, requires strategic planning to mitigate environmental impacts during both operational and expansion phases. Environmental guidelines are based on best practices and data from the South African National Biodiversity Institute (SANBI), focusing on critical biodiversity areas (CBAs), protected areas, conservation areas, and key biodiversity areas (KBAs).

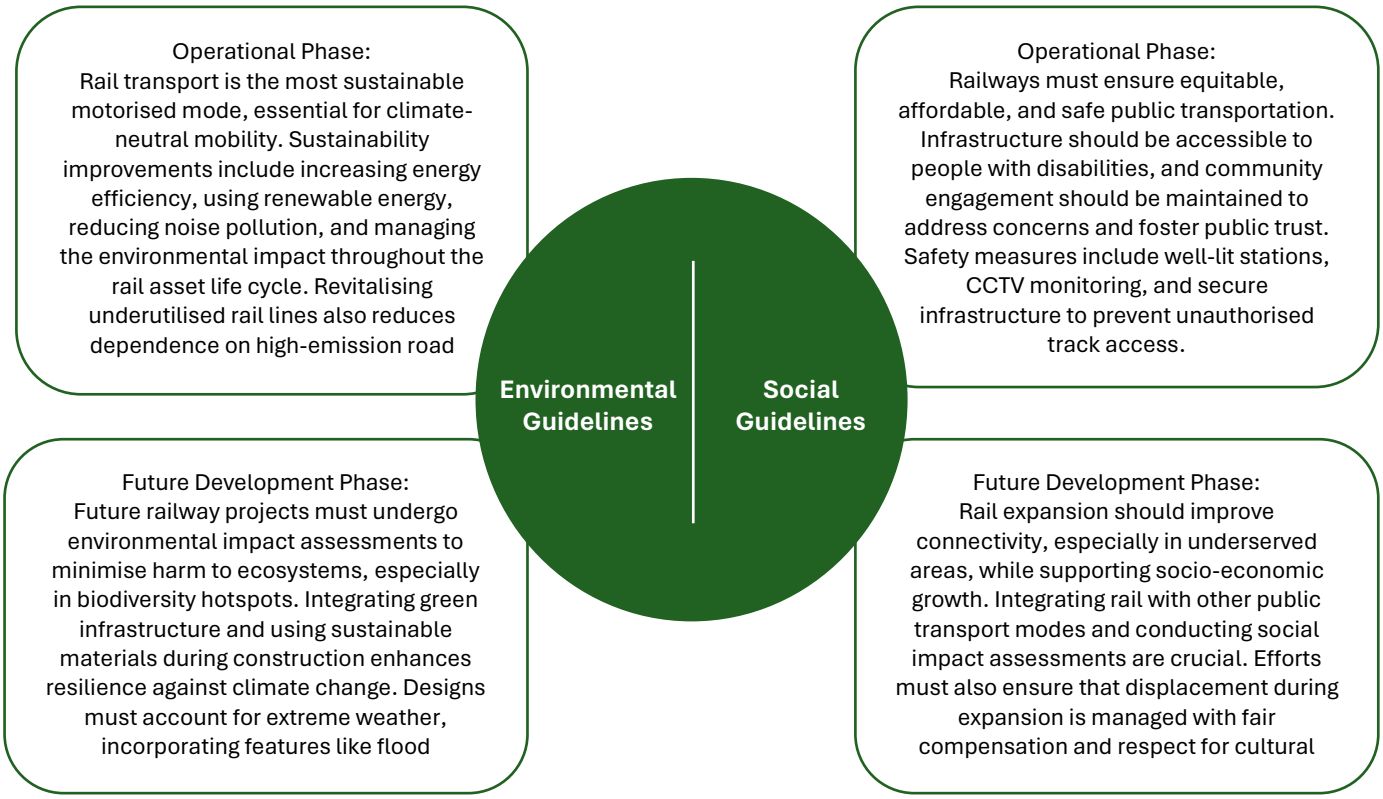


Figure 17-4: Environmental and Social Guidance

17.5 National Rail Master Plan Identification and Prioritisation of Strategic Projects

The identification and prioritisation of strategic rail projects within the NRMP is underpinned by a structured Multi-Criteria Analysis (MCA) framework. The MCA was adopted to ensure that prioritisation decisions are evidence-based, transparent, and aligned with national policy objectives, funding constraints, and delivery realities specific to the South African rail environment.

Rather than producing a simple ranked list of projects, the MCA supports a portfolio-based approach to investment planning. This approach recognises that rail infrastructure delivery must be phased over time and that project selection must balance demand, technical impact, affordability, and implementation readiness to maximise overall network performance.

The MCA is applied through a phased assessment process, which moves from understanding the current network to defining a sequenced and implementable investment programme. The key phases are summarised below:

- Chapter 8 (Infrastructure Statement):
  - Phase 1, Demand Analysis: Establishing current and long-term freight and passenger demand drivers based on economic activity, commodity flows, trade patterns, population density, and spatial development trends, to define the overall market context within which rail interventions are assessed.
  - Phase 2, Rail Market Identification (Road vs Rail Assessment): Identifying rail-suitable markets through road-versus-rail competitiveness analysis, including distance, volume, and commodity characteristics, to determine where rail offers a sustainable economic advantage and where modal shift is achievable.

  - Phase 3, Rail Volume and Network Analysis: Translating identified rail-suitable markets into forecast rail volumes and assessing these against the existing network configuration, axle load limits, train lengths, and corridor capabilities to determine baseline network adequacy.
  - Phase 4, Rail Network Traffic and Volume Loss Analysis: Analysing train movements, slot availability, operational conflicts, and volume losses using operational and simulation modelling to quantify where demand cannot be accommodated under current infrastructure and operating conditions.
  - Phase 5, Intervention Development and Technical Evaluation: Formulating targeted infrastructure and operational interventions and evaluating their technical, operational, and capacity impacts, including loop extensions, signalling upgrades, traction power enhancements, yard reconfigurations, and operational changes.
- Chapter 14 (Rail Funding):
  - Phase 6, Scenario Testing and Assessment: Testing each intervention under baseline, optimistic, and pessimistic scenarios to assess performance under varying demand, cost, and implementation conditions, and to identify projects that remain viable under uncertainty.
  - Phase 7, Prioritisation, Sequencing, and Funding Alignment: Applying MCA outcomes to prioritise and sequence projects in alignment with the Medium-Term Expenditure Framework (MTEF), funding availability, and implementation readiness, to define a phased and fiscally realistic investment programme.
- Chapter 17 (Special Projects):
  - Phase 8, Identification and Integration of Special Projects: Identifying and integrating Special Projects, including Strategic Integrated Projects and other high-impact or transformative initiatives, to ensure alignment with national infrastructure priorities, enable coordinated delivery across government, and support accelerated implementation where strategic and institutional conditions allow.

