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DEPARTMENT OF PUBLIC WORKS AND INFRASTRUCTURE

NO. 2673 **21 October 2022**

NATIONAL INFRASTRUCTURE PLAN 2050 PHASE 2 FOR PUBLIC COMMENTS

1. The Department of Public Works and Infrastructure (DPWI) invites public comments on the draft National Infrastructure Plan 2050 Phase 2.

2. Written submissions should reach the DPWI on or before 09 December 2022. Submissions should be directed to the Deputy Director-General: Infrastructure Investment Planning in any of the following ways:
    a) Delivered by hand to DPWI, 256 Madiba Street, Pretoria Central, Pretoria.
    b) Emailed to NIP2050Phase2@dpw.gov.za

3. Any enquiries should be directed to Mr Charles Mabuza, Lead: National Infrastructure Plan at 011 269 3128.

P. de Lille

MS PATRICIA DE LILLE, MP
MINISTER OF PUBLIC WORKS AND INFRASTRUCTURE
DATE: 21 October 2022

South Africa

Draft National Infrastructure Plan 2050
Phase 2 – Distributed Infrastructure

'NIP 2050'

September 2022

Draft NIP 2050 Phase 2

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EXECUTIVE SUMMARY

Infrastructure development is critical to attaining South Africa's long-term economic and social goals. In the context of a developing country seeking significant structural change, the public sector must lead this effort. Infrastructure delivery will be one of the most significant contributors to South Africa's transition from a historically closed minerals economy to one that is globally and regionally integrated, inclusive and host to the dynamic industries of the future.

Public infrastructure investment is central to achieving greater productivity and competitiveness, reducing spatial inequality and supporting the emergence of new job-creating sectors. It is therefore one of the non-negotiable foundations of transformation and inclusive growth. The construction of infrastructure generates employment and broad-based black economic empowerment opportunities, further contributing to the goals of the National Development Plan (NDP).

The NDP targeted a 30% investment-to-GDP ratio, one-third of which would be delivered by the state. This is primarily delivered through provincial and local government and state-owned enterprises (SOEs). A small proportion of spending is directed through national government. The cost of delivering infrastructure to achieve NDP development objectives is estimated to exceed R6 trillion between 2016 and 2040, with energy and transport accounting for over 72% of this spend.

The goal of the National Infrastructure Plan 2050 (NIP 2050) is to create a foundation for achieving the NDP's vision of inclusive growth. Prepared by Infrastructure South Africa (ISA), the NIP 2050 offers a strategic vision and plan that link top NDP objectives to actionable steps and intermediate outcomes. The aim is to promote dynamism in infrastructure delivery, address institutional blockages and weaknesses that hinder success over the longer term, as well as guide the way towards building stronger institutions that can deliver on NDP aspirations. The NIP 2050 does not seek to be comprehensive – it is not meant to be a database of all projects, a consolidation of master plans, a spatial mapping of projects or a mechanism for centralised decision-making. Rather, its purpose is to identify the most critical actions that are needed for sustained improvement in public infrastructure delivery and that will have impact in the short term, but with the longer-term imperatives also in view.

The NIP 2050 has been prepared in two phases, distinguishing between large bulk investments that offer the foundation and 'distributed infrastructure' that link more closely to businesses and communities.

The NIP 2050 Phase 1 focused on bulk infrastructure related to energy, water, freight transport and telecommunications. The NIP 2050 Phase 1 also attended to strengthening institutional capabilities for delivery and for infrastructure finance, building an Africa regional infrastructure agenda, revitalising the civil construction sector, and monitoring and evaluation. After significant public consultations, it was approved by Cabinet in March 2022 and is available at https://www.gov.za/sites/default/files/gcis_document/202203/46033gon1874.pdf.

NIP 2050 Phase 2 focuses on 'distributed infrastructure'. It is organised into two main sections. The first section offers insight into six infrastructure areas, namely human settlements; municipal electricity, water and sanitation, and solid waste; passenger transport; road infrastructure; education infrastructure; and health infrastructure. There are then three cross-cutting sections focused on digital infrastructure, crime and corruption, and governance of distributed infrastructure delivery. Each section follows the same format: (1) stating the vision, (2) offering a frank assessment of the current status, (3) outlining essential conditions for success, and (4) stating what will be done to achieve the vision and conditions for success. With an eye to long-term success, there is significant emphasis on near-term course correction. To this end, the NIP 2050 offers direction in strengthening and augmenting government's Strategic Integrated Projects (SIPs) that are relevant to the six sectors, as well as three-year action plans.

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Context for the NIP 2050

The NIP 2050 is prepared in a context where there are strong drivers of change, most notably the following:

- Growing sociopolitical strains arising from high levels of inequality and poverty, with intensifying demands for better delivery at the local level.
- Rapid urbanisation, deepening the need for responsive planning and densification.
- Demographic trends that currently point to a large youth population, but by 2050 will point to an aging population.
- A commitment to environmental sustainability, especially in respect of achieving carbon neutrality.
- A global trend towards the Fourth Industrial Revolution (4IR) and the e-enablement of all things. It is an opportunity to promote inclusion and service efficiency, but also a threat where digital exclusion deepens inequality.
- Rapid technological change across infrastructure sectors.
- Growing global and local capability to shape innovative public–private partnerships and alliances in infrastructure delivery and finance.
- A global movement towards greater public sector transparency and accountability.
- Crime and corruption, which have reached a tipping point, with tentacles into global crime networks.
- The need to industrialise and create employment, and the opportunity afforded by a significant infrastructure programme.
- Uncertainties and opportunities afforded by South Africa's positioning on the African continent.
- South Africa's institutional and partnership opportunities in relation to promoting gender and race transformation and technical capabilities by growing the community of skilled black professionals and companies in the built environment.

As in the NIP 2050 Phase 1, this Phase 2 document gives guidance on themes common to the six sectors that would see significant emphasis placed on building capacity in the following:

- **Knowledge and innovation services**, for capability in planning, monitoring, budgeting, finance, procurement, project preparation, project management and sector-specific innovation. This enables evidence-based decision-making, improves cost-effectiveness, mitigates risk, and helps optimise and can contribute significantly to improving infrastructure quality, delivery and sustainability. Building these capabilities will be the NIP's top priority.
- Public–private cooperation and stimulation of competition, where appropriate, in the delivery of public infrastructure.
- **Spatial transformation** to promote more inclusive development in line with the National Spatial Development Framework.
- **Blended project finance** and innovative green finance.
- Executive management and technical capability within the state and its entities, so that they are stable and can lead and deliver with confidence.
- Economic regulation.
- **Industrial development and localisation** in the design and approach to implementation.
- Efficient modes of delivery.
- A safe, secure and ethical environment for public infrastructure delivery.
- **Environmental sustainability,** including the contribution to achieving net-zero targets.

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SIGNS OF PROGRESS

Stimulating momentum in public infrastructure delivery is a commitment taken seriously. Some of the most important requirements of the NIP 2050 are already being implemented. Some examples are the following:

- **In human settlements:** The National Department of Human Settlements is developing a new human settlement policy white paper that aims to reform the housing subsidy scheme and delivery systems to enable partnership between the public and private sectors. A number of metropolitan cities are actively developing policies and programmes to enable small-scale affordable rental (or backyard rental) form of development as a contribution to orderly urban densification. The in situ upgrading of informal settlements as opposed to relocation is increasingly being promoted by the National Department of Human Settlements, enabling households to build on their investments and maintain the networks that they have established.
- **In water:** A permanent director-general has been appointed in the Department of Water and Sanitation (DWS), a critical step in improving departmental governance and delivery. A national water services improvement plan has been developed. A water partnerships office is being established at the Development Bank of Southern Africa (DBSA), modelled on the successful Renewable Energy Independent Power Producer Procurement Programme (REIPPP) office. National Treasury's (NT's) City Support Programme is actively strengthening water delivery in metros.
- **In roads:** The South African National Roads Agency (SANRAL) has made significant progress in its road projects around the country, with nine construction projects valued at R18 billion in progress and a further eight major projects valued at R20 billion having been awarded in 2021.
- **In energy:** Government has committed to removing licence limits for embedded generation.
- **In passenger transport:** There has been progressive implementation of starter Integrated Passenger Transport Network (IPTN) services in four cities. Institutions able to drive integrated transport planning are being strengthened in Gauteng and Cape Town. A digital clearing house that will act as a backbone for a national transport user payment system has been established.
- **In education:** By 2017 there was provision of electricity at 99% of schools as well as internet at 20%, computers at 33%, drinking water at 100% and sanitation at 99% of schools. The Accelerated Schools Infrastructure Delivery Initiative and the Sanitation Appropriate for Education programmes have been established to make schools safe. Through the programmes mud and other inappropriate schools have been demolished and replaced, with 130 new schools constructed, and 489 schools have been provided access to water and 2 650 existing schools access to sanitation.
- **In health:** More than half of the 3 472 public primary healthcare facilities qualify as 'ideal clinics'. Healthcare and education facilities infrastructure upgrades have been implemented according to the Framework for Infrastructure Delivery and Procurement Management (FIDPM).
- **In fighting infrastructure crime and corruption:** The effort to combat crime and corruption is deepening: The South African Police Service (SAPS) recently established the Essential Infrastructure Task Team to improve the policing of infrastructure-related crime, and the Department of Trade, Industry and Competition (DTIC) and NT are finalising an approach to fighting infrastructure crime in relation to copper and steel.

Infrastructure sectors

Human settlements

Features of human settlements infrastructure by 2050

Affordable housing and infrastructure will be accessible for all South Africans within well-managed and viable socially and economically integrated communities, located in areas allowing convenient access to economic opportunities and health, education, recreation, and other social amenities.

There will be sustainable provision of a range of affordable housing options, as well as the provision and ongoing maintenance of adequate and accessible urban infrastructure and services to households and other end users in human settlements.

These infrastructure and related services include energy, water and sanitation, solid waste, roads and digital infrastructure, as well as passenger transport and social facilities and services that reach end users themselves.

Infrastructure networks and municipal services will underpin sustainable development, assist in overcoming spatial inequality, and drive economic growth, wealth creation, poverty alleviation and equity.

How it will be done

- The human settlements strategy, policy and planning frameworks as well as the associated institutional environment and mandates will be clear and aligned.
- Institutional and professional capacity in the state institutions, entities, government, and municipalities will be robust.
- Regulatory processes will be efficient and enable the delivery required to meet the 2050 vision.
- Municipal funding for human settlements will be sufficient and sustainable.
- There will be a programme of rapid innovation and change in land, infrastructure, and human settlements delivery.
- Human-settlements-related infrastructure will be climate resilient.

Municipal electricity, water and sanitation, and solid waste

Features of trading services infrastructure by 2050

Municipal electricity, water and sanitation, and solid waste services will be delivered to enable universal access to sufficient, reliable, and affordable services, supporting an inclusive economy and thriving households. These services will be efficiently managed and will be financially and environmentally sustainable.

How it will be done

- The institutional framework and governance arrangements will be fit for purpose.
- Management will be effective, supported by adequate technical capability.
- Trading services will be financially sustainable.
- The private sector will participate effectively.
- Policy and regulatory frameworks will be supportive – in respect of price setting, procurement and contracting, and with stronger enforcement of legislated standards and enabling step-in options as required to ensure service delivery.

Specific to sectors:

- Operating licences will be used as a key instrument for structural reform of the municipal electricity distribution business.
- In municipal water delivery, a diversity of delivery models will be implemented, with a differentiated approach between cities, towns and rural districts.
- Competition and new delivery models will be introduced into waste collection.

Passenger transport

Features of passenger transport infrastructure by 2050

By 2050, the passenger transport sector will facilitate efficient and affordable access by all South Africans to economic opportunities, social interaction and services. Passengers' needs for reliability, dignity, security, safety and health while travelling will be met, with environmental sustainability promoted.

How it will be done

- Integrated planning will be robust and leverage coordinated action.
- Funding allocation and funding sources will be sustainable and aligned with strategic goals.
- Modes of transport will be integrated and well aligned with passenger needs.
- Transport will be made safe and secure for all users.
- Passenger transport will contribute to South Africa's environmental objectives.
- State capacity to plan, implement, regulate, enforce and monitor public transport sector projects will be robust.
- The passenger transport sector will be agile and adaptable to changing transport realities.

Roads

Features of road infrastructure by 2050

South Africa's road network will support the movement of people and goods in an efficient, affordable, safe and environmentally sustainable manner. By 2050, there will be less reliance on roads and there will be greater domestic and regional integration of inter-modal transport and a more balanced use of rail and air freight.

How it will be done

- Road transport planning will be integrated.
- Road networks maintenance and build will be financially sustainable.
- State capacity to oversee the road network will be robust.
- There will be strong state capability to work with the private sector.
- There will be strong capacity to deploy technology and innovation.

Education infrastructure

Features of education infrastructure by 2050

Education infrastructure will support the delivery of high-quality, accessible education from early-learning, primary and secondary to tertiary and vocational levels. Education infrastructure will be adaptable and responsive to changing requirements over time, in respect of typology, location and orientation. Facilities will be safe, secure and clean, with water, sanitation, ablutions and security. The built environment and equipment will be conducive to teaching and learning. Affordable transport and broadband will be available to anyone that needs it for access to learning. Buildings will be environmentally sustainable.

How it will be done

- All learners will have access to quality education facilities to ensure globally competitive educational outcomes.
- Existing education infrastructure will be rehabilitated and maintained.
- Education planning capacity will be proactive, robust and responsive.
- Decision-making will be accountable and institutions effective.

Health infrastructure

Features of health infrastructure by 2050

Health infrastructure will support the delivery of high-quality accessible healthcare, leading to life expectancy of at least 70 years for men and women, as envisaged in the NDP. Health infrastructure will be flexible, adaptable, resilient and responsive to changing requirements over time. Facilities will be safe, secure and clean, with water, sanitation, electricity and required equipment.

How it will be done

- Everyone will have access to quality health facilities supportive of globally competitive health outcomes.
- All health facilities will operate at acceptable standards suited to equitable quality service delivery.
- Health infrastructure will be financially sustainable.
- There will be robust partnerships and alliances between the state and private actors.
- Existing health infrastructure will be rehabilitated and maintained.
- Health planning capacity will be proactive, robust and responsive.
- Decision-making will be accountable and institutions effective.

Cross-cutting support to the infrastructure plan

Digital capabilities in infrastructure

Features of digital capabilities in infrastructure by 2050

The NDP envisages a seamless information infrastructure that is universally available and accessible, at a cost and quality at least equal to South Africa's peers and competitors. The NIP 2050, Phase 2, envisages seamless digital enablement of existing and planned infrastructure in a way that lowers cost and improves the quality of service delivery.

How it will be done

- There will be continuous improvement in driving towards universal readiness for a digital world, including the achievement of universal broadband access, digitisation of government services, deepening of information and communications technology (ICT) skills and capabilities, and enablement of e-commerce, digital finance and digital entrepreneurship.
- A public sector broadband and digital services delivery model will effectively engage the private sector, through a growing range of innovative ways of partnering and cooperating.
- There will be sufficient and sustainable public and private finance that enables continuous improvement in delivering universal broadband and supportive ICT services to currently underserved communities and households as well as public institutions.

- Government will have substantial internal professional and technical capability in procuring and overseeing the implementation of universal-broadband delivery and e-government services that operate at a global standard suited to South African conditions and that are continuously improving.
- There will be centres of excellence and think tanks that support private and public sectors to operate inclusively and innovatively to deliver on South Africa's digital imperatives in development.

Crime and corruption

Features of infrastructure safety, security and ethical delivery by 2050

By 2050, South Africa's infrastructure can be planned, procured, built, maintained and used without material risk of crime or corruption.

How it will be done

- There will be demonstrated capacity to successfully identify, arrest and prosecute offenders.
- There will be integrity of internal controls in institutions that own or provide infrastructure to reduce corruption and complicity with criminality.
- Infrastructure will be physically secure and protected from violence, vandalism and theft.
- The value of stolen infrastructure will be reduced, reducing incentives to steal and making it harder to monetise stolen metals, especially copper.

Governance of infrastructure delivery

Features of governance and oversight of infrastructure delivery by 2050

All planning will be efficiently coordinated vertically, across spheres and tiers of government, horizontally between municipalities, and between municipalities, provinces and state entities. Within municipalities planning will be integrated across sectors and activities and will be undertaken with participation of communities and enterprises.

By 2050, there will be confidence in the integrity of government systems and capacity of institutions to deliver the required infrastructure and associated services while ensuring value for money and social accountability. Government will be organised in a way that enables efficient and effective infrastructure delivery. There will be robust technical capability and an ability to mobilise capacity from business and civil society where appropriate.

Monitoring, reporting and evaluation of distributed infrastructure will become regularised, systematised and transparent.

How it will be done

- Planning:
    - Infrastructure planning will be integrated vertically across spheres and tiers of government and horizontally across provinces and municipalities.
    - Planning for infrastructure will be informed by spatial planning priorities and by financial factors.
    - Social accountability and engagement practices in infrastructure planning will be robust.
- Governance
    - The institutional framework and roles of national, provincial, district and municipalities will be clear.

- There will be robust and high-impact capacity-building programmes tailored to specific categories of local government.
- There will be an asset management system for infrastructure throughout the life cycle.
- There will be a high professional and technical standard of capability serving local government infrastructure build and maintenance.
- The procurement system will be robust.
- Conditions for private sector support and partnerships with local government will be optimised.
- The structure and performance of state-owned entities that provide settlement-related services – specifically Eskom, water boards and PRASA – will be strong.