17.5.1 Prioritisation Plan: How Projects Are Identified and Prioritised

The NRMP adopts a portfolio-based prioritisation framework, rather than a single ranked project list, to ensure that rail investments are sequenced in a manner that is fiscally realistic, demand-driven, and delivery focused. The prioritisation outcomes reflect the application of the MCA, scenario testing under varying demand and cost conditions, and alignment with the MTEF and SIPs. Together, these processes translate long-term rail strategy into an implementable investment programme.

The resulting priorities can be structured across five delivery horizons, recognising differing levels of urgency, economic impact, institutional readiness, and funding complexity.

Table 17-2: Prioritisation Plan

Objective	Delivery Focus	Key Project Themes	Rationale	Indicative Timeline	Primary Leads
Priority 1 — Immediate Recovery and Export Enablement (0–5 years)					
Stabilise the freight rail system, restore lost capacity, unlock export volumes, and generate near-term fiscal and balance-of-payments benefits.	This priority targets brownfield interventions that reinstate design capacity, remove critical bottlenecks, and enable rapid volume recovery on core export corridors.	• Coal export corridor recovery to Richards Bay • Manganese capacity unlocks on the Ore Line and Ngqura corridors • Chrome and magnetite export corridor upgrades • Container corridor reinstatement to pre-decline performance • Network-wide maintenance backlog clearance on A-Network lines	• Highest demand and engineering priority under the MCA • Strong resilience under pessimistic scenario testing • Immediate revenue generation and private-sector appetite • Alignment with SIP 1, SIP 2, SIP 3, and SIP 5	• 2025–2027: Feasibility refinement, approvals, early works • 2027–2030: Phased implementation and operational ramp-up	• TRIM and TOCs • National Treasury • Private Concessionaires
Priority 2 — Urban Passenger Rail Recovery and Economic Densification (5–10 years)					
Restore metropolitan rail as the backbone of urban mobility and support inclusive economic growth and spatial restructuring.	Targeted rehabilitation, reconfiguration, and expansion of high-demand commuter corridors, integrated with urban development and public transport systems.	• PRASA network recovery in Gauteng, Cape Town, and eThekwini • New commuter lines in high-growth urban nodes • Intermodal hubs linked to transit-oriented development	• High social and labour-market benefits • Alignment with SIP 7 objectives • Requires coordinated institutional reform and sustained public funding	• 2026–2029: Planning, institutional alignment, early upgrades • 2029–2035: Network expansion and fleet deployment	• PRASA, Metros, Provinces • National Treasury and Municipal Authorities

Objective	Delivery Focus	Key Project Themes	Rationale	Indicative Timeline	Primary Leads
Priority 3 — Agri-Logistics and B-Network Revitalisation (5–15 years)					
Unlock rural and regional economies while rationalising and right sizing the national rail network.	Market-led concessions and alternative operating models on viable branch lines, supported by targeted infrastructure protection and rehabilitation.	• Agri-logistics branch line concessions • B-Network clustering and rationalisation • Cooperative and private operator participation	• Medium economic impact with strong regional equity benefits • Lower fiscal exposure through concession-based delivery • Alignment with SIP 11 and rural development objectives	• 2027–2032: Market testing, EOIs, pilot concessions • 2032–2040: Scaled rollout based on demonstrated demand	• TRIM • Private Operators • Provinces and Industry Stakeholders
Priority 4 — Strategic Ports and New Economic Nodes (10–20 years)					
Enable transformational trade and industrial growth through new rail-linked economic nodes.	Phased development of greenfield corridors and port expansions, triggered by firm demand and market readiness.	• Saldanha–Northern Cape development corridor • New provincial logistics nodes	• High capital intensity and long lead times • Dependent on global commodity cycles and investor confidence • Suitable for PPPs and Development Finance Institutions	• 2030–2035: Detailed feasibility and market testing • 2035–2045: Phased delivery subject to demand triggers	• DoT, Transnet • DFIs and Private Investors
Priority 5 — Future Network Transformation and Regional Integration (15–30 years)					
Position South Africa's rail system for long-term competitiveness, modal shift, and regional integration.	Strategic safeguarding and optionality for high-impact future investments, without premature capital commitment.	• standard-gauge strategic corridors • Regional Rapid Transit • Cross-border integration with SADC partners	• High engineering complexity and cost • Long-term demand and technology dependent • Focus on corridor protection and staged feasibility	• 2035–2050: Safeguarding, feasibility, optional phased delivery	• • DoT • National Treasury • Regional Partners

17.6 Conclusion

The chapter further confirms that the prioritisation of Special Projects within the NRMP is undertaken through a structured and evidence-based MCA framework, which forms an integral part of the broader NRMP methodology and translates long-term rail strategy into a phased and implementable investment programme. This approach integrates demand forecasting, rail market identification, network capacity analysis, operational simulation, intervention development, scenario testing and funding alignment to assess projects in terms of their strategic importance, economic relevance, operational feasibility and implementation readiness. Rather than producing a simple ranked list of projects, the framework adopts a portfolio-based approach that recognises the complexity of national rail infrastructure development, the need for phased delivery over extended planning horizons, and the importance of aligning investment decisions with funding availability, institutional capacity and delivery constraints. In this way, the NRMP provides a transparent and defensible basis for identifying priority corridors, sequencing infrastructure interventions, and supporting the packaging of future PSP opportunities within the rail sector.

18 KPI's

18.1 Purpose of the Chapter

This chapter establishes the performance measurement framework for the national rail system. It sets out how implementation will be monitored across freight, commuter and regional passenger rail, and defines the core indicators that will be used to measure capacity use, reliability, safety, infrastructure condition, financial performance, customer outcomes and environmental performance. The chapter provides a practical monitoring structure for implementation, accountability and continuous improvement, with practically constituted KPIs to help govern the relationship between all stakeholders in the rail market.

18.2 Introduction

Key performance indicators are a fundamental component of rail sector reform, as they translate strategic objectives into measurable and reportable outcomes. Within the NRMP, KPIs are used to assess whether available rail capacity is being converted into effective service delivery, whether infrastructure condition is improving over time, whether services are becoming safer and more reliable, and whether the rail system is contributing to a sustained modal shift from road to rail. The KPI framework further establishes a common basis for planning, regulatory oversight, investment prioritisation and performance assessment across the rail sector.

Based on the principle of what is measured drives action, the KPIs presented in this section are outcomes of the rail sector's objectives and goals. This section of the document not only focusses on describing the KPIs but explains how these can be used in a properly constituted "incentive and penalties" regime to achieve the goals of the NRMP in South Africa.

The framework is intended to support the development of a modern, efficient and competitive rail system. It provides for consistent performance monitoring across infrastructure managers, train operators, regulators and public authorities, while allowing for application that is responsive to corridor-specific and service-specific conditions. Over time, performance targets should be reviewed and progressively strengthened to improve sector performance and position South African rail closer to the upper quartile of comparable international peer systems.