- Monitoring, reporting and evaluation
  - Coordination of infrastructure monitoring, reporting and evaluation (MRE) will be integrated within a government-wide monitoring and evaluation system (GWMES).
  - Systematic planning, budgeting, monitoring, reporting and evaluation reforms for the built environment will be institutionalised.
  - Evaluations will be integrated into the infrastructure planning life cycle.
  - Evaluation capacity will be decentralised, mainstreamed and resourced.
  - Infrastructure information will be publicly accessible and transparent, as well as empower oversight by citizens and communities.

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The National Infrastructure Plan 2050

Phase 2 – Distributed Infrastructure

1 BACKGROUND AND INTRODUCTION: LAYING THE FOUNDATIONS TO ACHIEVE NDP ASPIRATIONS

Infrastructure development is critical to attaining South Africa's long-term economic and social goals. In the context of a developing country seeking significant structural change, the public sector must lead this effort. Infrastructure delivery will be one of the most significant contributors to South Africa's transition from a historically closed minerals economy to one that is globally and regionally integrated, inclusive and host to the dynamic industries of the future.

Public infrastructure investment is central to achieving greater productivity and competitiveness, reducing spatial inequality and supporting the emergence of new job-creating sectors. It is therefore one of the non-negotiable foundations of transformation and inclusive growth. The construction of infrastructure generates employment and broad-based black economic empowerment opportunities, further contributing to the goals of the National Development Plan (NDP).

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Context for the NIP 2050

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- **Public–private cooperation and stimulation of competition**, where appropriate, in the delivery of public infrastructure.
- **Spatial transformation** to promote more inclusive development in line with the National Spatial Development Framework.
- **Blended project finance** and innovative green finance.
- Executive management and technical capability within the state and its entities, so that they are stable and can lead and deliver with confidence.
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- **Environmental sustainability,** including the contribution to achieving net-zero targets.

2 INFRASTRUCTURE SECTORS

2.1 HUMAN SETTLEMENTS

HIGHLIGHTS

Features of human settlements infrastructure by 2050

Affordable housing and infrastructure will be accessible for all South Africans within well-managed, viable and socially and economically integrated communities, located in areas allowing convenient access to economic opportunities and health, education, recreation, and other social amenities.

There will be sustainable provision of a range of affordable housing options, as well as the provision and ongoing maintenance of adequate and accessible urban infrastructure and services to households and other end users in human settlements.

These infrastructure and related services include energy, water and sanitation, solid waste, roads, digital infrastructure as well as passenger transport and social facilities and services that reach end users.

Infrastructure networks and municipal services will underpin sustainable development, assist the overcoming of spatial inequality, and drive economic growth, wealth creation, poverty alleviation and equity.

How it will be done

- Human settlements strategy, policy, planning frameworks and the associated institutional environment and mandates will be clear and aligned.
- Institutional and professional capacity in state institutions, entities, government, and municipalities will be robust.
- Regulatory processes will be efficient and enable delivery required to meet the 2050 vision.
- Municipal funding will be sufficient and sustainable.
- There will be a programme of rapid innovation and change in land, infrastructure, and human settlements delivery.
- Human-settlements-related infrastructure will be climate resilient.

Scope

It is at the neighbourhood and individual housing unit level that infrastructure networks and municipally provided services meet human settlements investments to serve households with basic housing and services. Human-settlements-related infrastructure must provide for existing formally and informally developed human settlement areas and provide sufficient infrastructure capacity ahead of new settlement.

Human-settlements-related infrastructure comprises fixed services (roads, stormwater, and sanitation) as well as functional trading services (water, electricity, and solid waste). In the context of human settlements, the focus is on the connection and provision of critical urban infrastructure and services to business, government, and household users in local areas.

2.1.1 The vision for human settlement infrastructure

Affordable housing and infrastructure will be accessible for all South Africans within well-managed, viable and socially and economically integrated communities, located in areas allowing convenient access to economic opportunities and health, education, recreation, and other social amenities.

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Infrastructure networks and municipal services will underpin sustainable development, assist in overcoming spatial inequality, and drive economic growth, wealth creation, poverty alleviation and equity.

2.1.2 The status of human settlement infrastructure delivery in 2022

Spatial planning and human settlements are concurrent competencies of national and provincial government. Certain functions are also undertaken by state entities such as the Housing Development Agency, the Social Housing Regulatory Authority, the National Housing Finance Corporation (NHFC) and the National Reconstruction and Housing Agency (NURCHA). The plethora of state entities has sometimes raised concerns of overlapping and non-conforming roles, and there are plans to rationalise, realign and capacitate these institutions, including a consolidation of development finance institutions working in human settlements. For example, the National Housing Bank is being established and will bring together the NHFC, NURCHA and Rural Housing Loan Fund. Increasingly, municipalities are required to implement housing programmes in coordination with national and provincial government and state entities.

Housing needs in South Africa are significant and growing. It is estimated that the number of households will more than double by 2050, with an increasing proportion of households being concentrated in urban areas, including major cities and secondary towns. Housing development contributes significantly to South Africa's GDP, particularly in respect of upstream manufacturing and services growth as well as creating wealth for households. However, it is clear that the development of housing and human settlements could drive far more economic stimulation than at present.

Housing supply is generally sufficient to meet demand for middle-to-upper-income households, but increasingly insufficient to meet the needs of lower-income households. Housing supply in South Africa has been through mainly the following delivery systems:

- Formal private sector development serving households earning more than R22 000 per month, through ownership and rental.
- Government-subsidised housing (fully or partially developed) for ownership and rental, serving households earning less than R22 000 per month.
- Informal settlements or in 'backyard' small-scale rental units constructed on existing residential properties, which arises where there is insufficient supply of subsidised accommodation to low-income households.

Publicly funded human settlement developments are generally financed through Human Settlements Development Grants in non-metropolitan municipalities and through the Urban Services Development Grant allocations in the metros. There has been an emphasis on 'mega-projects' and on informal-settlement upgrading but these have not delivered the outcomes envisaged. More recently, there has been a shift away from the delivery of fully subsidised housing units towards the provision of serviced sites, increasing the role and responsibility of households themselves, together with the private sector, in the development and improvement of housing.

The Department of Human Settlements Land Assembly Strategy (2021) proposes a realignment of housing delivery towards the following:

- **Greenfield development** – private and public sector (subsidised) greenfield projects and site and service or rapid land release projects.
- **Brownfield development** – efficient redevelopment or conversion of existing land or buildings for high-, middle-, and low-income housing.
- **Residential densification** – expediting densification of targeted existing residential areas through small-scale affordable (backyard) rental for high-, middle-, and low-income households and affordable-housing delivery.
- **Informal settlement upgrading** – enhancements to the existing programme to improve the recognition and categorisation, in situ service installation and provision of tenure in informal settlements.

This increased emphasis on the provision of basic infrastructure by government creates an important opportunity for infrastructure investments to shape future human settlement development.

Key challenges related to the delivery of new human settlements include the following:

- Policy complexity and uncertainty, a multifaceted public institutional landscape and complex intergovernmental relationships, which make effective coordination of human settlement development challenging.
- Limited appropriately qualified and experienced officials in local government that constrains the ability to plan, implement, provide services, monitor, repair and maintain, and manage human settlements.
- Fraud and corruption that diverts developmental resources away from delivery.
- Fiscal appropriations for new human settlements that are decreasing over time, while costs per unit of accommodation serviced are rising annually.
- Weak implementation of spatial plans that perpetuates the creation of dysfunctional human settlements that are peripherally located, mostly in the form of low-density settlements, and developed without the necessary preplanning requirements for township establishment and the requisite infrastructure and services that allow them to be functional and sustainable.
- A land tenure and property registration system that does not cater sufficiently for less formal tenure systems, and many households being unable to obtain title to their properties.
- Government's subsidy programme, which does not respond adequately to the diverse housing needs of low- and middle-income households, which results in limited and generally uniform housing development with a limited range of typologies and tenure types.
- A general lack of community and civil society involvement in the design and implementation of human settlements.
- The rapid deterioration of existing urban infrastructure networks and service provision.

The management, maintenance, upgrading and replacement of municipal infrastructure lags far behind requirements, with much legacy urban infrastructure having exceeded its productive life and in many instances no longer functioning adequately. The financial basis from which municipalities should be maintaining and improving service provision is highly inefficient, including accurately billing and effectively collecting property taxes and rates for trading services and levying and collecting relevant development contributions that assist with infrastructure provision but do not disincentivise development.

Consequently, services are becoming both more inefficient and less effective, with high levels of non-revenue water and electricity output, and increasing threats to public health as a result of poor sanitation and solid waste services.

The breakdown of key national infrastructure networks places a heavy burden on urban residents. These include the breakdown of the national electricity infrastructure and the poor state of national rail infrastructure, which hampers the creation of sustainable and equitable urban settlements.

2.1.3 Conditions required to achieve the 2050 vision for human-settlements-related infrastructure

Six conditions must be met to achieve effective implementation of a new urban agenda in respect of human settlements and infrastructure:

1 **Human settlements strategy, policy, planning frameworks and the associated institutional environment mandates must be clear and aligned:**

- There must be a cohesive human settlements strategy and synchronisation of the institutional and policy environment around human settlement planning, municipal services provision, and housing development.
- State entities and development finance institutions in the human settlements sector must work in alignment and with strong capacity.
- The planning frameworks that guide urban infrastructure planning and land use management must be aligned and synchronised. Public and private investments must be focused on required shifts in urban form and housing typologies that improve spatial integration, densification, and infill development.

2 **Institutional and professional capacity in provincial institutions, entities, government, and municipalities must be robust:**

- Key professional capacities to develop and manage human settlements within provincial government, metropolitan and local governments must be strong, and there must be greater planning and efficiencies in managing, maintaining and replacing existing urban services.
- Infrastructure engineering skills within provincial governments and municipalities must be sufficient to support a growing need for them, due to the shifting focus in human settlements provision away from top-structure provision towards serviced sites, in situ upgrading and densification and the anticipated increase in demand for housing opportunities. This includes serviced sites, in situ upgrading and densification processes.

3 **Regulatory processes must be efficient and enable delivery required to meet the 2050 vision:**

- Human settlements infrastructure delivery functions must be devolved to cities where possible.
- Infrastructure and human settlements delivery approaches must deliver basic land and access to services at a much greater pace and scale. This must pre-empt the informal settlement of land and expedite the upgrading of informal settlements if South Africa is to meet the burgeoning demand for urban land and services.
- Planning, procurement and delivery management of infrastructure and human settlements projects must be oriented to optimise outcomes from existing resources and minimise time and resource wastage. There must be a greater focus on brownfield development, residential densification and informal settlement upgrading.
- Development approval processes including rezonings, building plan approvals and development contribution requirements must be simplified and made more relevant to the reality of less formal development processes. Approval processes must be fast-

tracked to limit development delays and encourage movement of private capital into human settlement development.

4 **Funding must be sufficient and sustainable:**

- Long-term funding for housing related infrastructure must be coordinated and provide for both new and existing developments. Existing statutory financing instruments for human settlement and infrastructure must focus on providing relevant infrastructure capacity ahead of development to guide future desired development outcomes.
- Critical attention must be paid to accurately levying and efficiently collecting revenue from property taxes and municipal services revenue to support long-term maintenance and reinvestment in infrastructure networks and service provision. Breaking the cycle of non-payment for services is an essential element of future infrastructure sustainability. Dedicated funding for bulk infrastructure must be considered, particularly in areas where there is high demand for human settlement development.
- There must be a significant shift in expenditure from primary infrastructure provision to maintenance and extension of existing infrastructure networks. In this way existing infrastructure investments will be protected and expanded to service increasing urban density.

5 **There must be a programme of rapid innovation and change** in land, infrastructure, and human settlements delivery. Approaches to more rapid development, expedited in situ upgrading processes and approaches to supporting increased urban densities must be developed and be mainstreamed. Improved efficiency in infrastructure delivery, service provision and maintenance at city, neighbourhood and site level must be pursued, approved, and implemented.

6 **Human-settlements-related infrastructure must be climate resilient:** Climate change targets in the built environment (beyond SANS10400 XA) must be incorporated into infrastructure and human settlement plans and must consider life cycle costing and the environmental impact of human settlements to ensure the built environment contributes more to South Africa's net-zero carbon targets. The design and implementation of all infrastructure investments must incorporate climate resilience considerations, contribute to mitigation and adaptation as appropriate, and access climate finance where practical. Design standards must be reviewed and amended to support climate resilience.

2.1.4 How the 2050 vision for human settlements will be achieved

Strategic element	2050 vision – How it will be done
Human settlements strategy, policy, planning frameworks and the associated institutional environment and mandates are clear and aligned.	• A strategic framework for human settlements (white paper) providing a new unified approach for the sector will be developed and implemented. • Planning, budgeting, and implementation frameworks will be strengthened. Unified approaches to land use planning, human settlements planning and promulgation, infrastructure planning and cross-cutting funding will be developed and implemented. Lessons from pilot cases will feed into longer-term institutionalised approaches.
Institutional and professional capacity in state institutions, entities, government, and	• A clear strategy and implementation plan for the rationalisation and alignment of the current human settlements state entity capacity will be approved within three years. Institutional refocusing and realignment will begin in this period, to create streamlined and purposeful interventions.

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Strategic element	2050 vision – How it will be done
municipalities are robust.	• In line with the District Development Model (DDM), the C2 Districts that have a service provider role will be capacitated to coordinate and support urban infrastructure needs through clear mandates and sufficient funding to ensure district infrastructure capacity supports human settlements development ahead of demand. • Leadership, governance, and accountability will be strengthened. A clear and agreed plan for re-capacitation and re-professionalisation of infrastructure development, engineering service provision and human settlement delivery departments in district municipalities, cities and local municipalities will be developed and implemented consistently.
Regulatory processes are efficient and enabling of delivery required to meet the 2050 vision	• Appropriate devolution of human settlements and related infrastructure provision powers, functions and funding will be expedited to support decision-making close to the point of implementation. • A programme of urgent and direct action at provincial and municipal level will be implemented to drive out and punish corruption and unauthorised expenditure. • Streamlined planning, building control and bylaw enforcement processes at municipal level will drive rapid development approvals to support private sector investment in the built environment. • National legislation with respect to development charges will be implemented by municipalities.
Municipal Funding is sufficient and sustainable.	• A national programme of municipal rates and taxes collection improvement will drive municipal sustainability and will be linked to conditional grants to cities and municipalities. • At national, provincial and city level, closer links will be forged between multiple infrastructure and human settlements funding streams. This will be piloted in the short term and ensure continued implementation across the NIP 2050 timeline. • A clear statutory funding framework that provides adequate resources and shifts infrastructure spend to supporting adequate maintenance, re-commissioning and upgrading the capacity of existing networks to protect existing assets and drive densification will be implemented.
There is a programme of rapid innovation and change.	National support for innovation and expansion of research, learning and practical approaches to implementation of human settlements initiatives will be expanded. This includes initiatives driven by supporting entities such as the Cities Support Programme and targeted research by Science Councils.
Human-settlements-related infrastructure are climate resilient.	A coherent approach to mainstreaming the built environment contribution to meeting South Africa's climate targets will be developed and implemented. This will include retrospective resource efficiency programmes and proactive approaches to more appropriate future development. • Design standards and processes will be amended to support climate resilience. • Climate resilience will be incorporated into infrastructure design and implementation. • Climate finance will be accessed to support investments in climate resilience.
Three-year actions	Human settlements strategy, policy, and institutions: • A human settlements and municipal infrastructure strategy white paper will be developed and approved by 2023/4.

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Strategic element	2050 vision – How it will be done
	• The development, integration and implementation of municipal land assembly schedules, human settlement plans and municipal bulk and link infrastructure plans will be driven more forcefully. Municipalities will develop schedules specifying land that has been assembled for human settlement development and a clear pipeline of human settlement developments to be undertaken. This will be integrated and implemented with municipal bulk and link infrastructure plans. Institutional capacitation: • A plan to rationalise and realign human-settlements-related infrastructure institutions and development finance will be developed and approved by 2023/4. • A programme for provincial and municipal human-settlements-related infrastructure engineering re-capacitation and re-professionalisation will be designed, approved and budgeted by for by 2023/4, with implementation starting in 2024. • C2 district municipalities with service delivery mandates will be capacitated to support DDM. Enabling regulatory framework: • A programme to eliminate corruption and unauthorised expenditure will be implemented from 2023. • Expedited planning, building control and development contribution regulations will be developed and implemented by 2023/4. Sustainable municipal funding: • A programme to strengthen the levying and collection of municipal rates and taxes levying and collection will be implemented from 2023/4. • Expedited statutory funding streams for new human settlements focus areas will be implemented, including rapid serviced land release, in situ informal settlement upgrading and urban densification, and to ensure that infrastructure provision (particularly bulk and link) is timeous and supports human settlement development. • An infrastructure reinvestment, maintenance, and capacity expansion programme will be developed. An infrastructure programme will be put in place to maintain infrastructure in existing residential areas and will expand capacity so that densities in specified existing areas can be increased and new residential areas can be developed. Innovation and change: • There will be increased resourcing and sharing of testing and innovation programmes focused on rapid land release, in situ informal settlement upgrading, densification and urban service delivery methodologies. • A pilot programme will be designed and implemented to test critical typologies and methodologies in pilot cities with central government support: City of Cape Town and City of Ekurhuleni (urban densification) and City of Ekurhuleni and City of Tshwane (in situ upgrading). Built environment climate targets: • A plan to achieve a built environment net-zero development will be developed by 2023/4. • SANS 10400XA revisions will be completed and implemented.
SIPs	• **SIP 6:** Integrated municipal infrastructure project aims to further develop infrastructure and capacity to assist the 23 districts with the fewest resources (19 million people) to address all maintenance backlogs and upgrades in water, electricity, and sanitation bulk

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Strategic element	2050 vision – How it will be done
	infrastructure as well as road maintenance. The road maintenance programme will also be enhanced. SIP 6 will be enhanced to promote densification where possible with review of the funding framework where needed for dedicated funding for bulk infrastructure development. • **SIP 7:** Integrated urban space and public transport programme aims to better coordinate planning and implementation of public transport, human settlement, economic and social infrastructure and location decisions in respect of sustainable urban settlements connected by densified transport corridors. This will focus on the 12 largest urban centres of the country. SIP 7 will be enhanced to better integrate residential areas occupied predominantly by low income households into the urban fabric so as to create access to employment and urban amenity. The cost of the transport networks provided will be a key consideration. Such areas include former townships, mega projects and new areas designated for the rapid release of land programme.