18.3 Stakeholders

The development of KPIs depends on the active involvement of stakeholders to ensure they are measurable, aligned with national goals, and responsive to sector needs. Collaboration between IM particularly within Transnet and PRASA, the DoT, GMA, TOCs, and regulators (RSR and TER) is essential to align operational, policy, and investment priorities. Early engagement and transparent communication builds trust secures buy-in and ensures that KPIs become a shared tool for driving progress. A coordinated approach is key to building a modern, efficient, and inclusive rail system for South Africa.

18.4 Proposed KPI's

The NRMP includes a defined set of proposed key performance indicators to support the consistent measurement of rail sector performance across freight, commuter and passenger services. These indicators, which are set out in detail later in this document, have been developed with reference to international good practice, stakeholder input and the operational realities of South Africa's rail system.

The framework distinguishes between freight and commuter rail where service characteristics differ, while passenger rail generally follows the freight-based structure with targeted adaptations for commuter service requirements. Each KPI is linked to a specific performance category and is intended to provide clear evidence of how the network is performing, where weaknesses are emerging, and where corrective action or investment intervention may be required. The KPI framework is therefore organised into defined performance categories, with the detailed indicators presented in the sections that follow:

- Operational
- Capacity and Throughput
- Safety
- Financial
- Customers
- Asset Management
- Environmental
- Infrastructure
- Partnership Efficiency
- Rolling stock

Each KPI should be defined using a common structure comprising the KPI name, description, method of measurement, responsible party, target audience, reporting frequency, and target metric or goal. This creates a standardised reporting basis and supports comparability across different institutions and corridors. Though KPI's are used to measure performance, it is important that the KPI's lead to improved behaviour and thus the NRMP notes the relationship between KPIs, penalties, and incentives and the distinction between strategic and operational measures. The National DoT and the IM's KPIs are primarily strategic and assess a safe, reliable, and efficient infrastructure, while the KPIs for an incentive and penalty regime allows for allocation of risk and accountability between the IM and the TOCs an activity level.

18.5 Dependency hierarchy

KPIs must be interpreted through the service delivery chain rather than in isolation. The hierarchy begins with demand and market objectives, then moves to available capacity and funded expansion, followed by service delivery and, finally, performance evaluation. The practical sequence is reflected in three clusters:

1. Cluster one: Ringfence the market and matching resources to demand: Involves setting measurable goals, understanding competitors, defining the target market, assessing existing capacity, and planning for additional capacity.
2. Cluster 2: Delivering the service: Focuses on allocating, mobilising, and managing resources, and recording service performance.
3. Cluster 3: Evaluating performance: Measures service quality and delivery against plans, audits outcomes, and conducts strategic reviews. Rewarding and disciplining of the various stakeholders occurs as a result of this evaluation.

This hierarchy ensures that poor outcomes are not treated only as operational symptoms. Where underperformance is identified, the KPI framework should make it possible to test whether the root cause lies in demand forecasting, slot allocation, infrastructure condition, rolling stock availability, maintenance practice, operating discipline or commercial arrangements.

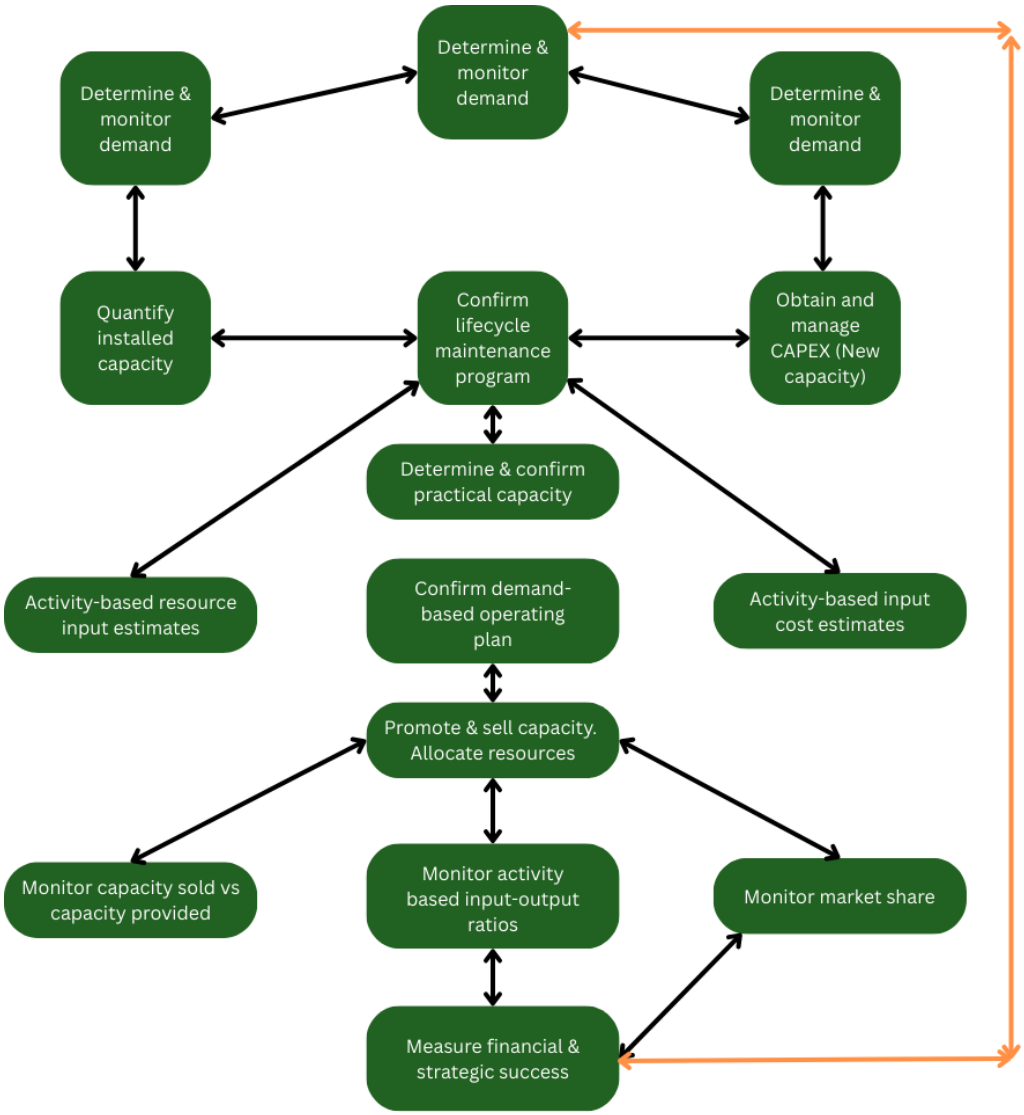


Figure 18-1: Indication of the generic interrelationship amongst the activities that constitute the process of rendering a railway service

18.5.1 KPI's as basis for Rail Incentive and Penalty Regimes

It is important in the South African rail system that the KPI's listed below are also used as the basis for developing a balanced methodology of such operating penalties and performance incentives, between stakeholders in the rail sector. The KPI's will thus be used to define a conforming service on the rail network, based on the principle of an operator who:

a. presents a train to the network within time tolerance, is configured to operate to its schedule and operates in a way that it remains able to maintain its schedule.
b. is running late only due to causes within the network, but only where the root cause is outside the rail operator's control or a Force Majeure event.
c. is running within time tolerance.