2.2 MUNICIPAL TRADING SERVICES: ELECTRICITY, WATER AND SANITATION, AND SOLID WASTE

HIGHLIGHTS

Features of trading services infrastructure by 2050

Municipal electricity, water and sanitation, and solid waste services will be delivered to enable universal access with sufficient, reliable, and affordable services, supporting an inclusive economy and thriving households. These services will be efficiently managed and will be financially and environmentally sustainable.

How it will be done

- The institutional framework and governance arrangements will be fit for purpose.
- Management will be effective, supported by adequate technical capability.
- Trading services will be financially sustainable.
- The private sector will participate effectively.
- Policy and regulatory frameworks will be supportive – in respect of price setting as well as procurement and contracting, with stronger enforcement of legislated standards and the enablement of step-in options as required to ensure service delivery.

Specific to sectors:

- Operating licences will be used as a key instrument for structural reform of the municipal electricity distribution business.
- In municipal water delivery, a diversity of delivery models will be implemented, with a differentiated approach between cities, towns and rural districts.
- Competition and new delivery models will be introduced into waste collection.

Scope

Municipal electricity, water and sanitation (wastewater), and solid waste are collectively called municipal trading services. Responsibility for providing these services is constitutionally assigned to municipalities. Trading services account for approximately half of the total operating revenue for all municipalities and share the following key features:

- These services are funded primarily through user charges (tariffs), within an intergovernmental grant framework designed to support the provision of basic services to poor people as set out in the Division of Revenue Act. National government provides about R40 billion in grants each year for water and sanitation for this purpose, compared to revenues of R80 billion.
- Income and expenditure must be accounted for separately for each of these services in terms of municipal budget circulars and related regulations as issued under the Municipal Finance Management Act (MFMA), 56 of 2003.
- Tariffs for these services must reflect the costs of rendering the service, as required by the Municipal Systems Act, No 32 of 2000, including operating, maintenance and capital costs, including the costs of rehabilitating and replacing costs assets.

2.2.1 The 2050 vision for municipal electricity, water and sanitation, and solid waste

Municipal electricity will be delivered to enable universal access to sufficient, reliable, and affordable electricity services, supporting an inclusive economy and thriving households. Municipal electricity will be efficiently managed, and will be financially and environmentally sustainable.

Municipal water and sanitation services will be delivered to enable universal, affordable and reliable access to water and sanitation of an acceptable quality and quantity, supporting an

inclusive economy and a healthy living environment. Wastewater will be treated to the required standard. Water and sanitation services will be efficiently managed, and will be financially and environmentally sustainable.

Solid waste services will be delivered to enable universal access to adequate levels of waste collection and municipal areas will be free of litter. Separating-at-source and recycling programmes will divert waste from landfills sites for reuse or recovery, aligned with up-to-date integrated waste management plans. Waste disposal sites will comply with permits and there will be sufficient airspace available to meet waste disposal needs. Waste services will be financially sustainable, based on full-cost accounting and cost-reflective tariffs, and waste-contaminated land will be sufficiently and timeously remediated.

2.2.2 Status of municipal electricity, water and sanitation, and solid waste in 2022

Very significant improvements in access to trading services were achieved after 1994 through intensive programmes to roll about basic services in municipalities, supported by national government grants (and Eskom in the case of electricity). For example, over 7,5 million households were provided with electricity. However, ongoing progress to achieve universal access has slowed in recent years and there has been a significant decline in the reliability and quality of services provided.

In the case of electricity, the reliability of the distribution network is a serious concern in many municipalities, including major metropolitan areas, secondary cities, towns and rural areas. Uncertainty about the future institutional structure of the electricity distribution industry contributed to significant under-expenditure on maintenance and renewal of assets, with the backlog in asset rehabilitation estimated to be growing at R2,5 billion per year, with a total backlog of more than R32 billion.

Reliability of water supply is also a serious concern, with many municipalities unable to provide a continuous water service. The loss of a continuous pressurised system results in repeated pressure shocks, faster system deterioration, and high losses. Wastewater systems are also in a poor state of repair, with two out of every five systems (334 out of 850) in a critical state and nearly two out of every three in a poor (or worse) state. These challenges are experienced across almost all municipalities – metros, secondary cities, small towns and in rural areas.

More than half of municipal landfills are not compliant with regulated standards, and waste collection is not reliable in many municipalities, leading to waste accumulation and health hazards.

The poor reliability of services affects many households directly, increasing health risks and reducing quality of life. Poor services also increase the cost of business and reduce investment and economic growth, causing job losses and increased poverty.

Water, wastewater (sanitation) and electricity services are infrastructure intensive, that is they require high levels of capital expenditure on infrastructure relative to the revenue received from these services. Their performance is therefore heavily influenced by the extent to which assets are maintained and rehabilitated. Budgeted capital expenditure on trading services was R33 billion (2021/2); however, actual expenditure was substantially lower than this, pointing to capacity and process constraints. Efficiency of capital expenditure is a significant issue. Patronage, vandalism and ‘construction mafia’ activities increase project costs. The overall level of investment is too low and loan finance is an underutilised resource.

The very large majority of municipal water and electricity services are highly inefficient, with high technical and commercial losses, and low cash collections. This substantially increases the cost of the service. Municipalities also face reducing revenues as a result of customers moving off-grid as alternatives become more cost-competitive and/or for reasons of securing a more reliable service. This makes the provision of a reliable and efficient service all the more important.

Municipalities have struggled to collect all the revenue that is due to them from customers. As at the end of 2021, customers owed municipalities R232 billion, representing over 12 months of revenue from these services. More than three-quarters of this debt is over 90 days old and difficult to collect. Municipalities owed their creditors R76 billion, which was R30 billion more than customers owed them (counting only customer debt less than 90 days old). The debt situation is becoming more serious each successive year. For example, municipal debt owed to Eskom increased by 250% from 2017 to 2021, with R35 billion in arrears at the end of 2021.

At the same time as customer debt has been increasing, municipalities have budgeted for an overall surplus for trading services (R20 billion in 2021/2). While trading services assets have deteriorated, municipalities have allocated resources from the trading services to support other services.

There are approximately 133 municipalities that distribute electricity and 144 municipalities responsible for the provision of water and sanitation services (out of the 257 municipalities in total). All 205 local municipalities and the eight metro municipalities undertake waste collection services. Eskom plays a significant role in distributing electricity. Water boards provide bulk water to six of the eight metros and some other municipalities, and in a few cases also support municipalities in the provision of water and sanitation services.

Weak governance, together with inadequate management and technical capability, are important contributing factors to poor performance outcomes. Low economies of scale constrain performance in the case of municipalities serving small towns. Many municipalities struggle to attract and retain skilled staff, particularly in rural areas. Financial viability of services is a critical constraint in rural areas, as well as in areas of economic decline.

Internationally, direct municipal provision of electricity and water services (as technical departments within a municipality) is the exception rather than the norm. These services are normally run as publicly owned businesses, within a corporate company structure with an independent board. While it is technically possible to operate these services within a municipal bureaucracy, there are often serious shortfalls, including the following:

- Diffuse accountability for the key business outcomes.
- Weak incentives to run the business effectively and efficiently.
- Weak links between revenue and expenditure.
- Little flexibility in how many is spent and limited incentives to innovate and optimise.

Creating conditions for institutional effectiveness is key to better outcomes. More funding will have the required impact only if delivery institutions are running more efficiently and effectively.

Past efforts by national government to intervene in and/or support the more effective provision of trading services by municipalities have not been effective. For example, a 10-year, multibillion-rand effort to achieve a redesign of the electricity distribution sector failed in the absence of a change in the allocation of constitutional powers and functions. New thinking is required.

2.2.3 Conditions required to achieve the 2050 vision for municipal trading services

There are five conditions required to ensure that municipal trading services deliver on South Africa's 2050 vision:

1 **The institutional framework and governance arrangements must be fit for purpose**. Trading services must be set up to run as if they are businesses (business units or company structure), with full transparency on financial and technical performance, with sufficient economics of scale, with a suitable long-term perspective for planning and investments, and with stable management and professional, independent oversight.

2 **Management must be effective, supported by adequate technical capability**. Professional engineering skills must be in place for these infrastructure-intensive businesses. Management must have day-to-day autonomy to run the business with accountability for performance.

3 **Trading services must be financially sustainable** and support adequate levels of infrastructure investment. Revenue, and the funding and finance framework, must be sufficient for required investments in maintenance, rehabilitation and expansion. Infrastructure investments must be linked to these revenue streams, whether funded by loans or user pay.

4 **The private sector must be enabled to effectively participate** through partnerships and alliances, contributing skills and finance, as well as bringing improved efficiencies.

5 **Policy and regulatory frameworks must be supportive**, including procurement processes that lead to timely value-for-money outcomes, contracting processes that support timely and cost-effective private participation, and economic regulation and pricing processes that support the financial viability of these services.

The goal is to achieve effective, efficient, reliable and sustainable services with sound governance, professional management, and revenue and financial sufficiency. In some cases, municipalities may be able to achieve these goals substantively on their own, within the prevailing policy, regulatory and funding framework. However, in many cases, municipalities may need to contract out services to the private sector, or restructure the service, to achieve these goals.

2.2.4 How the 2050 vision for municipal electricity, water and waste infrastructure will be achieved

Strategic element	2050 vision – How it will be done
The institutional framework and governance arrangements will be fit for purpose.	Constitutional responsibility for electricity distribution, water and sanitation, and solid waste collection will stay with local government and there will therefore be no large-scale and across-the-board institutional reforms (that is, a country-wide redesign of the institutional structure for the municipal waste, water and electricity sectors). Reforms to institutional structure at a municipal level will be on a case-by-case basis and will be achieved through a combination of incentives and regulatory interventions. These will be driven by the imperative to improve effectiveness and efficiency in the management of trading services and to increase the level sustainable investment. There will be an emphasis on managing trading services as businesses within company structures or as business units, with sound governance and effective management, and achievement of economies of scale through aggregation where appropriate. (See details for specific sectors below.)
Management will be effective, supported by adequate technical capability.	Significant emphasis will be placed on the need for professional management and minimum competency requirements will be introduced. Processes for delivering trading services will be professionalised, in respect of planning, project preparation, procurement, contracting and contract management, with support provided through standard templates, contracts and similar mechanisms. Supply chain management legislation and processes will be reformed with a focus on transparency, accountability and value for money, reducing red tape with less onerous and time-consuming processes and moving away from a tickbox approach to compliance. Financial transparency will be improved, and separate financial statements will be required to be published for each of the trading services at a municipal level.

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Strategic element	2050 vision – How it will be done
Trading services will be financially sustainable.	The grant framework will be reformed with a view to: • creating strong links between capital funding, maintenance, management and performance of trading services, with investments requiring a 'maintenance plan'; • introducing stronger incentives to improve performance; and • creating strong incentives to ensure grants are used more effectively and efficiently.
The private sector will participate effectively.	A professional public–private partnership (PPP) support unit with the necessary capabilities will be dedicated to the implementation of municipal PPPs with a focus on four priority use cases: build-operate-transfer (BOT) contracts for desalination, reuse and wastewater treatment; and municipal renewable-energy projects. Management contracts will be used to create and manage purpose-built companies as part of voluntary or incentivised opt-in to professionally managed, soundly governed and economically regulated municipal-owned companies. Franchising options for management of trading services or aspects of the service will be explored. Centres of excellence will be established for planning, project preparation, financing, procurement, contracting, contract and project management, and innovation.
Policy and regulatory frameworks will be supportive.	Professional capacity in economic regulatory entities will be developed or strengthened, with dedicated, skilled professional that have strong capability to undertake high-quality analysis, and support market reforms. They will implement incentives for capital and operating cost efficiencies linked to pricing mechanisms that support public policy objectives. They will promote transparency through excellent reporting on technical and financial performance. The legislative framework will be reformed to facilitate private sector participation through streamlined processes enabling PPPs to be implemented without delays and with more emphasis on transparency and value for money and less on controls.

There are strategic elements that are specific to each sector:

Strategic element	2050 vision – How it will be done
Municipal electricity	**Operating licences will be used as a key instrument for structural reform of the municipal electricity distribution business** • The conditions for an electricity distributor to obtain (and retain) an operating licence will be clarified, with material consequences (such as loss of a licence) should conditions not be met. If a municipality loses its licence to operate the electricity distribution network, it will then need to contract with a licensed operator. • Licence conditions will include strong financial transparency and technical performance reporting requirements. The above process will result in a consolidation of the electricity distribution business over time, through the creation of dedicated electricity distribution companies serving multiple municipalities. The process will be accelerated through the use of financial incentives linking access to financing for infrastructure upgrades with performance.
Municipal electricity – three-year actions	• A dedicated professional team will be created within the National Energy Regulator of South Africa to drive performance improvements and reforms of the municipal electricity business through implementing an effective licensing regime.

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Strategic element	2050 vision – How it will be done
	• Financial and technical transparency and reporting requirements will be strengthened in 2023 and implemented in 2023/4. • The operating-licence instrument will be strengthened in 2023 and implemented in 2023/4, with the first cases of retraction and transfer of operating licence from municipalities in 2023/4. • Five electricity distribution companies will be established by 2025 and performing with acceptable standards of financial performance, reliability and asset management systems, as well as appropriate levels of investment. • A financing instrument linking access to finance for rehabilitation of electricity distribution assets with improvements in the financial and technical performance of the electricity distribution business will be designed in 2023 and implemented in 2023/4.
Municipal water	**A diversity of direct municipal delivery models will be explored and implemented, with a differentiated approach between cities, towns and rural districts.** **Cities** operate at sufficient scale to be able to attract the necessary management and technical skills, and water business should be financially viable within the prevailing grant framework. Financial incentives will be introduced to support the professionalisation of the service through the creation of dedicated, soundly governed water companies or business units, with ring-fenced revenue and a single point of accountability for performance. **Towns:** Municipal water businesses could perform adequately within well-governed municipalities, but may find it difficult to attract and retain the necessary professional skills. Economies of scale will be achieved either in a 'one-to-many' professional support offering to these municipalities or through voluntary incentivised aggregation into municipal-owned, professionally managed and soundly governed water companies. **Rural areas**: • Service provision in rural areas will remain grant dependent. • In rural areas with large regional piped water systems, management capability will be strengthened, including enforcement of payment for water use beyond a basic amount. Mechanisms will be implemented to attract and retain the necessary management skills for large piped systems. Where appropriate there will be aggregation across rural districts to attract the necessary management skills, through management contracts. • For small local systems, mechanisms to promote more involvement and ownership by communities, with suitable regional support structures, will be explored.
Municipal water – three-year actions	**A greater diversity of options to improve water and sanitation services will be employed:** In cities: • Services will be professionalised through creation of a dedicated governance protected company structure in three cities. • Management contracts will be employed in three cities. In towns: • A private sector support model serving multiple towns will be implemented. • One municipal-owned regional company will be established spanning three or more municipalities. In rural areas:

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Strategic element	2050 vision – How it will be done
	• A management contract for two or more districts will be implemented. • An appropriate support model to support community-owned local schemes will be established.
Solid waste – three year actions	In cities: • Waste collection businesses will be exposed to competition with the private sector through implementation of five-year contracts, with effective support for procurement, contracting and contract management in place. • All landfill sites in the metros and secondary cities will have a valid permit and be regulated and managed effectively, with functional and operating weighbridges. • Arrangements for waste diversion and recycling will be scaled up. In towns and rural areas**:** • A 'one-to-many' professional support offering will be made available to these municipalities with a view to improving waste collection efficiencies and effectiveness, the financial sustainability of the collection service, and the management of landfills to comply with regulated standards. • A 'cleanest town' award programme that includes an audit of waste management for all municipalities (modelled on the Green Drop process) as part of (or separate from) the Greenest Municipality Competition will be reintroduced.
SIPs	**SIP 10: electricity transmission and distribution for all** SIP 10 will be augmented to include an institutional performance dimension. Capability to manage the distribution business effectively (technically and commercially) will be put in place. This will be achieved through incentives (linking funding for renewal of distribution infrastructure with performance improvements) and/or through regulatory mechanisms (forcing municipalities to outsource capacity where they fail to meet minimum conditions of their operating licence), as set out in this document. **SIP 18: water and sanitation backlogs and water reliability** SIP 18 will be augmented to include an explicit institutional performance dimension, to ensure financial viability and effective management of water and sanitation businesses in South Africa's metros, secondary cities and other economically important towns, to support socioeconomic development. This will be achieved through incentives (linking funding for renewal of water infrastructure with performance improvements) and/or through regulatory mechanisms (forcing municipalities to outsource capacity where they fail to meet minimum standards), as set out in this document. SIP 18 will be augmented to reach informal settlements. **SIP 6: assist the 23 districts with the fewest resources to address all the maintenance backlogs and upgrades required in water, electricity and sanitation bulk infrastructure.** SIP 6 will be augmented to include an explicit institutional performance dimension, linking provision of funds for improvements in technical and financial performance improvements. See comments on SIPs 10 and 18.