Within this framework the IM, Regulators and the TOCs need to be measured in accordance with the KPIs provided and all penalties and incentives, will apply to both TRIM and TOCs equally, subject to the allocation of percentage of blame on the IM, the relevant TOC or other TOCs impacted by the event.

To minimise disruption and improve the performance of the railway network in terms of train delays, a Performance Scheme (Penalty or Incentive) is to be established in the Network Statements of the IMs, which would include:

- The train run delay tolerance within which a train is deemed to run on schedule.
- The expected % share of the TOC trains which will not be delayed due to the TOC's fault.
- The extent of train delay compensation, if the KPIs are not met.
- The penalties to account for disciplining for disruption of the railway network operations.
- The scheme of reward incentives for the TOCs which achieve the mean annual performance above the threshold level specified in the Performance Scheme to be established by the IM.

18.6 Core National Oversight KPIs

For national oversight purposes, the DoT should monitor a focused dashboard of six strategic KPIs. These are the indicators most closely aligned with policy oversight, system performance and implementation credibility.

Table 18-1: Top 6 KPIs for the DoT

KPI	What it measures	Rationale for the Department
Capacity Utilisation Rate	The extent to which available rail capacity and allocated train paths are effectively utilised	This is a core national oversight indicator, as it demonstrates whether existing infrastructure capacity is being converted into actual service delivery, improved market uptake, and a sustained shift of traffic from road to rail.
On-Time Performance	The proportion of freight and passenger services operating within the approved tolerance window	Reliability of service is a key measure of rail system performance. It influences logistics efficiency, passenger confidence, and the overall competitiveness of rail as a transport mode.
Accident Rate and Safety Compliance	The frequency of accidents, injuries and key safety compliance outcomes	Safety remains a matter of national importance. This indicator provides a direct measure of whether the rail system is operating safely, complying with applicable requirements, and capable of supporting expanded use.
Track Condition Index and Infrastructure Condition Monitoring	The condition of track and associated infrastructure, supported by routine monitoring and reporting	The Department requires a national view of infrastructure condition to inform renewal planning, address maintenance backlogs, and reduce operational disruption and safety risk.
Carbon Emissions per Train-Kilometre and Fuel Energy Efficiency	The environmental performance of rail operations, including energy consumption and greenhouse gas intensity	These indicators support the policy objectives of decarbonisation and modal shift and provide evidence of whether the rail system is progressively becoming a more energy-efficient and environmentally sustainable transport solution.
EBIT Margin	The proportion of revenue remaining after operating expenditure, excluding interest and tax	This indicator provides a high-level measure of the financial sustainability of rail operations and infrastructure management. At a national level, it assists the Department in assessing whether the sector is generating sufficient operating surplus to support maintenance, renewal and service improvement, and whether the current funding and cost structure is sustainable over time.

18.7 Stakeholder hierarchy system

The KPI framework should be implemented through a clear hierarchy of accountability, reporting and intervention. The upper tiers should indicate whether the rail system is delivering national policy and economic outcomes, while the lower tiers should explain the underlying drivers of performance improvement or deterioration and identify where corrective action or operational response is required.

Table 18-2: KPI hierarchy and stakeholder ownership

Hierarchy level	Primary owner	Purpose	Illustrative indicators
Tier 1: National outcomes	DoT	Policy outcomes, strategic oversight and reform progress	Modal shift, on-time performance, safety, infrastructure condition, emissions, network capacity use
Tier 2: Regulatory and access oversight	Transport Economic Regulator, Railway Safety Regulator	Compliance, fair access, safety assurance and contract performance	Inspection compliance, slot conflicts, safety compliance, access charge performance, SPAD, contract compliance
Tier 3: Network stewardship	Infrastructure managers	Asset condition, capacity provision, maintenance, network availability and service recovery	Track condition index, infrastructure downtime, traction performance, signalling, offered capacity, faults per kilometre
Tier 4: Service delivery	Access seekers and Train operating entities (TOCs)	Train, wagon, locomotive and passenger service performance	Turnaround time, average speed, dwell time, payload utilisation, fleet availability, train occupancy
Tier 5: Customer and market response	Customers, users and delivery partners, with operator reporting	Market confidence, service experience and wider benefits	Customer satisfaction, complaints, border crossing performance, community benefit realisation

At an operational level it becomes important to minimise disruption and improve the performance of the railway network, a Performance Scheme will be established under the management of the DoT or TER to include:

- The train run delay tolerance within which a train is deemed to run on schedule.
- The expected percentage share of all TOC trains which will not be delayed due to one TOC's fault.
- The train delay compensation.
- The sanctions for disruption of the railway network operations.
- The scheme of incentives for the TOCs which achieve the mean annual performance above the threshold level specified in the Performance Scheme.

This hierarchy should be applied consistently in the implementation, monitoring, reporting and review arrangements. Consultation should focus both on the indicators themselves and on whether each indicator sits at the correct level of ownership and response. Even if there is a difference between an IM and a TOC in terms of operations and scale, there should not be a differentiation between the penalties and incentives that the IM, concessionaire or TOC can reasonably assume, as a difference in size does not mean that one suffers more relative damage at a specific event.

18.8 Summary KPI schedule

The summary below identifies the principal indicators proposed for consultation. It is not intended to replace detailed technical definitions, but to show clearly what will be measured, who will primarily own the measure, and how it supports the hierarchy.

Table 18-3: Summary of KPIs and their Cadence

Hierarchy	Principal KPI(s)	Primary owner	Use	Reporting frequency
Tier 1 - National outcomes	Capacity utilisation rate	DoT	National measure of whether rail capacity is being converted into actual service and modal shift	Monthly, quarterly
Tier 1 - National outcomes	On-time performance	DoT	Core indicator of reliability for freight and passenger services	Monthly, quarterly
Tier 1 - National outcomes	Accident rate and safety compliance	DoT / RSR	National indicator of safe operations and reform credibility	Monthly, quarterly
Tier 1 - National outcomes	Track condition index / infrastructure condition score	DoT / Infrastructure managers	Indicator of network stewardship and renewal need	Quarterly
Tier 1 - National outcomes	Carbon emissions or fuel-energy intensity	DoT / Infrastructure managers / operators	Indicator of climate and efficiency outcomes	Quarterly
Tier 1 - National outcomes	EBIT Margin	DoT / Infrastructure managers / operators	The proportion of revenue remaining after operating expenditure, excluding interest and tax	Quarterly
Tier 2 - Regulatory and access oversight	Inspection compliance, slot conflicts, contract compliance, SPAD	TER / RSR	Ensures access, safety and contractual discipline	Monthly
Tier 3 - Network stewardship	Access charge performance, access revenue per train-kilometre or gross tonne-kilometre, and tariff compliance	Infrastructure mangers	Supports economic oversight of access charging, fairness, transparency and consistency in network access arrangements	Monthly, quarterly
Tier 3 - Network stewardship	Offered capacity, train slot allocation, infrastructure downtime, signalling, traction performance, faults per kilometre, maintenance backlog	Infrastructure managers	Measures whether the network is available, maintained and responsive	Monthly
Tier 3 - Network stewardship	Access revenue per gross tonne-kilometre, cost per gross tonne-kilometre, cost per staff member and cost per line kilometre	Infrastructure managers	Measures infrastructure financial productivity, cost efficiency and the sustainability of network stewardship	Quarterly
Tier 4 - Service delivery	Turnaround time, dwell time, average speed, train payload utilisation, fleet availability, MTBF, MTTR, passenger load factor	Operators / access seekers	Measures whether services are productive and reliable	Quarterly

Hierarchy	Principal KPI(s)	Primary owner	Use	Reporting frequency
Tier 4 - Service delivery	Revenue per tonne-kilometre, revenue per passenger, average fare, labour share of revenue and operating ratio	Operators / access seekers / passenger authorities where applicable	Measures the commercial and service-level financial performance of freight and passenger operations	Monthly, quarterly
Tier 5 - Customer and market response	Customer satisfaction, complaints, notification response time, border crossing performance, community benefit realisation	Operators / Infrastructure managers / project sponsors	Measures whether users and communities experience improvement	Monthly, quarterly
Tier 5 - Customer and market response	Value for service, affordability trends and market responsiveness	Operators / relevant authorities	Measures whether service outcomes and pricing support market confidence, accessibility and continued use of rail	Quarterly

18.9 Disciplinary and Reward Principles for non-achievement of KPIs

On a practical level it is important that when KPIs are not achieved, especially at an operational level that non-performance shall be allocated to the correct party according to the train design, as agreed to between the IM network and the TOC. It is expected that penalties, will apply to train delays by manageable events and not by events such as interference of emergency trains, Force Majeure events, electricity loss due to transmission issues or because of events on a foreign rail network.

When the IM is due to compensate or be compensated by a TOC for a period of train delay en-route or in the yard, it shall be established on the basis of average cost of making railway infrastructure available for corridor related trains, according to access fees. This will be calculated on the basis of operational distance moved for one minute, defined in train-kilometres. The compensation rate for a period of train delay shall be determined as the product of the total of the following items:

- The gross tonkm of the delayed train.
- the freight or passenger traffic run time factor on the relevant corridor (speed).
- the average railway infrastructure access rate for freight trains on the corridor.
- calculation considers factors like:
  - the share of liability between stakeholders for train traffic disturbance.
  - time for the recoverability of normal traffic conditions.
  - the average train delay times.

It will be the responsibility of the IM to coordinate the payment of train delay compensation, between affected parties:

- IM will pay compensation to the TOC, if the TOC trains are delayed by IM or other TOCs.
- The TOC pays train delay compensation to IM for the delays the TOC causes to the IM and other TOC's trains.
- The train delay compensation calculations will be managed by IM and approved with the TOCs concerned.
- The train delay compensations will be settled in cycles.

In the case of incentives to the TOC, rail operator would need to achieve punctuality performance above a certain threshold, such as it uses more than 95% of its allocated slots or if the TOC takes over cancelled slots at short notice.

18.10 KPI Application in a Vertically Separated Rail Network in South Africa

It is recommended that the relationship between a network manager and rail operators be properly managed to ensure the more efficient use of the scarce rail resources in South Africa. The objective of these measurements is to allow a fair and transparent manner for the most efficient rail operators to utilise the scarce rail resources on the national rail network and ensure that rail is competitive against other modes of transport. In Table 18-4, a recommended layout of KPI's for measuring the relationship between the different stakeholders. If this is efficiently and fairly applied, it will best be able to protect the interests of rail clients and the South African economy.

Table 18-4: Recommended format of Operational Performance measures to be applied on the rail network

Performance Measure	Responsibility	Reporting Frequency	Penalties	Incentives
A. Reliability				
1. Number and percentages of conforming train services that exit the Network within or outside of time tolerance levels	Both	Annually	Based on Access Fee lost by TRIM	Based on a % of the total access fee paid
2. Number and percentage of conforming train services that do not achieve arrival within tolerance levels of X minutes due to infrastructure issues.	IM	Annually	Based on Access Fee paid, pay according to time lost at a corridor rate per minute	N/A
3. Number and percentage of Services which exit the Network no later than schedule, within tolerance.	IM and TOC	Annually	N/A	Based on % of total access fee paid, up to a limit of a portion of total access fees.
4. Number and percentage of Services which enter the Network no later than schedule, within tolerance.	TOC	Quarterly	N/A	Based on a % of access fees paid, up to a limit of a stated portion of fees paid
5. Number and percentage of Services which exit the Network later than 30 minutes after schedule. (the time of 30 minutes could vary per corridor)	IM TOC	Annually	Based on Access Fee paid, pay according to time lost at a rate per minute	N/A

	B. Network Availability				
1.	**Transit Time – Infrastructure Configuration Capability[5]**	IM	Annually	Used as basis	Used as Basis
2.	**Transit Time – Infrastructure Practical Capability[6]**	IM	Annually	If greater than 120% of (1) then penalty of X rand per minute lost on section for IM	If equal to 100% of (1) then incentive of 1% of access fee paid by TOC to IM.
3.	**Transit Time – Availability to Market[7]**	TOC	Annually	If greater than 110% of (2) then penalty of X Rand per minute lost on train trip for TOC	If less than 100% of (2) then incentive of X% of access fee paid by IM to TOC.
4.	**Number of slots per corridor, used as basis for calculating capacity on a corridor**	IM	Annually	Less slots available less revenue for TRIM	Higher slots, leads to lower access fee (as fixed costs are covered by more activity) for TOC
	C. Transit Time[8]				
1.	**Number and percentage of Services which transit the Network no later than schedule transit, within tolerance.**	IM TOC	Annually	Based on Access Fee lost by TRIM	Based on a % of the total access fee paid
2.	**Sum of minutes delay (and minutes per hour transit) attributed to below rail cause by type of delay e.g. track, signals/communications, train management/control.**	IM	Annually	Based on Access Fee paid, pay according to time lost at a corridor rate per minute	N/A
3.	**Sum of minutes delay (and minutes per hour transit) attributed to above rail cause by type of delay e.g. late entry, yard/terminal, crew, locomotive, rolling stock, running.**	TOC	Annually	N/A	Based on % of total access fee paid, up to a limit of X% of total access fees.
4.	**Sum of minutes delay (and minutes per hour transit) unable to be attributed to a cause or beyond party's reasonable control.**	Force Majeure Event	Annually	N/A	N/A
	D. Temporary Speed Restrictions				
1.	**Change in number of kilometres and/or percentage of track under temporary speed restriction on the Network at the end of a reporting period versus previous year**	IM	Annually	Pay TER a fee for a negative change	If positive, can fit in more capacity and earn revenue

[5] Transit time over the Network, delivered by the infrastructure given its configuration (alignment, grades, curves and associated permanent speed restrictions). Measured by simulated operation of a reference Indicative Service over the Network (excluding prevailing temporary speed restrictions). Reported based on average speed.