2.3 PASSENGER TRANSPORT

HIGHLIGHTS

Features of passenger transport infrastructure by 2050

By 2050, the passenger transport sector will facilitate efficient and affordable access by all South Africans to economic opportunities, social interaction and services. Passengers' needs for reliability, dignity, security, safety and health while travelling will be met, with environmental sustainability promoted.

How it will be done

- Integrated planning will be robust and leverage coordinated action.
- Funding allocation and funding sources will be sustainable and aligned with strategic goals.
- Modes of transport will be integrated and well aligned with passenger needs.
- Transport will be made safe and secure for all users.
- Passenger transport will contribute to South Africa's environmental objectives.
- State capacity to plan, implement, regulate, enforce and monitor public transport sector projects will be robust.
- The passenger transport sector will be agile and adaptable to changing transport realities.

Scope

The NIP 2050 concentrates on land passenger transport modes involving the majority of people, namely road and rail – whether train, bus, private taxi, minibus taxi, cycling or walking – in urban and rural contexts and for near- or long-distance travel.

2.3.1 The vision for passenger transport

By 2050, the passenger transport sector will facilitate efficient and affordable access by all South Africans to economic opportunities, social interaction and services. **Passengers' needs** for reliability, dignity, security, safety and health while travelling will be met, with environmental sustainability promoted.

2.3.2 Status of passenger transport in 2022

Passenger transport is the joint responsibility of all three spheres of government, with the majority of implementation taking place at local level. There has been a directional policy shift in spending towards public transport and non-motorised transport, supported by new frameworks for planning, regulation, and private sector involvement. However, the desired results in terms of scale or scope have not been realised.

Significant expenditure has been directed to commuter rail focused on PRASA, as well as operating subsidies directed to bus services and to the Gautrain (2010–2020). However, the dominance of minibus taxis and private cars has grown. The majority of public sector spending accrues to less than 10% of public transport passengers.

There are trade-offs and choices between modes of travel, which in many cases should be connected through intermodal links, including commuter rail, light rail, bus, minibus, private cars and non-motorised (walking, biking) travel.

The trends in usage of urban passenger transport modes over the period from 2003 to 2020 reveals the following:

- Public transport shares decreased, while private low-capacity modes (cars, taxis) grew over the past two decades, leading to greater traffic congestion. There has been a significant decline in the use of passenger rail since 2013 despite significant capital expenditure and operating subsidies.

- Minibus taxis now account for 80% of public transport trips. The number of households who used a taxi rose from 9,8 million (2013) to 11,4 million (2020).
- Substantial numbers of people, including scholars, do not use motorised transport and walk all the way to school or work.

In many urban areas, commuter transport expenditure has risen faster than inflation and travel times have increased, in step with rising congestion on roads and poor rail performance.

There have been some successes. Rea Vaya and MyCiTi offer examples of enhanced bus systems; research in Soweto shows that on average Rea Vaya users saved 13 minutes per one-way trip to work at the same destination (this is a 10–20% saving). They save 2% in fare on average since Rea Vaya is not priced much lower than the minibus taxi.

The challenges in making the desired modal shifts in urban areas are related to a complex set of factors. These include failures in governance and management of PRASA, which has led to the collapse of passenger rail, especially in a context of State Capture; a lack of integration of transport modes that would see minibus taxis, buses, and rail articulating effectively; challenges in project management; policy uncertainty; institutional weakness; and weak regulation. This has prevented the emergence of a sufficient infrastructure project pipeline. There has been poor policy alignment, with significant emphasis on Bus Rapid Transit (BRT) rather than on strengthening networks overall. There has been more focus on citywide mobility, and less done to improve mobility within localities: this priority is partly explained by the predominance of national funding rather than funding from municipal rates. The technical capacity within the state has weakened and is insufficient for the complex work of reforming and building integrated transport systems. Spatial planning and land use towards densification have not proceeded as intended and as implemented have run counter to the goal of integrated affordable and accessible public transport.

The dynamics of rural and long-distance passenger transport differ from the urban context. The quality of roads varies considerably by region, with special concerns related to the maintenance of gravel roads (see section 2.4 below). There are specific concerns in respect of long-distance travel, specifically funding for related bus services, road safety on intercity routes, infrastructure for pedestrians and passenger travel over border crossings.

While more spending on passenger transport infrastructure is needed, these institutional challenges explain for the most part the slow progress as well as the poor capital raising and funding.

There are a number of emerging challenges, most notably the following:

- **Climate change, extreme weather, and impacts on infrastructure resilience** – These effects that will require more attention to be paid towards modal shifts away from cars, towards the conversion of public sector fleet vehicles to cleaner fuels, and towards reducing travel demand and distances through land use change. There might be opportunities related to climate-related finance that might help to fast-track new investments.
- **Technological change** – The adoption of alternative fuels in passenger transport is growing rapidly internationally. This presents opportunities such as the adoption of electric vehicles (EVs) in bus and minibus taxi fleets, as well as challenges such as with regard to the timely rollout of EV charging facilities and adoption of suitable standards to ensure interoperability. Some initial research has shown conversion of municipal bus and minibus taxi fleets to alternative fuels such as compressed natural gas or electric to be financially viable and environmentally attractive, but also that cities need help with centralised procurement, regulations, and infrastructure to reduce risk to manageable levels. Over the longer term, changes in vehicle technology such as with autonomous vehicles will require adaptation to infrastructure in both transport and communications, operations (eg traffic

signals), enforcement, regulations, and funding models. The trajectory of adoption is highly uncertain at this stage.

- **New market models** – Mobility innovations like e-hailing and shared small vehicles (eg tuk-tuk services) challenge existing operators, planners and regulators, who are not able to respond quickly enough to changing market conditions or technologies; new regulations have not yet been promulgated. This leads to conflict and foregone benefits for users and cities.

2.3.3 Conditions required to achieve the 2050 vision for passenger transport

The transformation of passenger transport into one that is affordable and accessible will require significant shifts in funding and institutional alignments. This will involve a reorientation of passenger transport from a fragmented, mode-based system to an integrated, coordinated network of infrastructure and services.

Seven conditions must be met to achieve the 2050 vision for passenger transport:

1 Integrated planning must be robust and leverage coordinated action.

- Land use and transport planning must be integrated:
  - Municipal mechanisms must enable implementation of various integration objectives to develop public transport supportive land use, eg SPLUMA, IUDF, NDP.
  - There must be coordination between various departments and spheres involved in spatial development and transport, eg Human Settlements (national and provincial), Cooperative Governance and Traditional Affairs (COGTA), SOEs.
  - The responsibility must be devolved to the lowest level of government.
- There must be integration across adjacent areas with common transport catchments:
  - Mechanisms for cooperative planning across jurisdictions must be robust.
  - Suitable higher-level planning authorities must be in place, such as the Gauteng Transport Authority, and have sufficient planning capacity and competency.
  - Modes with long development timelines and high capital investment needs, such as rail, must form part of national strategic planning to create certainty.
- There must be integration across modes into networks:
  - Public transport investments must build towards a well-integrated multimodal network.
  - Existing investments must be leveraged, and integrated rapid public transport networks (IRPTNs) must be expanded to achieve economies of scale and maximise systemwide patronage.
  - A wider range of interventions must be consistent with demand potential and conditions, eg range of vehicle sizes, priority infrastructure and enhanced operations.
  - There must be more focus on first- or last-mile access, including the quality and safety of walking and the local street environment.

2 Funding allocation and funding sources must be aligned with strategic goals and must be sustainable.

- The subsidy regime for passenger transport must be reformed to become a more user-targeted, equitable, predictable, and sustainable fiscal instrument that is better aligned with the vision for passenger transport in the medium-to-long term. Key needs are:
  - to provide clarity on state support for the minibus taxi sector;

- to link the subsidisation of bus, IPTN, and rail modes to the achievement of measurable efficiency and effectiveness targets; and
- to improve the flexibility of the funding regime to enable planning authorities to be more agile in response to changing needs, and to make trade-offs in the funding between modes, and between housing and transport development, in order to achieve a better system-level outcome.

- Uncertainties regarding the envisaged role of private sector investors must be clarified. Their participation in passenger rail, IPTN operating contracts, and toll roads is an important example, bearing in mind the lessons learnt from recent projects like Gautrain's PPP and Gauteng's e-tolls. There must be policy clarity about the role of user charges in financing transport infrastructure, to reduce risk to all parties involved.
- New funding sources for transport that are effective, fair, and sustainable need to be cultivated, especially at the local government level. Potential options might include climate-related finance and real estate value capture.

3 Modes of transport must be well aligned with passenger needs.

- The minibus taxi industry must be upgraded and integrated into the wider passenger transport system. There must be a **common action plan** between operators, government, and private sector players (e.g., vehicle manufacturers, finance institutions, technology providers). This must take into account the wide range of opportunities for improvement, including in infrastructure, the vehicle value chain, passenger services, and 'green' technologies such as EV fleets. Taxi upgrading must take place in the context of wider public transport upgrade projects. Regulatory processes must be robust, such as in the processing of operating licence applications at provincial regulatory entities (PREs).
- Investment in rail must be strategic and sustainable.
- Transport infrastructure for rural and long-distance travel must be fit for purpose.

4 Transport must be safe and secure for all users.

5 Passenger transport must contribute to South Africa's environmental objectives.

6 State capacity to plan, implement, regulate, enforce and monitor public transport sector projects must be robust:

- The responsibility for delivering public transport must be devolved to the lowest appropriate level of government, and appropriate capacity and funding must be in place and institutions must be strengthened and accountable.
- The regulation of public transport modes must be streamlined.
- There must be proactive promotion of technological innovation.
- There must be effective data collection and monitoring of public transport infrastructure.

7 The passenger transport sector must be agile and adaptable to changing transport realities.

- Transport must grasp innovative technological change.
- Digital data must be leveraged for continuous improvement in delivery and operations.

2.3.4 How the 2050 vision for passenger transport will be achieved

Strategic element	2050 vision – How it will be done
Integrated planning is robust and leverages coordinated action.	**An integration strategy, assessment of integration barriers and needs that affect transport planning and implementation across the whole of government will be evaluated every five years**, with the first being completed by 2023/4. An integration strategy will be formulated to identify opportunities for reform and alignment of institutions, mechanisms, and regulations. This includes integration of land use and transport planning, intergovernmental coordination, and alignment of transport functions across state entities with overlapping mandates. **Transport and housing policies will be aligned by planning authorities**, for instance by linking rail reinvestment with low-income housing development along development corridors and in peripheral areas.
Funding allocation and funding sources are aligned with strategic goals and sustainable.	**The subsidy policy for passenger transport will be oriented towards overall passenger transport goals and will rely on fiscal instruments that ensure delivery and financial sustainability.** Key features will be the following: ● Clarity on state support for the minibus taxi sector. ● Support for effective decentralisation of transport functions to lower levels of government, and ensuring sustainable and predictable funding to leverage both state and private sector investment in passenger transport. ● A subsidy that is linked to the achievement of measurable efficiency and effectiveness targets and institutional reform. ● Sufficient funding secured so there is certainty for investments with long-term payback periods such as rail infrastructure. ● Sufficiently flexibility so as to enable planning authorities to respond more quickly to changing needs and to make trade-offs in the funding between modes, and between housing and transport development, to achieve a better system-level outcome. **Funding sources will become more diverse:** ● Private sector participation in passenger transport will be stimulated, including both operations and infrastructure investment. ● Suitable models will be developed for expanding PPPs in passenger rail and IPTN investment, involving land development partners and other stakeholders. PRASA will leverage land development around stations more effectively as an additional funding source.
Modes of transport are integrated and well aligned with passenger needs.	**Public transport investments will be sufficient and balanced for building towards an optimal multimodal network:** ● **Authorities will plan and implement IPTNs in 10 cities,** forming a sensible network of reliable and high-frequency routes that is accessible to 85% of the population; that comprises BRT, bus, rail and minibus taxis (as relevant); that is differentiated by city or town size and needs; and that prioritises integration between modes. The Department of Transport (DoT) will provide improved support (eg centralised procurement). ● Authorities will accelerate their investment in dedicated road space (lanes, intersection priority) and passenger facilities for public transport to achieve specific targets for stabilising travel times,

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Strategic element	2050 vision – How it will be done
	expanding patronage, and improving efficiency for operators. This might serve BRT, 'quality bus', and/or minibus or midibus routes, according to the local network plan and in line with revised ('downscaled') standards for BRT prepared by DoT. ● Planning authorities will develop precinct plans and implementation capacity to improve mobility and access within neighbourhoods. ● **The minibus taxi industry will be empowered and transformed to contribute optimally to the attainment of the transport vision.** ● The role of the minibus taxi in the multimodal network will be clarified, including areas where it operates as primary mode or is complementary to other modes, taking both industry business sustainability and transport system needs into account. A variety of vehicle sizes will be used. Authorities will be able to implement this vision in cooperation with the industry. ● Opportunities will be pursued for the wider empowerment of current stakeholders in the minibus taxi industry, allowing them to transition towards operating stable, innovative, and sustainable businesses that grow jobs. Government and other industry partners (like vehicle finance) will support industry transition through professionalisation, effective regulatory functions and conflict resolution, infrastructure provision, and financial support or incentives in line with a new subsidy policy and local transport plans. **Investment in rail will be strategic and sustainable:** ● A short-to-medium term reinvestment strategy for commuter rail (PRASA) will be developed and costed to guide reconstruction of infrastructure, focusing on priority corridors where the investment is justified by demand conditions in the context of the multimodal network plan, and in consultation with local authorities. Some rail services might be taken over by road-based services where appropriate. ● The subsidy regime for PRASA will be reformed to link funding to the achievement of clear performance targets, and to keep fares at affordable levels. ● The national rail master plan will be updated and costed to create greater certainty about long-term (re)development of passenger rail (PRASA and high-speed rail), to deliver an actionable project pipeline. The timing of actual investment will be determined by demand and fiscal conditions. First priorities will be Gauteng (including Gautrain), Cape Town, and eThekwini, with other areas following. Approaches towards partnerships with private sector players (including property developers) will be clarified. **Transport infrastructure for rural and long-distance travel will be fit for purpose:** ● The condition of national roads will be sustained, while a renewed strategy is developed to improve maintenance and the upgrading of provincial and municipal roads. This might require improving the Provincial Road Maintenance Grant conditions; expanding technical support and oversight from SANRAL; addressing procurement bottlenecks; better coordination (eg with the Department of Public Works and Infrastructure's rural bridges programme); and expanding DoT's efforts to improve data collection, performance monitoring, and rational asset management in underperforming provincial and rural municipalities.

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Strategic element	2050 vision – How it will be done
	• Infrastructure at critical border crossings will be expanded to accommodate growing traffic volumes, and transit times will be reduced through improved efficiency and management at border posts. • Basic accessibility in rural areas will be enhanced through the development of a model to provide a guaranteed minimum daily frequency of bus or minibus taxi services on selected rural routes.
Transport is safe and secure for all users.	• The national road safety strategy and its implementation will ensure that an ongoing programme for identifying and rectifying unsafe road conditions and practices is implemented. • **The reform of the Road Accident Fund will be completed** to ensure sustainability and equitable social support for the victims of road accidents. • **Strong state policing** will secure the country's rail and road assets, in partnership with local stakeholders.
Passenger transport contributes to South Africa's environmental objectives.	• There will be strong intergovernmental coordination on initiatives to implement green transport, promote green hydrogen and other alternative energy sources, improve energy efficiency, and promote local vehicle manufacturing to ensure that synergies are maximised. • Transport policy will become forward-looking with regard to identifying environmental risks associated with climate change and developing guidance for all role-players on how to improve climate-related adaptation and resilience of passenger transport infrastructure. • A national approach towards the deployment of electric vehicles will guide investments in charging infrastructure to ensure compatibility and optimal growth.
State capacity to plan, implement, regulate, enforce and monitor public transport sector projects is robust.	**State capacity to effectively coordinate and regulate will be strong:** • Regulation of passenger transport modes will be integrated and streamlined, starting with the Single Transport Economic Regulator (STER) and improvement of the PREs. • The logjam regarding implementation of tendered contracts for the subsidised bus industry will be resolved, and contracts will be integrated into broader IPTN-linked subsidised service contracts administered at devolved authority level. **Passenger transport will be devolved to lower levels of government:** • Transport planning, implementation, and management will be devolved to municipal level or, where needed, some regional entity, where suitable capacity exists, and in accordance with the need for local accountability and better coordination. • Local institutions for executing this function will be strengthened through incremental capacity building of technical and managerial skills and suitable institutional design.