[6] Transit time over the Network, delivered by the infrastructure given its configuration (as measured by Transit Time – Infrastructure Configuration Capability) and maintenance requirements, including impact of temporary speed restrictions, determined by applying the temporary speeds restrictions in place on the Network to a simulation model designed to factor in each temporary speed restriction. Reported based on average speed.

[7] Transit time offered to the market, delivered by the infrastructure given its configuration, maintenance requirements and network usage (scheduled delays for path interactions). Measured by average scheduled transit time for Indicative Services adjusted for any Operator requirements (dwells, deviation from offered section run times). Reported based on average speed.

[8] Transit time is the difference between entry and exit times and so includes all time for all en-route activities (scheduled and actual).

E. Track Condition				
1. Change in track quality measured by index (TQI) per Corridor	IM	Annually	Penalty of X% of track access fee for each decrease of 10% in TQI to all slot users	Incentive Scheme of X% of track access fee in TQI for all slot users on corridor
F. IM Unit Costs				
1. Infrastructure Maintenance (R/track-km, R/GTK) versus target set by TER/IRERC	IM	Annually	Access Fees reduced to mimic target set if unit costs are higher than target	Management bonus if unit costs are reduced
2. Train Control (R/track-km) versus target set by TER/IRERC	IM	Annually	Access Fees reduced to mimic target set if unit costs are higher than target	Management bonus if unit costs are reduced
3. Operations (R/track-km) versus target set by TER/IRERC	IM	Annually	Access Fees reduced to mimic target set if unit costs are higher than target	Management bonus if unit costs are reduced
4. Additional Capacity (Capex Projects) R/track-km)	IM	Annually	N/A	Lower long term access fees

The exact quantum of the penalties and incentives will be developed by the IM and other stakeholders, under the guidance of TER to ensure fairness, transparency and rail efficiency.

18.11 Conclusion

The KPI framework establishes the monitoring and accountability structure required to support the effective implementation of the NRMP. It gives practical effect to the strategic objectives of the Plan by translating them into measurable outcomes, focusing the DoT and other stakeholders on the core indicators required for national oversight, and allocating the wider set of indicators through a hierarchy aligned to institutional roles and responsibilities. Through regular reporting, structured review and ongoing refinement, the framework is intended to strengthen reliability, improve safety performance, support better stewardship of rail infrastructure, enhance service delivery efficiency, and contribute to a more competitive, sustainable and nationally responsive rail system.

Annexure RS_A

SCOPE ELEMENTS CONSIDERED IN THE DEVELOPMENT OF THE ROLLING STOCK STATEMENT

The Rolling Stock Statement was developed through a structured review of the complete rolling stock lifecycle in the South African railway system. To ensure that the recommendations are practical, credible and relevant to a future multi-operator environment, the development process considered 18 scope elements aligned with the four objectives of the Rolling Stock Statement, namely rolling stock entry and acceptance, sustained performance and operational continuity, removal and redeployment, and long-term investment and energy guidance.

Table A-1: Outline of the Rolling Stock Scope Elements Aligned with the Objectives

#	Objective	Scope Elements	Doc Reference
1	**Rolling Stock Entry and Acceptance Guidelines**	a) Vehicle and Infrastructure Interactions b) Rolling Stock Specification c) Manufacturing and Homologation d) Rail Access Commercial Agreement	**Part A**
2	**Operational Continuity *(Sustained Performance, Reliability & Efficiency)***	e) Rolling Stock Asset Management Philosophy f) Fleet Performance Measures g) Rolling Stock Maintenance h) R&D and Engineering Support i) General Overhaul Programmes j) Wreck Repairs k) Insurance Claims l) Fleet Replacement Programme	**Part B**
3	**Removal and Redeployment Conditions**	m) Incident Management n) Deviation Management	**Part C**
4	**Investment and Energy Guidance**	o) Fleet Development p) Fleet Replacement q) Energy Efficiency r) Alternative Energy	**Part D**

Combined, these elements provide the basis for a rolling stock governance framework intended to support safe, reliable and efficient railway operations, while facilitating equitable access and long-term system stability in a multi-operator environment.

Annexure RS_B

VEHICLE AND INFRASTRUCTURE INTERACTIONS

Introduction

It is a fundamental safety requirement that vehicles are only allowed access to the network once they are compatible with the infrastructure. The purpose of this element is to provide guidelines for effective rolling stock and infrastructure interfaces in a multi-operator environment, as envisioned by the National Rail Policy White Paper.

Scope and coverage

Unless otherwise indicated, the guidelines apply to freight, passenger and special purpose rolling stock intended to gain access to the national rail network. All rolling stock must safely and seamlessly integrate with the national rail infrastructure, regardless of the train operator or owner.

As a minimum, and subject to freight and train services envisaged, the IM will provide the information in Table A-2 to enable rolling stock owners and train operators to determine compatibility and safe train design configurations.

Table A-2: Minimum Recommended Rolling Stock and Infrastructure Interface Elements

#	Parameter	Description
1	**Track Gauge**	The Network Statement shall describe the characteristics of the railway infrastructure, including track gauges, track topography, loading profiles, axle weight limits, traction power supply and moving vehicle gauge (maximum height and width of vehicles). These parameters are critical for ensuring rolling stock compatibility with infrastructure across the entire network or journey.
2	**Technical Access Conditions and Regulations**	The IM will provide information on technical specifications of network access to facilitate a safe interface with the rolling stock, covering amongst others: • Static and dynamic axle loading conditions., ratings and bridge safety operating limits • Static and dynamic vehicle structure gauge • Traction power requirements for electric-powered rolling stock for safe and efficient operation • Wheel/Rail interface profile • Minimum curve radii
3	**OHTE Configuration**	A comprehensive technical specification of network access requirements for electric-powered rolling stock for safe and efficient operation. The IM shall provide detailed specifications and descriptions of the electrical power supply system and OHTE configuration for each corridor and/or section, enabling rolling stock owners and TOCs to properly assess compatibility and