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Strategic element	2050 vision – How it will be done
The passenger transport sector is agile and adaptable to changing transport realities.	• Opportunities for research and development on new transport technologies and smart cities will be created and funded. These will be guided by a strategic national research agenda for passenger transport of the future, which will be continually updated to reflect changing knowledge. • Opportunities for promoting local content and manufacturing of new transport technologies (e.g., bicycles, vehicles, infrastructure) will be identified and actioned together with other government entities. • New market models and technologies will promote a passenger transport sector that is responsive and flexible to encourage innovation. **Digital data will be leveraged to enable continuous improvement:** • The DoT will develop a guideline for the collection and management of data and information from the mobility industry to ensure it is available for the benefit of government, operators and users. Mechanisms will be put in place to address data integrity and privacy concerns. • A suitable entity will be identified and entrusted with the responsibility for collecting, analysing, and curating data on transport infrastructure to provide a high-level or strategic view of the state of infrastructure and to identify progress or problems timeously.
Three-year actions	• A review of integration barriers and needs affecting transport will be completed by 2023/4. • An action plan for the minibus taxi sector will be jointly developed to guide the formalisation, regulation and empowerment of the taxi industry) including a vision for its role in the IPTN), state support and actions, defined timelines, empowerment initiatives, and the commitments made by the industry by 2023/4. • IPTN patronage will be doubled. New all-day services will be extended and/or opened in all 13 metros, including a combination of dedicated trunk, priority off-trunk routes, and/or well-integrated feeders, using a variety of modes. This will be completed by 2024/5. • Two small cities and two rural districts will showcase improved IPTN systems including upgraded infrastructure for bus and/or taxi and operations. These pilots will be designed and funded in 2023/4 and begin implementation by 2024/5. • A short- or medium-term turnaround and reinvestment strategy for commuter rail (Metrorail) will be developed, costed, consulted on in 2023/4. It will be implemented to achieve radical improvement in operational and general management from 2024/5. • An effective model for policing and protecting railway assets will be developed by March 2023 and implemented from April 2023. • A revised public transport subsidy and funding policy will be finalised and adopted by June 2023. Fiscal instruments and grant conditions will shift in response from mid-2023. • A new contract for the operation of the Gautrain beyond 2026 will be put in place by 2024, while expansion plans are coordinated and a national rail master plan is developed.

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Strategic element	2050 vision – How it will be done
	• A prototype system for a national integrated electronic ticketing system will be piloted in one city in 2024 and 2025, and later expanded to cover all public transport operations nationwide. • The STER will be finalised and established in 2022/3. • The impasse around the e-toll system in Gauteng will be resolved and the future role of user charging in financing transport infrastructure will be clarified by DoT and NT. • The Beitbridge and Komatipoort border post upgrades will be completed in 2022/3. • A strategic research agenda for future transport will be published in 2023 to guide research on smart and green transport for the next 10 years.
Top-priority SIPs	• Road upgrades and maintenance will be prioritised to support critical passenger transport routes, adding economic value in key regional SIPs: SIP 3 (N2–Wild Coast Highway), SIP 4 (North West), SIP 5 (Saldanha–Northern Cape development corridor). • **SIP 4 and SIP 5:** SIP 4 and/or 5 will be expanded to pilot a rural transport development model. SIP 4 unlocks economic opportunities in North West, while SIP 5 focuses on the Saldanha–Northern Cape development corridor. • **SIP 6 –** integrated municipal infrastructure project: DoT, with assistance from SANRAL, will assist poor-performing rural districts with road maintenance programme to enhance service delivery capacity. • **SIP 7 –** integrated urban space and public transport programme: There will be enhanced coordinated planning and implementation of public transport, human settlement, economic and social infrastructure and location decisions in respect of sustainable urban settlements connected by densified transport corridors. There will be focus on a few underperforming cities plus large towns in line with DoT's differentiated approach. • SIP 8 – green energy in support of the South African economy: Green transport, including electric vehicles, hydrogen and other fuels, will be aligned with broader green-energy actions across government (e.g. green transport helps to create a demand for green energy). • SIP 17 – regional integration for African cooperation and development: Mutually beneficial infrastructure investment with neighbouring countries will be promoted as stated in NIP Phase 1, including cross-border roads and border crossings.

2.4 ROAD INFRASTRUCTURE

HIGHLIGHTS

Features of road infrastructure by 2050

South Africa's road network will support the movement of people and goods in an efficient, affordable, safe and environmentally sustainable manner. By 2050, there will be less reliance on roads, greater domestic and regional integration of intermodal transport, and a more balanced use of rail and air freight.

How it will be done

- Road transport planning will be integrated, providing seamless, affordable inter-modal options.
- Road networks maintenance and build will be financially sustainable.
- State capacity to oversee the road network will be robust and effective.
- There will be strong state capability to work with the private sector.
- There will be strong capacity to deploy technology and innovation.

Scope

South Africa has an extensive network of about 158 000 km of paved roads and almost 460 000 gravel roads. The road network is managed by provinces, municipalities, metros, as well as a state entity, SANRAL.

2.4.1 The 2050 vision for South African roads

South Africa's road network will support the movement of people and goods in an efficient, affordable, safe and environmentally sustainable manner. By 2050, there will be less reliance on roads, greater domestic and regional integration of intermodal transport, and a more balanced use of rail and air freight.

2.4.2 Status of South African roads in 2022

A growing proportion of freight and passengers are transported over road; by 2021, about 79% of freight and 91% of passengers were transported by road instead of rail. While the South African road network is currently the backbone of South African transport systems, it is not the most affordable, or the safest or the most carbon-efficient mode. Intended shifts from road to rail have not materialised.

There are 750 000 km of road in South Africa, managed by provinces, local municipalities, metros and SANRAL. South Africa is seen to have a sufficient road network; however, there are concerns in respect of sustainable maintenance and asset management.

Unproclaimed roads, situated predominantly in rural areas, are roads that have not been formally recorded in the road inventories. Therefore, no tier of government is officially responsible for their upkeep.

There is growing road congestion, and road assets are being depleting prematurely. In 2021, about 79% of the 868 million tonnes of freight and bulk was transported by road and only 21% by rail. Similarly, 91% of the 230 million passengers travelled by road and only 9% by rail. This increased risk to the safety of the roads, and poor quality of roads was a direct result of the collapse of PRASA and the slow response by Transnet to increase the capacity and effective maintenance on the various rail lines.

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Table 1: Management of roads in South Africa

STRUCTURES		PAVED KM	GRAVEL KM	TOTAL	% SPLIT
Provinces	9	46 509	226 273	**272 782**	44%
District municipalities*	44	37 680	219 223	**256 903**	42%
Metros	8	51 682	14 461	**66 143**	11%
SANRAL	1	19 301		**19 301**	3%
Sum: Non Toll	**62**	**155 172**	**459 957**	**615 129**	
SANAL Toll		2 952		**2 952**	0%
	62	**158 124**	**459 957**	**618 081**	
Unproclaimed			131 919	131 919	
	62		**591 876**	**750 000**	
* Transport Authorities					

Source: SANRAL 2020-2025 Strategic Plan

Road network planning is fragmented: There are 62 structures in South Africa responsible for road infrastructure across the three spheres of government: national toll roads and non-toll roads are managed by SANRAL, provincial roads by the nine provinces and municipal roads by the 44 district municipalities as transport authorities. Reporting, tracking and monitoring are inconsistent and/or not available. Standards vary, skills and asset management systems are inconsistent, and efficiency of spend differs.

Provincial road oversight is characterised by the following:

- **Rural isolation** – Provinces are responsible for **44%** of the road network, which includes 226 373 km of gravel roads. These are of the poorest quality and continue to isolate rural parts of the country. This raises the cost of access and trade for the poorest communities, isolating them even further.
- **Ineffective spending** – Provinces spend most of their annual allocation, which rose by 4% annually between 2015/16 to 2021/2. Yet, the condition of many provincial roads is poor. Although monitoring and reporting have improved, more could be done to facilitate standardisation (of materials, designs, labour, methods, minimum standards), effective spend and the safety on roads. Spending on national and provincial roads has grown at the same rate, suggesting that different outcomes are not specifically due to funding shortfalls, but potentially more due to effectiveness in their use.
- Poor planning and inadequate maintenance
    - Road deterioration will occur over time due to normal traffic and environmental factors. However, the rate of deterioration will drastically increase by factors such as overloading, extended rainy periods, and poor or inappropriate pavement maintenance. Road pavement performance will improve through scheduled and routine maintenance actions such as crack sealing, patching (not pothole filling) and resurfacing or overlaying through timeous preventative maintenance actions. Once the terminal level on the visual condition index (measures the condition of roads) has been reached, rehabilitation of the road or even reconstruction will be required. It has been shown over many years that delaying appropriate preventative maintenance by one year increases the cost of improvement by a factor of eight.
    - More than **80%** of provincial roads are gravel. Only 1% is re-gravelled each year, meaning that a road will be re-gravelled once in 100 years.
- **Lack of skills and technology** – Most of the provincial roads are not adequately maintained due to inappropriate spending, lack of competence and capacity, limited ability

to manage infrastructure, corruption, and lack of due professional care and oversight. Provinces cannot invest in the same technical systems, technology, competencies and skills as SANRAL.

- **New operating models emerging** – The Eastern Cape, Limpopo and North West have entered into memorandums of understanding (MoUs) with SANRAL to maintain some of their paved roads, to leverage SANRAL's technical skills, supply chain knowledge and necessary capacity to oversee the contracts to maintain these roads effectively.

Table 2: Expenditure on national and provincial roads (2013/14–2019/20)

KEY NATIONAL SUBSIDIES (R billion)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
National roads (excl toll network) – capital	7.04	8.18	8.59	9.33	11.11	12.50	13.18
National roads current	3.56	4.01	4.45	4.79	5.05	5.35	5.67
Expenditure by SANRAL on tolled roads network*	2.99	4.02	4.33	4.75	n/a	n/a	n/a
Provincial roads maintenance	7.52	7.96	8.22	9.38	10.00	11.33	12.18
TOTALS	21.11	24.17	25.59	28.25	-	-	-

Source: Urban Transport Analysis for the Urbanisation Review, Philip van Ryneveld, January 2018

Table 3: Condition of paved and gravel provincial roads, 2017

Condition of paved provincial roads - 2017						
	Very Good	Good	Fair	Poor	Very Poor	
Length (km)	8 272	10 914	13 995	10 132	5 629	48 942
% of Network	17%	22%	29%	21%	12%	100%
					32%	
Condition of gravel provincial roads - 2017						
	Very Good	Good	Fair	Poor	Very Poor	
Length (km)	1 886	93 311	34 993	56 737	37 394	224 321
% of Network	1%	42%	16%	25%	17%	100%
					42%	

Source: Data extracts and recalculations Road Review 2018 by PA Myburgh

Municipalities and metros road oversight is characterised by the following:

- Municipalities and metros are responsible for 52% of the road network. This includes 219 223 km of gravel roads.
- **Weak governance, technical capacity and financial systems** – According to the Auditor-General more than **84%** of the 257 municipalities received **qualified audits**. They lack technical engineering competence, have weak governance and poor financial systems, as well as mismanage assets.
- **Borrowing authority** – Municipalities, in terms of the MFMA, are able to raise funding; however, they often lack the technical competence and capacity to raise funding and procure and oversee a road infrastructure maintenance programme.
- **Disconnected rural towns** – These towns remain disconnected from trade hubs and the mainstream economy, which perpetuates unequal access to services and opportunities and results in **ongoing poverty, social discord and inequality**.

- **Inadequate maintenance of roads in urban and rural areas** – These roads are not maintained adequately due to underspending, inappropriate spending, lack of competence, and limited capacity to manage with due professional care.
- **Ineffective stormwater drainage and flood management systems** – Due to poor drainage modelling and a poor risk management approach, roads in cities and towns cannot manage floods and storms, resulting in severe damage costs and insurance payouts, which is expensive.
- **Collapse of PRASA** – According to Stats SA the number of rail commuters dropped from 175 million passengers in 2019 to just over 20 million passengers by 2021. Some of these passengers are now commuting by road. This highlights the importance of maintaining roads in and around urban centres to ensure safe and accessible transport, albeit more expensive with a higher carbon footprint.
- **Poor monitoring, reporting and fragmentation** – No data or indices are maintained to track the performance of municipal road maintenance or to assess the condition of roads.

SANRAL's oversight of roads is characterised by the following:

- SANRAL manages 3% of the road network, which carries 34% of vehicle kilometres driven in South Africa. Like other state-owned entities, SANRAL is mandated to find a balance between its core business and delivering on government's development mandate. SANRAL has invested and deploy world-class systems, technology and asset management programmes but their capital build programme has been challenged, with uncertainty regarding the Gauteng Freeway Improvement Project (GFIP) and the recent changes in their procurement and adjudication of tenders.
- **Uncertainty and lack of confidence:** SANRAL has a simple and effective business model, yet has been hamstrung due to uncertainty in respect of user-pay toll roads, especially in the **GFIP**. This has been exacerbated over the past six years **by the absence of a decision from the state on how to move forward**. Taxpayers are cross-subsidising 90% of the users of the GFIP roads who are unwilling to pay for the services, resulting in reduced maintenance on non-toll roads, reputational damage to SANRAL and a lack of investor confidence. With the ongoing pressure on the fiscus and the state's obligations to support Eskom, investors have expressed concerns about government's ability to continue supporting SANRAL.
- **Procurement efficiency or interference** – To build, operate and manage roads, SANRAL needs management and a board that is competent and experienced and includes road engineers. The position of CEO has been vacant since November 2021 and the position of Chief Business Operating Officer needs to be filled. The board, with the support of the shareholder, recently cancelled R17,5 billion worth of tenders, causing significant concern and reputational damage to SANRAL. DBSA, which has limited specialised road- or bridge-building technical capability, has been deployed to adjudicate their highly complicated and complex tenders, without the expert inputs from the consulting and design engineers.
- Opportunity to support road management, oversight and technology deployment for other spheres of government:
    - Some capacity shortfalls could potentially be addressed by widening SANRAL's mandate and making more use of its road and asset management systems, competence and technology, and ability to do 100% routine maintenance on its roads annually. SANRAL has a track, trace, monitoring and clearing systems that can support a single 'token' for passengers using intermodal networks, dispatch real-time rapid-response units to accidents, and strengthen safety and security on roads.
    - SANRAL has had experience in asset management transfers of provincial roads; however, this was done without the commensurate budget to cover the full life cycle

cost. It is projected that the increase in roads under management to 35 000 km would reduce the budget per km from R1,2 million to R0,6 million per km. This would increase the overall condition index (measures the condition of roads) from less than 10% to over 35%, resulting in an overall deterioration of the roads. If SANRAL's mandate were to expand, its budget would need to be commensurate with added responsibilities.

The financial sustainability of South African roads is characterised by the following:

- **Borrowing authority** – Designing and building roads and bridges are a complex and expensive undertaking, especially as the flow of traffic usually cannot be halted while building. These programmes take between three and five years to implement. SANRAL, metros and municipalities are able to raise funding in terms of the PFMA and MFMA respectively.
- **SANRAL financial uncertainties** – In 2021 SANRAL tapped into its 2035 bond at fairly tight spreads, through private placements. However, SANRAL faces uncertainties about the role of private finance in developing roads, resulting in further tender delays or cancellations. If SANRAL relies on tax-based funding only, projects may not proceed due to budget constraints and other competing needs. The Auditor-General has pointed to uncertainty regarding SANRAL's financial sustainability. Some of SANRAL's financial uncertainty arises as a result of toll roads as well as insufficient budget transfers where SANRAL has taken over provincial road management.
- **Weak credit and reputation risk** – Most municipalities are insolvent. Municipalities are often unable to package projects for submission to development finance institutions or the Infrastructure Fund, since they often lack the necessary technical competence and governance to implement, operate and maintain infrastructure.
- **Lack of skills and systems** – To date, concerns about unsustainability arise from weak capacity (fit-for-purpose technical competence and capacity, technology, governance, systems, and know-how) in municipalities and provinces to build, operate and maintain roads. It means that it is not sustainable or efficient in the long term for municipalities and provinces to build, operate and maintain roads.
- Safety and security
    - **Poor road safety, especially for pedestrians** – It is not safe for women and children to travel long distances by road. Most roads are not supported by roadside assistance. According to figures from the RTMC, fatalities decreased by almost half between 2010 and 2019. Nevertheless, road fatalities in South Africa remain unacceptably high, especially since pedestrians account for 40% of the deaths.
    - **Bridges** – In rural areas the indigent population, especially children and women, cannot get access to schools, clinics and services due to the poor state of gravel roads or no river crossings (walkways or bridges).
    - **Construction mafias, cable or metal theft, and unrest** – Contractor and construction workers' lives are threatened due to community unrest, labour disputes and/or construction mafias. Construction sites are vandalised and destroyed.
    - **Looting and vandalism** – After the recent floods, SANRAL and Transnet reported significant damage to toll booths and rail lines due to vandalism.

2.4.3 Conditions required to achieve the 2050 vision for road infrastructure

There are five conditions that must be met to ensure the road network delivers on South Africa's 2050 vision:

1 **Transport planning must be integrated and aligned across transport modes**. This will drive the following:

- Efficient planning of road maintenances in urban and rural areas.
- The ambition to integrate modes and shift freight and passenger transport from road to rail where appropriate.
- Efficient regional logistics, to enable manufactured exports.

2 **Road networks maintenance and build must be financially sustainable.**

3 **State capacity to oversee the road network must be robust** – including with respect to leadership, governance, accountability and technical capacity. The state must have strong regulatory capability overseeing the entire transport sector. STER must be established and function effectively and in a way that contributes to the overall transport vision.

4 **There must be strong state capability to work with the private sector and form partnerships, alliances and contracting**.