#	Parameter	Description
		energy-efficient designs and operation. These include energy supplier requirements, e.g. NERSA or ESKOM.
4	**Compatibility and Interoperability (Various Sections)**	The IM shall provide minimum requirements for rolling stock compatibility and interoperability across various sections to optimise performance, maximise energy efficiency, minimise wear and tear on rail tracks, to optimise operational costs. Examples may include maintaining wheel profiles and loading profiles within specified safe operating ranges. The IM shall make these requirements/specifications readily available to TOCs through the Network Statement or online platforms.
5	**Signalling System and Communication System**	The Network Statement shall describe signalling requirements, characteristics and regulations, including any on-board devices/technology fitted on the rolling stock and emergency signalling protocols. These include electromagnetic interference (EMI) and radio interference levels.
6	**Service and Technical Facilities Access Conditions**	The IM shall provide a comprehensive list of all services and technical facilities along the network, along with a guide of their purpose, capability and operating guidelines, allowing TOCs and rolling stock owners to plan trains for minimal disruption or quick recovery in case of incidents.
7	**Integrated Incident Management**	The IM shall consider a centralised system for real-time monitoring of trains and infrastructure conditions, providing immediate alerts for deviations from normal safety or operational conditions and coordinating communication and response among stakeholders. An emergency response plan detailing roles and responsibilities in the event of an incident shall also be established.

Overview of Current State

Of the three potential IMs, Transnet, PRASA and Gautrain, only Transnet has published a comprehensive network statement. PRASA and Gautrain are yet to do so. Therefore, the review of the current state is based on the Transnet Network Statement Volume 3 (December 2024). The table below provides a current view, not based on infrastructure condition, but the extent to which the IM has provided the required information.

Table A-3: Transnet Network Statement: Comparative Analysis of Vehicle and Infrastructure Interface

Parameter	Coverage Rating	Areas of improvement / consideration
Track Gauge	Adequate	
Technical Access	Adequate	Minimum curve radii provided per corridor.
Power Supply & OHTE	Not Adequate	Specify OHTE clearance profiles and current limits per section.

Parameter	Coverage Rating	Areas of improvement / consideration
		Voltage distortions, unbalanced loads and harmonics • The presence of unbalanced loads (such as single-phase loads) and harmonics generated by modern AC traction power converters in the OHTE is a significant concern for both Eskom and other operators sharing the same electrical section. These conditions can lead to network instability and resonance phenomena, including voltage doubling. • ESKOM uses standards such as NRS 048-2 to assess the distortion of waveforms and harmonics introduced into its power supply network at the point of common coupling. • Harmonics can also adversely impact other TOC's locomotives operating on the same line, resulting in overloading or malfunctioning of other locos' or substations' filter equipment, or even causing severe voltage distortions that could result in a voltage doubling phenomena (flash overs). • These complex interactions are difficult, if not impossible to predict, especially in the absence of sophisticated and detailed simulation models of substations, OHTE and other locomotives' equipment and proprietary control techniques. Extensive on-site testing is required to assess interactions. Resonance-induced voltage distortions may require extensive modifications to the TCU or control software. Energy Management • The IM shall specify the standardised energy measurement equipment required on all rolling stock, particularly for operations under electrified power supply. The European standard EN 50463 – EMS provides a useful reference framework. • Several challenges are anticipated, including issues related to the definition of consumption points, autonomous operation of measurement systems, verification and approval processes, and data communication protocols. Historically, simpler and cheaper solutions were accepted, but this approach is no longer viable in a multi-operator environment where accurate energy measurement is critical, especially when Transnet bears the cost of energy usage.
Compatibility & Interoperability	Not Adequate	Inter-operability information require improvement. *Recommendation A: EMI Approvals for Signalling Systems*

Parameter	Coverage Rating	Areas of improvement / consideration
		It is recommended that explicit reference be made to the requirement for EMI approvals relating to potential interference with signalling systems. Clear roles and responsibilities should be defined, including who will conduct the tests and where they will be performed. Historically, these tests were carried out at isolated test facilities to avoid interference with other operations, 25 kV AC tests at Bela-Bela and 3 kV DC tests at Ventersdorp (Potchefstroom), on dedicated, segregated tracks. A similar approach shall be considered for future testing to ensure system integrity and safety. *Recommendation B: Addressing Harmonics, Load Unbalance, and Communication Interference* Potential challenges with Eskom relating to harmonics and unbalanced single-phase loads must be acknowledged and addressed through further clarification and structured negotiations. The requirement for psophometric current testing shall be specified, given the risk of interference with a broad range of communication systems, not limited to telephone lines. It is also recommended that current Transnet standards in this area be reviewed and updated to align with international best practices. This may require collaboration with global experts and testing facilities with experience in radio emissions and electromagnetic compatibility, such as those in Europe and China, which have historically supported such evaluations. *Recommendation C: Managing Resonance, Voltage Doubling, and Liability for Interference* Resonance issues, such as "voltage doubling", and the potential for unwanted interactions between rolling stock from different suppliers, or with traction power substation filter and auxiliary supply equipment, shall be explicitly addressed. These phenomena have previously led to significant incidents during the introduction of new locomotives, including damage to existing fleet assets (e.g. in Saldanha and Ermelo). In the past, Transnet absorbed the liability for such damage. In a multi-operator environment, it must now be clearly defined: • Who will be held accountable when newly introduced rolling stock negatively impacts existing assets? • What mechanisms will be in place to resolve such disputes? • Who will act as the independent arbitrator or authority?

Parameter	Coverage Rating	Areas of improvement / consideration
Signalling & Communication	Not Adequate	Outline future digital signalling integration plans. EMI, not only presents risks with interference with signalling equipment, but also presents a potential interoperability risk when multiple types of rolling stock operate on the same network. A fresh reminder are the challenges that are intermittently being experienced with interference with ECP-brake equipment communications due to mast-rail bonding defects. The IM shall provide a clear guidance to minimise and manage this risk, including the requirement for EMI testing by an independent, competent aauthority. Historically, this expertise existed within Transnet, and consideration shall be given to re-establishing or accessing such capability to support consistent and reliable testing. The proposed Rail Industry Standards Board (SARISB) could serve as a central authority for coordinating and overseeing these efforts.
Service Facilities	Partial	Guidelines are presented, but access is yet to be clarified.
Incident Management	Adequate	

The current Transnet Network Statement provides comprehensive information to assist rolling stock owners in assessing compatibility. However, the infrastructure specification is not always a representation of the current condition, which may introduce new risks. The IM is required to communicate these deviations timeously to all TOCs as soon as they become available.

Annexure RS_C

RECOMMENDATIONS FOR IMPROVEMENT AND TRANSITION TO FUTURE STATE

The following proposals and recommendations are made to facilitate the transition from the current to future state in respect of the certification of rolling stock entering the national railway network. These measures aim to establish a uniform, transparent, and enforceable certification process that ensures safety, promotes interoperability, and supports equitable access across all operators and infrastructure managers.

They are categorised to distinguish between mandatory regulatory requirements, essential implementation measures, and desirable enhancements that support long-term sustainability and innovation.