5 **There must be strong capacity to deploy technology and innovation in support of seamless intermodal transport, efficient road maintenance and repair, and road safety.**

2.4.4 How the 2050 vision for road infrastructure will be achieved

Strategic Element	2050 vision – How it will be done
Transport planning is integrated.	• Transport planning will be integrated and will include air, road and rail. • The ambition to shift freight and passenger traffic from road to rail where appropriate will be achieved. • Rural road networks and critical rural bridges will be built and maintained. • A road master plan will be developed, published and implemented. • Regional road logistics will be supportive of competitive efficiencies for regional goods trade and passenger flows. • Clarity will be given to determine the balance between increasing road maintenance spending to preserve the life or condition of the roads, as compared to accelerating the shift of freight and passenger to rail.
Road networks maintenance and build are financially sustainable.	• There will be resolution in respect of the approach to user-pay in roads, with an early emphasis on GFIP. • There will be a funding platform to accelerate priority road upgrading and maintenance. • There will be long-term certainty created for 'on-budget' road infrastructure. • NT will implement long-term fiscal allocations for the full life cycle of infrastructure that should be appropriated, starting with 10-year windows. This could be applied to secure funds sooner from the ISA for projects that are 'shovel ready' and have the necessary capacity to implement according to specifications. Credibility to implement on time and within budget would be a critical success factor. • Municipal and provincial financial systems for road planning and asset management will be strengthened.
State capacity to oversee the road network is robust.	• Road assets will be managed nationwide according to standards for their full life cycle, including asset management methods. • There will be robust reporting systems to track and monitor financial and non-financial information, data and indicators for all roads. There will be strong road quality monitoring systems. • There will be reconsideration of mandates in road oversight. This will particularly include creating a broader role for SANRAL and for the Municipal Infrastructure Support Agent (MISA). In turn, the capacity and governance of SANRAL and MISA will be strengthened.

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Strategic Element	2050 vision – How it will be done
There is strong state capability to work with the private sector.	• Government will determine and implement approaches to crowding in the private sector as road asset managers and operators where municipal and provincial capacity is demonstrably insufficient to do so. • Provincial roads will be upgraded to support the renewable energy programme.
There is strong capacity to deploy technology and innovation.	• SANRAL's clearing system will be used to support a single, easy-to-use payment and access 'token' for intermodal travel across the country. • SANRAL's road and asset management systems, competence and technology are world-class and will be leveraged for other parts of the road system. • Emerging technologies in the fields of engineering, construction, information and communication will deliver roads more effectively. These will be deployed nationwide. • SANRAL's school of engineering will train and qualify roads engineers to be used across the country to support road maintenance. • SANRAL will work with MISA in training local municipal engineers in asset management systems and emerging technologies in road construction and maintenance.
Three-year actions	• By 2023 the DoT will proclaim who will take responsibility for the 131 919 km of unproclaimed roads, with the commensurate funding allocations to maintain the roads made. • By 2024 the Department of Planning, Monitoring and Evaluation (DPME) will introduce effective consequence management that ensures plans are integrated and that plans are in place to maintain infrastructure assets to appropriate norms. • By 2023 the DoT, Department of Public Enterprises, COGTA, South African Local Government Association (SALGA) and provinces will effectively integrate long-term plans and timelines to move more passengers and freight from road to rail, which undertaking should be better aligned with refurbishments programmes and resonate with the 10-year road master plan. • By 2024 the Department of Defence, DPWI, COGTA and DoT will complete building all critical rural bridges to support access to services and roads. • By 2024 the DoT, Department of Public Enterprises and NT will publish an executable and fundable 10-year road master plan. This must include the following: o Moving at least 50 million tonnes of freight and 100 million passengers from road to rail. o Standard metrics, standardised asset management processes and systems. o Learning from SANRAL, creating and upskilling capacity, and deploying methods and technology. o Quarterly reports and consequence management. o The role of private sector as road asset managers. o Granular plans to revitalise the SIPs relating to roads to develop the necessary corridors. o Promulgation roadmap for the unproclaimed roads. o New funding model to accelerate the maintenance of poor provincial roads. o Programme to pave high-priority gravel roads.

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Strategic Element	2050 vision – How it will be done
	○ Targeted reduction in the carbon footprint. ○ Upgrade of roads to strengthen regional corridors and border crossings. ● By 2022/3 NT and DoT will ensure 100% compliance with the user-pay principle, including deciding on how GFIP will be dealt with. ● By 2023 the DPME, Presidential Infrastructure Coordinating Commission (PICC), DoT and NT, in consultation with SANRAL, will develop a funding platform to accelerate the upgrade, strengthening and maintenance of priority roads by securing and ring-fencing a portion of the transfer and subsidies into roads. This will be coupled with an assessment of using capable entities to implement and deliver according to specifications, including the involvement of the private sector and SANRAL. ● By 2023 NT and COGTA, in consultation with the Auditor-General, will strengthen municipal and provincial financial systems to support infrastructure planning and road asset management. This will follow a conditions assessment of roads and skills audit of capacity to manage the assets. ● By 2023 the DoT will establish the STER to ensure that road assets are managed according to standards for their full life cycle. ● By 2023 the DoT, with the support of the DPME and PICC, will introduce reporting systems to track and monitor financial and non-financial information, data and indicators for all roads. ● By 2023 the DPME (PICC) will prepare integrated monitoring reports on road build to be produced quarterly, with financial and non-financial indicators, including jobs, SMMEs, type of work done per kilometre, locations, construction progress, asset condition, etc. This could include re-establishing the PICC's monitoring and reporting capability and introducing consequence management, including in respect of the cost and impact of all delays to the economy. ● By 2022 the DoT will consider the broader role of SANRAL; fill vacancies in management, including appointing a CEO; and strengthen technical skills on the board. A broader role will require investor confidence and reputation damage to be repaired in the market, this need for repair being a result of the recent slow awarding of tender or cancellation of tenders. This may include an independent assessment of SANRAL's capacity and capability to manage more paved roads. ● By 2024 the DoT, COGTA and DPE will assess the feasibility of a centralised coordination role for MISA to strengthen municipal and provincial road maintenance. This may involve coordination of the qualification of skilled civil road engineers for provinces and municipalities through SANRAL's Technical Excellence Academy. Procurement support will be provided through the Office of the Chief Procurement Officer to facilitate transversal contracts, technology, unblocking, systems and standardisation, as well as implement SANRAL's innovation and standard specifications. ● By 2023 the Department of Public Enterprises, through the Presidential SOE Council, and the DoT will decide on a model that enables private sector road asset management and operations. ● By 2023 metros will implement drainage modelling by applying higher probabilities for flood and storm incidences, including the use of spatial and topographic data for flood routing and hydrological calculations and drainage assessments.

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Strategic Element	2050 vision – How it will be done
	● By 2024 metros and municipalities will perform effective road maintenance and prioritised modelling through the Integrated Infrastructure Asset Management Planning, including the use of the Rural Roads Asset Management Systems.
SIPs	● **SIP 2:** Includes roads forming part of the integrated transport corridor between Durban and Johannesburg. The plans for the N3 De Beers Pass should be unblocked and accelerated. This SIP should be augmented with more effective stormwater draining on and flood management of roads in eThekwini, Pietermaritzburg, Johannesburg and Pretoria, by these relevant metros. ● **SIP 3:** Includes the two SANRAL bridges (Mtentu and Msikaba) and the N2 Wild Coast roads along the corridor between Eastern Cape and KwaZulu-Natal. This SIP should be augmented and integrated with the building of prioritised rural bridges and backlog maintenance on provincial and municipal roads, with a specific programme to address stormwater drainage and flood management in place. ● **SIP 5:** Includes roads from the Northern Cape to Saldanha. ● **SIP 21:** Includes priority roads to be upgraded and strengthened along the key national corridors in the country. The progress on the projects should be prioritised and strengthened, including addressing backlog maintenance. These roads should be reflected in SANRAL's shareholder compact. ● **SIP 25:** Special programmes SIPs include rural and township roads and rural bridges. This SIP should be augmented with the programme to register unproclaimed roads and address their upgrades and maintenance.

2.5 SOCIAL INFRASTRUCTURE: EDUCATION

HIGHLIGHTS

Features of education infrastructure by 2050

Education infrastructure will support the delivery of high-quality, accessible education from early-learning, primary and secondary to tertiary and vocational levels. Education infrastructure will be adaptable and responsive to changing requirements over time, in respect of typology, location and orientation. Facilities will be safe, secure and clean, with water, sanitation, ablutions and security. The built environment and equipment will be conducive to teaching and learning. Affordable transport and broadband will be available to anyone that needs it for access to learning. Buildings will be environmentally sustainable.

How it will be done

- All learners will have access to quality education facilities to ensure globally competitive educational outcomes.
- Existing education infrastructure will be rehabilitated and maintained.
- Education planning capacity will be proactive, robust and responsive.
- Decision-making will be accountable and institutions effective.

Scope

Public infrastructure for education covers the full range of institutions delivering to early childhood and primary school through to community, technical and university levels.

2.5.1 The vision for education infrastructure

Education infrastructure will support the delivery of high-quality accessible education from early-learning, primary and secondary to tertiary and vocational levels, as envisaged in the NDP. Education infrastructure will be adaptable and responsive to changing requirements over time, in respect of typology, location and orientation. Facilities will be safe, secure and clean, with water, sanitation, ablutions and security. The built environment and equipment will be conducive to teaching and learning. Affordable transport and broadband will be available to anyone that needs it for access to learning. Buildings will be environmentally sustainable.

2.5.2 Status of education infrastructure in 2022

The Department of Basic Education (DBE) is responsible for over 22 000 schools providing Grade RR to Grade 12 education. From 2021 the DBE has also been responsible for early-childhood education (0–4) centres. The Department of Higher Education and Training (DHET) is responsible for South Africa's post-school education and training (PSET) sector, which currently comprises 26 public universities; 50 public technical and vocational education and training (TVET) colleges; 9 community education and training (CET) colleges; as well as numerous private higher-education institutions and private colleges. Plans are underway to also transfer agricultural colleges to the PSET portfolio.

2.5.2.1 Status of basic education infrastructure

The Stats SA *Sustainable Development Goals: Country report 2019* shows that overall education facilities have improved since 1994. By 2019, about 95% of children had completed primary school, and 89% had completed compulsory secondary schooling. Infrastructure upgrade programmes and projects focused on the eradication of mud and inappropriate schools; equitable access to schools; increasing the number of special-needs schools, additional Grade R facilities and laboratories; and improved water, sanitation, electricity, and safety facilities at schools. The provincial departments of education (PEDs), supported by the DBE, have shown commitment and progress in improving the physical infrastructure and environment.

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Ring-fenced infrastructure grants introduced in 2001 trebled education infrastructure budgets by 2002. Thereafter, budgets doubled every five years. Expenditure on education infrastructure now exceeds R12 billion per year. The bulk of the funds are transferred to the PEDs under strict conditions governed by the Division of Revenue Act. The accounting officer of each PED is accountable for infrastructure delivery and management. The DBE is accountable for policy, guidance, monitoring and oversight. PEDs plan infrastructure investments to comply with the national norms and standards for schools' infrastructure, based on the total number of learners per school, facility condition assessments, and other data.

The education infrastructure strategy focuses on addressing the following priorities:

- **Priority 1** – Schools built entirely from mud as well as those schools built entirely from materials such as asbestos, metal and wood.
- **Priority 2** – Schools that do not have access to any form of power supply, water supply or sanitation.
- **Priority 3** – Schools with a challenge related to the availability of classrooms, electricity, water sanitation, electronic connectivity and perimeter security.
- **Priority 4** – Schools with a challenge related to libraries and laboratories for science, technology and life sciences.

Some notable interventions include the following:

- Provision by 2017 of electricity at 99% of schools, internet at 20% of schools, computers at 33% of schools, drinking water at 100% of schools and sanitation at 99% of schools.
- The Accelerated Schools Infrastructure Delivery Initiative and the Sanitation Appropriate for Education programmes, which were established to make schools safe and have seen to the demolition and replacement of mud and other inappropriate schools, with 130 new schools constructed; provision of access to water at 489 schools and sanitation at 2 650 existing schools.
- Interventions that have led to 95% of children achieving grade 7, indicating that most children have access to schools.

There are some critical gaps in education infrastructure, including the following:

- **Maintenance** – The budget requirement for preventative maintenance is based on the estimated replacement value of the immovable asset. Typical budget values for annual preventative maintenance are 1% to 2% of the estimated replacement value, depending on the condition of the facility. Facilities in poor condition require an additional 1% to 2% to address the backlog. Assuming a low value of 1% of the estimated replacement value, then R10 billion is required per year for the preventative maintenance across all facilities, with an additional R10 billion for backlog work at facilities in poor condition. Maintenance responsibilities are shared between the school governing body for smaller repairs and maintenance and the PEDs for major works.
- **Access to sufficient water for hand washing and drinking in schools** – An estimated three-quarters of schools struggle to access sustainable or reliable water supply. To cope with drought conditions, many schools have more than one source of water, including boreholes, rainwater, municipal supply and backup municipal water deliveries. In many cases maintenance is inadequate and there is no water supply. Some PEDs procure water maintenance contractors on a three-year term contracts.
- **Access to *usable* sanitation or ablution facilities that are in working order** – About 99% of schools have sanitation infrastructure, but it is often not usable (Human Sciences Research Council, 2021). As South Africa is a water-scarce country, most schools are equipped with dry sanitation, like ventilated improved pit toilets. Some have waterborne sanitation in the administration block draining either to septic tanks or the municipal sewer.

Unimproved pit toilets are being phased out. However, at many schools where new toilets have been provided, the original pit toilets have not yet been demolished, contrary to DBE policy, and are kept locked for drought or emergency use only. In many cases maintenance is inadequate and the toilets are full and not working. Occasionally, PEDs or school governing bodies procure contractors to empty toilets and septic and containment tanks. Often the local sewage treatment works is unable to receive faecal sludge from schools.

- **Overcrowding in schools and multi-grade classrooms –** Overcrowding impacts learning outcomes. Norms and standards require a maximum of 30 to 40 learners per classroom on average. However, classrooms are often overcrowded even where a school meets the norms and standards for the average number of learners per classroom, due to subject choices, class sizes, teacher numbers, or damaged or inappropriate classrooms. Stats SA reports that up to 19% of learners do not attend the nearest school for various reasons. Population movements vary per province, within and between rural and urban areas, and per primary and secondary school catchment. As a result of ongoing demographic changes per catchment, an estimated 37% of schools experience a classroom shortfall.
- **Broadband internet access** – Under the SA Connect Phase 1 public buildings were meant to be fully connected by 2020 but only one-third of schools have internet.
- **Shortage of ECD 0–4 facilities** – The target is to double early-childhood development (ECD) learners by 2030. More facilities are needed. Of the 42 420 early-learning programmes, 86% are based in a formal structure, 60% have a flush toilet, 73% have access to a tap on the premises and 34% don't have access to an outdoor playground with suitable equipment.
- **Full-service schools that allow universal access to neighbourhood schools by learners with disabilities** – There were only 848 full-service schools in 2018, compared with the target of 22 000 neighbourhood schools targeted as full-service schools.
- **Libraries, laboratories, computer centres for quality education** – In 2021 the DBE reported an estimated three-quarters of schools as having no stand-alone library, laboratory or computer centre, and 84% having no internet for teaching or learning. Existing libraries, laboratories and computer centres are often used as classrooms to reduce overcrowding.
- **Learner transport integrated within the passenger transport system** – PEDs are responsible for selecting learners, arranging subsidised learner transport integrated with public transport systems, and prioritising primary school and disabled learners living more than 5 km from school. Due to budgetary constraints, PEDs are unable to transport all needy learners.
- **Schools made entirely or substantially from inappropriate materials and schools with buildings made of inappropriate materials** – In 2021 the Education Facilities Management System (EFMS) reported an estimated 16% of schools as having some buildings made of inappropriate materials and 1% being made entirely from inappropriate materials.

2.5.2.2 Status of infrastructure in higher education and training

Investment in tertiary education facilities have increased steadily since 1994. The DHET established two new universities and the construction of most of the facilities required has been completed. Additional infrastructure budgets were invested at historically disadvantaged universities to deal with inherited disadvantages.

Student enrolment doubled between 2002 and 2012. Yet, many students cannot afford accommodation that would enable them to attend colleges and universities. Learner numbers

are expected to quadruple by 2030 in the 26 universities and 50 public TVET colleges. On the other hand, enrolment at CET colleges currently lags that at TVET colleges, with the audited enrolment figure of only 142 538 students at 2020, meaning the NDP 2030 target of enrolling one million students, given the current infrastructure, will not be met. The growing student population at the TVET colleges and universities as well as the required one million CET student population need to be serviced through infrastructure as well as non-infrastructure solutions such as online education, co-location and multiple intakes.

Nine community colleges target post-school youth and adults who wish to participate in further learning or improve their skills for employability and/or progression to opportunities in the TVET colleges and universities, and 16-year-olds who dropped out before completing grade 9. However, CET colleges are faced with the biggest infrastructure challenge in the PSET sector: they currently own only 4% (72) of the community learning centres and satellite learning centres in which they operate. The remaining 96% (1 719) are at primary and secondary schools under DBE, so there is limited access for CET students as priority must be given to the delivery of the educational programmes of these schools. This is not a conducive environment for the delivery of the CET mandate of providing training in skills programmes, non-formal programmes, and occupational programmes. The Ministerial CET Skills Summit has identified the need to establish 54 CET colleges aligned with the DDM in the 44 district municipalities and the eight metros. No earmarked infrastructure funding has been made available to support CET infrastructure since the establishment of the CET college system in 2015.

The TVET Infrastructure and Efficiency Grant provided since 2018 enables infrastructure repairs and maintenance in priority areas such as bulk services, sanitation, teaching or learning facilities, and student accommodation. The infrastructure budgets are ring-fenced and will treble over the Medium-Term Expenditure Framework (MTEF) period to R0,56 billion in 2024/25.

The university infrastructure and efficiency grant provided since 2016 aims to reduce overcrowding and upgrade poor infrastructure at universities and student accommodation. The infrastructure budgets are ring-fenced and will treble over the MTEF to R2,3 billion in 2024/25.

The infrastructure grants administered by the DHET are transferred to the universities and colleges, with oversight by the DHET Integrated Infrastructure Development Support Programme for PSET. Institutions are responsible for the implementation of the projects and those with capacity challenges are provided with support to build such capacity. The accounting officer of each college and university is accountable for infrastructure delivery and management. The DHET is accountable for policy, guidance, monitoring, oversight.

The focus of tertiary education infrastructure spending is on 1) making colleges and universities safe; 2) maximising the use of existing facilities through efficiency measures, providing equipment, maintenance, and rehabilitation; 3) constructing additional facilities; and 4) implementing non-infrastructure solutions.

There are critical gaps in infrastructure for tertiary education because of the following:

- The demand for student accommodation near colleges and universities has intensified. The estimated shortfall of 511 600 beds negatively impacts students from low-income households, contributing to first-year students dropping out and rendering higher education unaffordable for many students.
- Properly equipped laboratories and workshops for tertiary and vocational training are in short supply. Internet and electricity supplies are unreliable and costly. The number of CET college site-hosting centres, including fully equipped workshops, laboratories and practical spaces for practical training, requires attention. Repairs and maintenance at TVET colleges in priority areas such as bulk services, sanitation, teaching and learning facilities, and student accommodation require attention.

- There is insufficient attention on overcrowding.

2.5.3 Conditions required to achieve the 2050 vision for education infrastructure

1 All learners must have access to quality education facilities supportive of globally competitive education outcomes:

- Classrooms, laboratories, workshops and practical areas must be present, equipped and suited to the required teaching and learning at schools, colleges and universities, and used efficiently. Higher education laboratories, workshops and practical areas must be equipped to enable practical learning
- All education facilities must be safe and secure with reliable, well maintained basic services including water supply, sanitation / ablutions, electricity, broadband internet and security
- Overcrowding must be eliminated through non-infrastructure and infrastructure solutions and the use of classrooms and other facilities must be responsive to demographic changes. Permanent and mobile classrooms must be rapidly deployed to alleviate overcrowding due to demographic changes, or damage to buildings. Under-utilised and unused buildings at education facilities must be converted for ECD, Grade RR / R, or community college use
- Transport must be available for learners living more than 5km from school. Student accommodation must be available for higher education students living more than 50km from home
- Learners with special education needs must have access to suitable education facilities
- Effective use must be made of the non-profit and private sectors to increase institutional capacity to provide, operate and maintain infrastructure.

2 Existing education infrastructure must be rehabilitated and maintained:

- Equipment and higher education laboratories, workshops and practical areas must be in good working order and enable practical learning
- Institutions involved in managing education infrastructure must pay as much attention to the maintenance and rehabilitation of existing infrastructure as to the creation of new infrastructure. Asset management best practices must be implemented, including ring-fencing budgets and monitoring annual emptying of septic tanks and containment tanks, annual repairs to water and electricity systems, and periodic roof maintenance
- Budgets and guidelines must assist education providers with facility maintenance. Budgets and term service contracts must enable upgrades, repairs and maintenance to water, ablution, electricity, security and access facilities
- The existing Education Facility Management System (EFMS) module must be activated to capture data and report on facility maintenance.
- Facilities must be rapidly repaired when damaged by storms, fire or vandalism
- Buildings must be environmentally sustainable and contribute to South Africa’s move to net-zero.

3 Education planning capacity must be proactive, robust and responsive:

- Education facility planning must be proactive, programmatic, well-resourced and used to inform strategy and implementation.
- The existing Education Facility Management System (EFMS) modules must be activated to capture data and report on facility maintenance, and facilitate infrastructure planning in

line with the FIDPM. Data informing planning must be comprehensive and up-to-date. Simpler, cheaper methods must be developed to report on the condition of facilities

- Planning must account for ongoing changes in learner catchment populations, and prioritise non-infrastructure solutions including learner transport, subject offerings, teacher numbers, student accommodation and online education
- Facility planning must be aligned with educator deployment, furniture and equipment provision, learner enrolment and scholar transport.

4 Decision-making must be accountable and institutions effective:

- Institutional accountability, mandates, and roles and responsibilities must be clear for effective decision-making. There must be accountability at each institution for repairs and maintenance of water, ablutions or sanitation, electricity, safety, access and equipment.
- Clear escalation processes must be in place for major repairs, rehabilitation, replacement and upgrading of facilities and equipment at existing institutions
- Decision-making for new facilities, upgrades and additions by the DBE and DHET must be transparent and education providers must be able to provide inputs into the decision-making processes.

2.5.4 How the 2050 vision will be achieved

Strategic element	2050 vision – How it will be done
All learners have access to quality education facilities to ensure globally competitive educational outcomes.	• PEDs and PSET Institutions will assess and review the size, location, condition and usage of facilities and equipment against the norms and standards, align with the curriculum and update the national priority project pipeline. This will be done every five years. • Permanent or mobile classrooms will be deployed rapidly to alleviate overcrowding due to demographic changes or damage to buildings. • PEDs and PSET institutions will budget for and procure contracts to provide classrooms and other facilities in response to demographic changes, to avoid overcrowding, and to equip laboratories and workshops. • A plan will be developed for blended-finance models and private sector participation in education infrastructure programmes and reviewed every five years. • PEDs and the DHET will connect all education facilities to broadband internet provided by others; systems will be in place for learners to access online educational content after hours. Access, reliability and usage will be reviewed annually. • PEDs and PSET institutions will have comprehensive data on underutilised and unused buildings, planning capability and processes that enable ongoing repurposing decisions, and the capacity and regulatory framework that enables them to procure term service providers to rapidly convert them for ECD, Grade RR or R, or community college use. • PEDs will review access to education at full-service schools and special-needs schools by disabled learners, to be done every five years. • PEDs will coordinate with municipalities and DoT in delivering learner transport, focused on ensuring effective universal access to learning. • The DHET will develop the Multifaceted and Comprehensive Strategy for Student Housing, which provides learners from low-income

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Strategic element	2050 vision – How it will be done
	households with affordable student housing, and review the strategy every five years.

Existing education infrastructure is rehabilitated and maintained.	• PEDs and PSET institutions will provide budgets of between 1% and 4% of the replacement asset value per facility for annual facility maintenance to be managed at provincial, district or facility level.
	• Multi-year maintenance plans will be prepared for each facility.
	• PEDs and PSET institutions will procure term service contracts for:
	  ◦ annual maintenance and repairs to water, sanitation, electricity, safety, access, equipment, and annual emptying of septic tanks and containment tanks;
	  ◦ the periodic upgrading of buildings, roofs and equipment, as well as stormwater, water, sanitation, electricity, safety and access infrastructure; and
	  ◦ the rapid rehabilitation of facilities damaged by storms, fire or vandalism.
	• The DWS national sanitation master plan will require municipal waste and wastewater treatment facilities to accept disposal of faecal sludge from schools; disposal will be monitored annually.
	• PEDs, DBE and PSET institutions will monitor maintenance and utility costs per facility.
	• Simpler, cheaper methods will be used to report on the condition of facilities at least every five years.
	• Each facility will have staff responsible for operation and maintenance. PEDs and PSET institutions will update or initiate off-take agreements with youth employment accelerator programmes to provide maintenance assistants reporting to the principal, to be done every three years.

Education planning capacity is proactive, robust and responsive.	• DBE and DHET will review the infrastructure norms and standards every 10 years to ensure equitable, affordable, achievable targets. • The Education Facilities Management System (EFMS) will be the source of data on basic education facilities (ECD 0 to Grade 12). • The DHET will use a central source of data on higher education facilities, for example the EFMS. • The PEDs EFMS planning module will be used to streamline facility portfolio planning, user asset management plans and infrastructure program management plans. • The PEDs EFMS maintenance module will be used to capture data on all maintenance needs and interventions. • The FIDPM will be followed for state funded projects.
Decision-making is accountable and institutions are effective.	• PEDs, DBE and DHET will review responsibility for facility maintenance (including toilet emptying) at provincial, district and/or facility level, this to be done every five years. • PEDs, DBE and PSET institutions will review the escalation processes for major repairs, rehabilitation, replacement and upgrading of facilities and equipment at existing institutions, to be done every five years. • PEDs, DBE and DHET will review the systems that ensure education providers can provide inputs into the decision-making process

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Strategic element	2050 vision – How it will be done
	prioritising the project pipeline for projects funded by the DBE and DHET, to be done every five years. ● Roles and responsibilities for scholar transport provision and budgets between DBE, DoT and municipalities will be clarified. ● PEDs, DBE and DHET accounting officers will procure or recruit additional capacity. ● Performance on these targets will be monitored and reflected in the annual performance plans.
Three-year view	**Equitable access to ECD (0–4):** An ECD infrastructure plan will be developed. Monitoring of private and distributed ECD facilities will be operationalised within the new funding model to double the enrolment. Time frames will be set for completion beyond the MTEF. [DBE] **Equitable access to basic education**: The number of schools that satisfy minimum physical infrastructure norms and standards will be increased by reviewing the infrastructure norms and standards to ensure equity, affordability and achievable targets [DBE]; developing multi-year infrastructure plans aligned with non-infrastructure solutions [PED]; connecting schools to broadband internet; activating the planning and maintenance modules of the EFMS [DBE]; expanding use of the EFMS to ECD [DBE]; developing simpler and cheaper methods of assessing facility condition; improving data credibility [DBE, PED]; procuring or recruiting additional capacity to ramp up infrastructure delivery in line with the grant plans and budget increases [PED]; and implementing partnerships between public and private entities for new infrastructure. **Quality of basic education facilities**: Increase the number of schools that satisfy minimum maintenance standards by allocating staff and adequate budgets per facility, procuring term contracts, developing infrastructure and equipment maintenance plans per facility, implementing planned and unplanned maintenance, controlling utility costs and, using the EFMS: the 1) maintenance plans; 2) expenditure on maintenance of toilets, water, electricity, security, roof, and stormwater systems per learner; 3) expenditure on electricity and water utilities; 4) performance against energy performance certificate requirements; 5) number of sanitation tanks emptied; 6) number of toilets, taps, classrooms, laboratories in use or not in use and number of learners per usable toilet, tap, classroom or laboratory. **Efficient use of basic education facilities**: Develop a plan to balance the use of existing facilities to at least 75% (1 500 hours per year) through: equipping or upgrading to suit needs; releasing underutilised classrooms for CET or ECD at schools with declining learning numbers in the catchment based on planning scenarios; and developing a multi-year plan for non-infrastructure solutions, including providing learner transport, improving access to broadband internet and online learning or teaching opportunities, implementing partnerships with the private sector to de-congest facilities, and employing more teachers for additional shifts at existing schools to reduce learners per classroom. **Basic education health and safety facilities**: Update the DWS national sanitation policy to ensure that the local sewage treatment works accepts faecal sludge from school toilets. [DWS] **Equitable access to CET colleges:** Increase the number of CET facilities that satisfy minimum physical infrastructure norms and standards by: developing a multi-year plan to increase CET infrastructure to quadruple intakes through co-hosting agreements with PED and/or DPW under a memorandum of agreement [DHET]; fully equipping workshops,

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Strategic element	2050 vision – How it will be done
	laboratories and practical spaces for practical training [DHET]; connecting CET campuses to broadband internet, improve connectivity coverage and reduce costs [DHET]; monitoring the number, condition and maintenance of classrooms, workshops, equipment, water, electricity, toilets, and safety at CET centres [DHET]; and implementing partnerships between public and private entities for new infrastructure. **Equitable access to universities and TVET colleges**: Increase the number of facilities that satisfy minimum physical infrastructure norms and standards by: developing norms for differentiated infrastructure and equipment linked to curriculum [DHET]; developing a multi-year infrastructure plan to quadruple enrolment; implementing a facilities management reporting system on capital projects, maintenance, condition and use; implementing infrastructure projects; finalising the student housing strategy and implementing the Student Housing Infrastructure Programme (SHIP) [DHET]; and implementing partnerships between public and private entities for new infrastructure. **Quality of higher education facilities**: Increase the number of universities, TVETs and CETs that satisfy minimum maintenance standards by allocating staff and adequate budgets; developing facility and equipment maintenance plans per facility; implementing planned and unplanned maintenance; controlling utility costs; and monitoring 1) maintenance plans, 2) expenditure on maintenance of equipment, toilets, water, electricity, security, roof, and stormwater systems per learner, 3) expenditure on utilities, 4) performance against energy performance certificate requirements, 5) number of laboratories, classrooms, student beds in use or not in use; and 6) number of learners per usable laboratory, classroom or student bed. **Efficient use of higher education facilities:** Develop a plan to balance the use of existing facilities to at least 75% (1 500 hours per year) by fully equipping workshops and laboratories for practical training, improving access to broadband internet and online learning or teaching opportunities, providing student accommodation, and implementing partnerships with the private sector to de-congest facilities.
Strategic Infrastructure Projects (SIPs)	**SIP 13: National School Build Programme** drives uniformity in planning, procurement, contract management and provision of basic infrastructure services in education. It replaces inappropriate school structures; addresses provision of basic services; and addresses national backlogs in classrooms, libraries, computer labs and admin buildings. Progress has been good. *SIP13 will be augmented with greater focus on maintenance, damaged buildings, overcrowding, laboratories and computer rooms.* **SIP 14: Higher education infrastructure** focuses on lecture rooms, student accommodation, libraries, laboratories, and ICT connectivity; development of university towns with a combination of facilities from residence and retail to recreation and transport; potential for shared infrastructure such as libraries by universities, TVETs and other educational institutions; and two additional new universities. Progress has been adequate. *SIP 14 will be augmented with greater focus on laboratories, workshops, equipment and internet connectivity, supporting a quadrupling of student numbers*. **SIP 15: Expanding access to communication technology** focuses on providing broadband coverage to all households and schools. Progress has been very slow. *SIP 15 will be augmented to ensure that all schools*

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Strategic element	2050 vision – How it will be done
	and colleges have internet access with associated infrastructure and equipment that facilitates teaching and learning. **SIP 34: Student accommodation** focuses on DHET's SHIP to double the student residence beds available to first-year students and NSFAS-qualifying students, providing 300 000 beds at over 300 university and TVET college campuses over 10 years, by blending public and private funding. Progress has been adequate. *SIP 34 will be augmented to ensure that all tertiary students from disadvantaged backgrounds have access to accommodation as required.* **SIP 28: PV and water savings on government buildings programme** focuses on ensuring water and energy security by reducing demand and on efficient use, improved building design and promoting alternative, renewable-energy sources. Progress has been poor. *SIP 28 will be augmented to ensure facilities over 1 000 square metres have energy performance certificates; energy- and water-saving programmes are implemented at schools, colleges and universities; and facilities produce electricity on-site.*

2.6 SOCIAL INFRASTRUCTURE: HEALTH

HIGHLIGHTS

Features of health infrastructure by 2050

Health infrastructure will support the delivery of high-quality accessible healthcare, leading to life expectancy of at least 70 years for men and women, as envisaged in the NDP. Health infrastructure will be flexible, adaptable, resilient and responsive to changing requirements over time. Facilities will be safe, secure and clean, with water, sanitation, electricity and required equipment.

How it will be done

- Everyone will have access to quality health facilities supportive of globally competitive health outcomes.
- All health facilities will operate at acceptable standards suited to equitable quality service delivery.
- Health infrastructure will be financially sustainable.
- Buildings will be more efficient with lower operational costs in the move to net zero.
- There will be robust partnerships and alliances between the state and private actors.
- Existing health infrastructure will be rehabilitated and maintained.
- Health planning capacity will be proactive, robust and responsive.
- Decision-making will be accountable and institutions effective.

Scope

Health infrastructure supports service delivery in communities, primary healthcare facilities and district, regional and specialised hospitals.

2.6.1 The vision for health infrastructure

Health infrastructure will support the delivery of high-quality accessible healthcare, leading to life expectancy of at least 70 years for men and women, as envisaged in the NDP. Health infrastructure will be flexible, adaptable, resilient and responsive to changing requirements over time. Facilities will be safe, secure and clean, with water, sanitation, electricity and required equipment. Buildings will be more efficient with lower operational costs in the move to net zero.

2.6.2 The status of health infrastructure in 2022

The National Department of Health (DoH) is responsible for the regulation of public and private providers of healthcare and support services, and for health policy. Provincial health departments (PHDs) are responsible for delivering all provincial health services, employing staff, running health facilities and managing the provincial health budget.

While over 80% of patients in South Africa are served by the public health service, the private sector attracts 43% of the health expenditure. The South African health system is characterised by a highly resourced private sector and a resource-stressed public system. The pathway to universal access via the National Health Insurance (NHI) is central to South Africa's national health policy vision. NHI is a health financing system designed to pool funds together and pay for healthcare to provide access to quality and affordable personal health services to all South Africans based on their health needs, irrespective of their socioeconomic status. While the majority of general practitioners (GPs) work in the public sector, more specialists work in the private sector. Health system reforms focus on quality health improvement programmes in public health facilities, primary healthcare within communities,

and work sharing between the public and private sectors to achieve more equitable access to improved healthcare.

The integrated referral system includes community-based services, clinical service in health facilities, diagnostic and para-clinical services, medicine supplies and emergency medical services including the following:

- 404 hospitals in the public sector providing 101 862 (69%) beds: district hospitals provide level 1 care with 75 839 beds (45,3%); 66 regional hospitals provide mainly level 2 care in nine general specialities with 6 805 beds (27,0%); and 27 central and tertiary hospitals provide mainly level 3 care with 9 406 beds (27,6%).
- 409 hospitals in the private sector providing 41 297 (31%) beds.
- 3 868 public primary healthcare (PHC) facilities; and private clinics.