Table A-4: Proposed Recommendations for Rolling Stock Certification

Problem Statement: The absence of a nationally standardised, independent, and enforceable rolling stock certification process undermines safety, interoperability, and equitable access in a multi-operator railway environment.	
Identified Gaps • Absence of uniform or national certification framework for rolling stock entering the Network from multiple operators. • Absence of a centralised assurance process that verifies compliance with safety, technical, and interoperability standards for all rolling stock in the country. • Risk to network reliability and integrity due to varied levels of compliance, especially in a multi-operator environment Opportunity Introduce a unified certification framework that ensures all rolling stock, regardless of ownership, meets defined national safety, technical, and interoperability standards, enabling transparent access and maintaining network integrity.	
Proposal for Improvement The following proposals are made to address the identified gaps and to explore the available opportunities:	**Owner**
Recommended as Mandatory Requirements	
It is proposed that a SARISB be established comprising of both public (DoT, RSR, TER) and private stakeholders (TOCs, Manufacturers and affected parties) to establish and lead the development of railway standards, rolling stock being one of the categories, and facilitate the implementation of transition phase in relation to safety and technical standards.	**DoT**
It is recommended that the SA Rail Industry Standards Board shall establish, adopt and implement the following initiatives: Establish and implement a national rolling stock certification framework, aligned with IEC 61133, EU Regulation 1302/2014 (TSI) as well as the Australian AS 7501:2019 specifications.	**SARISB**

Establish and require that all rolling stock shall obtain certification through accredited process entities and determine a fair and equitable period and process to manage the transition period for this compliance. The goal is that this certification shall be a pre-requisite to entry the Network and recognised evidence by the IM. The RSR to ensure annual rail worthiness certification are issued by accredited institutions, and mandatory to all rolling stock that remains in operation on the Network. Determine the framework to monitor and enforce compliance verification by IMs and TOCs as part of access agreements. It is additionally recommended to identify all rolling stock technical specifications and information (including drawings and reports) that were previously developed for managing Transnet's rolling stock, which could qualify as national standards. These documents shall be made available to compile the SARISB for consideration and adoption in the national railway industry.	RSR, ROSCOs, TOCs, Industry Representatives
Recommended as Essential Requirements	
In addition to the above mandatory proposals, the SARISB and the DoT shall consider the following recommendations as essential to facilitate the transition in respect of the rolling stock management. • Establish a national register of certified rolling stock, with comprehensive rolling stock data register as adopted by AS7501. • Require testing, inspection, and certification to be conducted or validated by independent, accredited engineers or institutions. • Include certification and compliance status as part of network access evaluation. • Provide transitional support to small/private operators to align with the national certification standard.	**SARISB** RSR, ROSCOs, TOCs, Industry Representatives
Recommended as Desirable Requirements	
In addition, the following recommendations are desirable to facilitate the transition in respect of the rolling stock management. • Develop a mutual recognition agreement for rolling stock previously certified under comparable international standards. • Incorporate digital tools for certification tracking and compliance monitoring.	**SARISB** RSR, ROSCOs, TOCs, Industry Representatives
The following guidelines shall be considered for this framework:	
Implementation Strategic Considerations	When implementing the recommendations, the SARISB shall consider the following initiatives to facilitate transition (change management): • Pilot program for certification with selected TOCs and accredited entities. • Develop a phased implementation plan with clear transition timelines for existing and new operators. • Promote capacity-building programs for inspectors, certifiers, and operators.
Regulatory Oversight and Standardised Framework	**Regulatory Framework Development**:

	Reference proven models such as the Australian RISSB framework and the EU's Technical Specifications for Interoperability (TSI) for rolling stock certification. Develop a transparent regulatory framework in collaboration with the RSR and Economic regulators, to standardise certification and oversight services in respect of: ● Determination of accredited certifying bodies ● Annual audits ● Dispute and grievance mechanisms for operators ● Derogation procedures ● Enforcement protocols for non-compliance **Role Clarification** To ensure clarity of roles and accountability, the certification framework shall clearly distinguish between regulatory oversight and technical standard-setting responsibilities. ● The RSR will retain its statutory mandate for regulatory enforcement, including the issuance of Rail Safety Permits, oversight of certification audits, and compliance monitoring. ● However, the development and maintenance of technical and testing standards, including rolling stock interface specifications, homologation criteria, and acceptance procedures, shall be led by the proposed South African Rail Industry Standards Board (SARISB). ● The SARISB, comprised of both public and private stakeholders, will coordinate the adoption of harmonised standards aligned with international best practices (e.g., IEC 61133, TSI, AS 7501). ● Under this framework, operators (TOCs, ROSCOs) shall be responsible for ensuring that their rolling stock complies with SARISB-defined technical requirements, while the RSR shall continue to serve as the regulatory authority verifying certification outcomes, enforcing compliance, and managing risk at a system level.

Annexure RS_D

PROPOSED ENTRY AND ACCESS REQUIREMENTS

To support a multi-operator railway environment, a standardised certification process is essential. This process shall be adopted and accepted by all stakeholders, including IMs, TOCs, ROSCOs, and regulatory bodies. The process shall be:

- Objective and evidence based.
- Aligned to both national and international (e.g. IEC 61133, EU TSI) standards.
- Capable of confirming that rolling stock meets the mandatory access requirements summarised in Table A-5.

This will ensure uniform safety and performance expectations across the network, enable interoperability, and support equitable access.

Table A-5: Mandatory Rolling Stock Access Requirements Scope

#	Mandatory Requirements	Short Description
1	**Vehicle and Infrastructure Interfaces**	The rolling stock must comply with the minimum safety and operational parameters of vehicle and infrastructure interfaces for each corridor, section or line where the rolling stock is to be operated.
2	**Rolling Stock Specification**	In addition to compliance with the vehicle and infrastructure interfaces above, the rolling stock shall be suitably specified to safely operate and carry out the intended application and/or train service. Specific approval and/or homologation certification will demonstrate the fitness for purpose.
3	**Manufacturing / Modification / Homologation**	All rolling stock entering the national railway network shall be subject to specific approval to demonstrate the fit-for-purpose, including: • New rolling stock • Modified rolling. • Redeployed rolling stock (existing but entering the National Network or corridor for the first time)
4	**Certification and Compliance**	Accepted rolling stock shall undergo regular compliance and certification to ensure sustained rail worthiness. • Compliance of the accepted rolling stock shall be confirmed per trip by the TOC and/or IM as per the access provisions of the agreement. • The TOC shall ensure that all accepted rolling stock receives rail worthy certification annually (minimum) issued by an accredited industry or statutory body.

#	Mandatory Requirements	Short Description
5	**Operational & Commercial readiness**	Licence to operate or RSR approval shall be available to allow the TOC to conduct on track tests to facilitate the certification, as well as operations. The TOC and/or ROSCO shall have valid liability insurance for all accepted rolling stock operating on the national rail network, as per IM stipulations.