The South African population of 60 million (2021) is increasing at 1% per year, and by up to 13% in urban areas in the Western Cape and Gauteng. Approximately a third of the population are youth between 18 and 34 (35%), and a third are between 35 and 65 (32%). While average life expectancy has increased steadily since the publication of the National Strategic Plan 2015–2020 (DoH, 2015), except during the HIV and Covid-19 epidemics, South Africa still faces a quadruple burden of disease: communicable diseases (mainly HIV and tuberculosis); maternal, perinatal and nutritional conditions; non-communicable diseases; and injuries.

Investments in public health facilities have increased steadily since 1994, aiming to address the backlog, and keep pace with population growth. Improvements delivered included new and replacement hospitals, revitalisation of hospitals, new and upgraded clinics in previously underserved locations, and improved water, sanitation, electricity and safety facilities at all facilities. The DoH has shown commitment to and progress in improving the physical infrastructure and environment at every facility.

Infrastructure grants targeting infrastructure improvements were introduced in 1998 to ring-fence infrastructure budgets, and substantially adjust for historical inequalities in health infrastructure and doubled the infrastructure budgets to R500 million by 2002. Budgets increased fast, and averaged R8,6 billion per year since 2012. The bulk of the funds are transferred to the PHDs under strict conditions governed by the Division of Revenue Act. The accounting officer of each PHD is accountable for infrastructure delivery and management. The DoH is accountable for policy, guidance, monitoring, oversight.

The funding model decentralises infrastructure decision-making and delivery to the PHDs with oversight and coordination by the DoH.

- Infrastructure budgets focus on the following:
- Improving service delivery at existing clinics and hospitals using the Ideal Clinic or Ideal Hospital framework.
- Maximising the use of existing facilities by providing equipment, maintenance and rehabilitation.
- Implementing non-infrastructure solutions, including the NHI.
- Constructing new facilities.

The result has been exponential delivery in line with the increased budgets. However, expenditure depends on delivery capacity and some provinces have performed better than others, reflecting entrenched infrastructure inequities.

PHDs plan infrastructure investments based on patient loads, facility condition and suitability assessments, bed utilisation, ‘mission-critical’ analysis, and other data.

Access to healthcare facilities is generally good, but there are severe shortages of mental healthcare facilities, 30 to 40 locations are underserved in terms of primary healthcare facilities,

and there are shortages of level 2 and 3 beds. This is in addition to the difficulties in recruiting staff in some areas.

However, the condition of public healthcare facilities is poor. The South African Institution of Civil Engineering (SAICE) Infrastructure Report Card for 2006, 2011 and 2017 scored the overall quality of public healthcare facilities (hospitals and clinics) at E quality – at risk of failure.

There are 22 specialist public mental health facilities in South Africa. Public mental health infrastructure coverage varies from province to province. Fewer than 1 in 10 people living with a mental health condition in South Africa receive the care they need.

Metro municipalities running PHC clinics in agreement with the DoH include Johannesburg, Tshwane, Ekurhuleni and Cape Town.

During this MTEF, R7 billion was provided for infrastructure at new health facilities as well as the rehabilitation and maintenance of existing health facilities per year, addressing 298 facilities. Delivery is constrained by shortages of infrastructure specialists in the industry, in facilities, districts and provincial and national departments.

The health Project Management Information System is used to capture and report on capital project data.

Important infrastructure challenges that will have to be addressed going forward include the following:

2.6.2.1 Access to primary healthcare

With 3 472 public clinics, private clinics and GPs, PHC infrastructure coverage is generally very good across the country. There are between 30 and 40 locations where access can be improved and where new facilities should be considered to meet the target of 5 km or 30 minutes of travel to a clinic. Some facilities are very small for the populations that they serve and require expansion.

The Ideal Clinics and Ideal Hospitals systems tracking the quality of patient care reported that at the end of 2019/20, 55% (1906/3472) of facilities in the country were “Ideal”. Results per province varied from 29% in Limpopo to 91% in Gauteng. In the Medium-Term Strategic Framework (MTSF), 100% of all facilities must qualify as ideal by 2024/25.

Much of the existing public infrastructure is in poor shape. Up to one-third of existing facilities require significant maintenance. The national annual requirement is at least R476 million for maintenance of the existing PHC infrastructure. Up to 20% of the existing PHC facilities in poor condition (C1 or C2) need to be totally replaced at a cost of nearly R8 billion. Medical equipment requires regular replacement with adequate and appropriate technology at a value of R14 billion for the equipment in all PHC facilities in the country.

The South African public uses e-health solutions for anti-natal treatment and vaccinations. Poor internet access hampers adoption of other e-health solutions.

There is a serious shortage of community-based mental healthcare accommodation for long-term care.

2.6.2.2 Access to hospital care

Access to high-quality specialist hospital care in the private sector is unaffordable for most South Africans. Yet, the quality of public hospital infrastructure is poor. The SAICE Infrastructure Report Card for 2006, 2011 and 2017 scores the overall quality of public healthcare facilities (hospitals and clinics) at E quality – at risk of failure.

The annual maintenance requirement, based on the infrastructures’ current reported condition is approximately R2,12 billion (2015). The requirement for major refurbishments and partial or total replacement of existing infrastructure, based on the infrastructures’ current reported condition, is approximately R14,74 billion (2015).

Access to hospitals is inadequate in some parts of South Africa. An additional 1 347 level 1 beds are required by 2025 at 26 public hospitals that are overcrowded and provide less than 0,66 level 1 beds per 1 000 total population. These hospitals are the closest level 1 hospital care facilities to over four million people. The estimated capital cost including health technology is R3,4 billion (2015). The allocation of level 2 and 3 beds is inefficient. Realignment of the bed allocations is required within some referral districts to achieve the norms of 0,33 level 2 beds and 0,13 level 3 beds per 1 000 dependent population. The estimated cost of R17,7 billion would upgrade 25 existing hospitals and build three new hospitals to provide 3 300 new beds. Overcrowding at other hospitals can be relieved by work-sharing with the private sector hospitals.

There is particularly serious overcrowding in hospitals in Gauteng due to the rapid population growth.

There is a serious shortage of mental healthcare inpatient services for severe psychiatric conditions.

Practical medical, nursing and allied health academic training is completed at hospitals. There are shortages of learning or teaching facilities and accommodation for students.

2.6.3 Conditions required to achieve the 2050 vision for health infrastructure

There are seven conditions that must be met to achieve the 2050 vision for healthcare:

1 All people in South Africa must have access to quality health facilities supportive of globally competitive health outcomes:

- There must be sufficient primary healthcare, outpatient and inpatient units to service the catchment populations. All patients must be able to access central or tertiary services as well as specialist and forensic mental health facilities in their home province.
- Expectant mothers must be able to stay at the hospital in mother lodges until delivery, to reduce childbirth risks and paediatric caregivers.
- Mental health units must be built and fit for purpose in district and regional hospitals. Community residential care facilities must be established for people with severe mental illness.
- Transport must be available for patients needing care that is not offered near home.
- Medical education facilities at hospitals must accommodate more students with sufficient student accommodation, demonstration rooms, ICT, and learning or teaching facilities.

2 All health facilities must operate at acceptable standards suited to equitable quality service delivery:

- All health facilities must be safe for patients and staff, and meet the Ideal Clinic and Hospital standards.
- Healthcare facilities must be appropriately equipped.
- Equipment must be in good working order and enable health service delivery.
- Radiology, operating theatres, ICU and procedure rooms must be appropriately equipped, well maintained, and available for their intended use at least 80% of the time.
- All health facilities must be connected to broadband internet and use it for fire safety, nurse call, radiology imaging, financial management, patient records, security, facilities management, learning or teaching, etc.
- A monitoring system must be used to ensure all health facilities are safe and secure with reliable, well-maintained basic services.

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- Risk mitigation and response strategies must be in place to minimise the effects of extreme weather events, vandalism and theft.

3 Health infrastructure must be financially sustainable:

- Effective use must be made of the non-profit and private sectors to work-share, and increase institutional capacity to operate and maintain infrastructure.
- Consumption of water, electricity, coal and other fuel must be reduced as a result of improved quality of infrastructure, improved maintenance, local generation and consumption monitoring.

4 There must be robust partnerships and alliances between the state and private actors:

- Implementation of the National Health Insurance (NHI) financing system and blended project finance results in efficient public and private cooperation in healthcare service provision, infrastructure provision and maintenance, leading to more equitable access to healthcare services.
- Partnerships must be in place between the public and private sector for:
    - high-tech and specialist secondary and tertiary services, eg radiology, oncology, orthopaedics, neurology, dialysis, forensic mental health;
    - serviced care for mental health, palliative care, and other chronic conditions; and
    - screening, dispensary, diagnostic and other primary healthcare outpatient services.
- Frameworks must be in place for partnerships between the public and private sector for infrastructure provision and management.

5 Existing health infrastructure must be rehabilitated and maintained:

- All equipment and facilities must be maintained according to a schedule. All facilities must be compliant with safety regulations and obtain a municipal certificate of occupation. There must be approved plans for all buildings in a hospital.
- Asset management best practices must be implemented, including ring-fencing budgets and maintenance plans, as well as monitoring annual servicing and repairs to electricity, steam, compressed air, suction, medical gas, potable and fire water, cooling, heating, ventilation, lifts, stormwater and sewage systems, as well as periodic roof maintenance.
- Budgets and guidelines must assist health providers with facility maintenance.
- Budgets and provincial term service contracts must enable upgrades, repairs and maintenance to equipment, bulk services, electro-mechanical systems and buildings.
- A fault reporting and management system must monitor and report on breakdown and preventative maintenance.
- There must be accountability at each institution for repairs and maintenance of equipment, bulk services, electro-mechanical systems and buildings that are essential to reliably treating patients, and keep staff and patients safe with a focus on:
    - electro-mechanical systems that support the functioning of operating theatres, procedure rooms and supporting services (central steam sterilisation departments, national health laboratory services, blood banks, pharmacy stores and distribution hubs, emergency medical services, kitchens, mortuaries,

laundries, etc), including electricity, water, steam, medical gases, compressed air, suction or vacuum, lifts, cold-room, heating, IoT monitoring, and ventilation systems;

- medical equipment; and
- potable and fire water, boreholes, water treatment, sewerage, stormwater management pumps and systems, waste management and roofs.

- There must be ICT systems (fire safety, nurse call, radiology imaging, financial management, patient records, security, facilities management, learning or teaching, IoT monitoring, etc).

6 Health planning capacity must be proactive, robust and responsive:

- Health facility planning must be proactive, programmatic, well resourced and used to inform strategy and implementation.
- Roles, responsibilities and procedures must be clear.
- Decision-making for new facilities, upgrades and additions by PHD must be transparent, and health providers must be able to provide inputs into the decision-making processes.
- Data informing planning must be comprehensive and up to date.
- Simpler, cheaper methods must be used to report on the condition of facilities.
- Planning must consider patient catchment populations, demographics, patient transport, staff attraction and retention, the changing burden of disease, the development of public/private and online health options.
- An asset management information system must be used to help produce the annual infrastructure plans (U-AMP, C-AMP, IPIP, IPMP, AIP, APPN) and facilitate infrastructure planning in line with the FIDPM.
- Infrastructure planning and delivery must be aligned with provision of staff, equipment, and staff training.

7 Decision-making must be accountable and institutions effective:

- Institutions involved in managing health infrastructure must pay as much attention to the maintenance and rehabilitation of existing infrastructure as to the creation of new infrastructure.
- Institutional accountability, mandates, and roles and responsibilities must be clear for effective decision-making.
- Management must be effective, and human resources capability must match roles and responsibilities.

2.6.4 How the 2050 vision for health infrastructure will be achieved

Strategic element	2050 vision – How it will be done
Everyone has access to quality health facilities supportive of globally competitive health outcomes.	• Every five years accounting officers will assess and review the national priority project pipeline, in addition to the annual user asset management plan updates, comparing the size, location, condition and usage of facilities and equipment against the requirements. • Inappropriate healthcare equipment will be replaced. The DoH will continue national procurement of equipment term contracts for use by public healthcare providers. • The major (and often dangerous) poor conditions of hospitals will be addressed, including 30 hospitals with condition scores of 1/5 and 2/5.

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Strategic element	2050 vision – How it will be done
	• 20% of clinics that are in poor condition and cannot meet the Ideal Clinic minimum standards will be replaced with safe buildings. • New clinic facilities will be introduced in 30 to 40 locations where access can be improved to meet the target of 5 km or 30 minutes of travel to a clinic. • Hospital bed capacity will be augmented through the following: o Additional mental health units at all district and regional hospitals. o Additional forensic health facilities. o Realignment of the bed allocations at 51 hospitals to achieve the norms. o Partnerships with the private sector to work-share, especially for level 2 and 3 services. • Underutilised hospital buildings will be converted into lodges for expectant mothers, paediatric caregivers and patients in transit. • Medical education facilities will be expanded at hospitals. • An asset management system will be used to ensure all health facilities are properly sized and equipped, with reliable infrastructure.
All health facilities operate at acceptable standards suited to equitable quality service delivery.	• There will be partnerships with the private sector for equipment and facility maintenance. • A monitoring system using automated tracking (using IoT) will be implemented and will monitor the availability of operating theatres, radiology equipment, consulting, labour and procedure rooms, and consumption of water, electricity, coal and other consumables indicating poor quality infrastructure. • The budget and capacity for the office of health standards compliance will be strengthened to inspect all public and private healthcare facilities annually and ensure health facilities are safe for patients and staff and meet the Ideal Clinic and Ideal Hospital standards.
Health infrastructure is financially sustainable.	• Energy and water systems will be improved to reduce utility costs. • Medical and electro-mechanical equipment will be repaired or replaced, to avoid failures. • A facilities management information system, to improve infrastructure planning and facilities management, will be developed.
There are robust partnerships and alliances between the state and private actors.	• Partnerships will be established between public and private service providers for work-sharing including the following: o Long-term serviced care for mental health, palliative care, and other chronic conditions. o Screening, dispensary and other primary healthcare outpatient services. o Hospital services. o Laboratory, radiology, dispensing pharmaceuticals, diagnostic services, long-term care, research, manufacturing, and tele-medicine. o E-health systems – The identification a few top-priority pilots where PPPs are used to introduce overarching digital modernisation in the health sector must be considered. o Embedded-energy production on hospital sites (PV, solar thermal and biomass). o Energy- and water-saving at healthcare facilities.

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Strategic element	2050 vision – How it will be done
	• The Department of Social Development will develop community residential care facilities (including halfway houses, assisted living and group homes) to provide accommodation for de-institutionalised psychiatric service users, in line with national community-based care norm • All health facilities will be connected to broadband internet provided by others. • Reliability and usage will be monitored.
Existing health infrastructure is rehabilitated and maintained.	• Access, flooring, electricity, security, ICT systems, pharmacy cooling, ventilation, waste management, potable and fire water, sewerage, roofs, and stormwater management will be upgraded to meet the Ideal Clinic and Ideal Hospital standards • Accounting officers, with NT support, will budget for implementation of facility maintenance plans providing 1–4% of replacement asset value for each facility, averaging 1,7% of replacement asset value for the fixed asset portfolio. • Multi-year maintenance plans will be prepared for each facility. • Accounting officers will procure provincial term service contracts to enable the District and Hospital managers to implement: o annual servicing, repairs and maintenance to electro-mechanical systems, equipment, basic services and ICT systems; o periodic upgrading or replacement of roofs, stormwater, buildings, electro-mechanical systems, equipment, and basic services; and o rapid rehabilitation of facilities damaged by storms, fire or vandalism. • Accounting officers will monitor implementation of facility maintenance plans, and electricity and water costs. • Capacity for facilities management will be built, recruited and/or contracted, including a registered facilities manager, technical service manager and clinical engineer per district. • A fault reporting and management system will be implemented to track breakdown and preventative maintenance, to be updated every five years.
Health planning capacity is proactive, robust and responsive.	• The DoH will review the infrastructure norms, standards and design guidelines every 10 years to ensure equitable, affordable and achievable targets. • A prioritisation model, to balance needs against the available budgets, will be developed and implemented. • PHDs and DoH will assess and review, based on patient catchment scenarios, the size, location, condition and usage of facilities and equipment against the norms and standards, align with the healthcare service platform and update the national priority project pipeline every five years. Furthermore, an asset management information system as the source of data for infrastructure planning will be developed. This system will include: o patient catchment and other demographic data; o the condition of facilities, verified at least every five years using simpler and cheaper methods; o functionality to help produce the annual infrastructure plans (U-AMP, C-AMP, IPIP, IPMP, AIP, APP); o fault reporting and management system to track breakdown and preventative maintenance; and

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Strategic element	2050 vision – How it will be done
	○ monitoring of the availability of operating theatres, radiology equipment, consulting, labour and procedure rooms; consumption of water, electricity, coal and other consumables • Systems will be strengthened for healthcare providers to provide inputs into the decision-making process prioritising the project pipeline for projects funded or licensed by DoH. • The FIDPM for state-funded projects will be followed.
Decision-making is accountable and institutions effective.	• Roles, responsibilities and procedures will be clarified and reviewed every five years, including: ○ clearly defined processes for district and hospital managers to appoint service providers using the provincial and national term contracts; ○ clearly defined processes for escalating and prioritising expensive repairs, maintenance, upgrades and new equipment and facilities; ○ clearly defined processes for rapid repairs to infrastructure damaged by storms, fire, vandalism, etc; ○ guidelines for facility managers on preparation and implementation of maintenance plans; ○ clearly defined processes for deviations from the DoH design guidelines to improve the affordability of new infrastructure; and ○ with regard to where maternity services are offered between clinics, community health centres (CHCs), midwife obstetrics units, district hospitals, and regional and tertiary hospitals so that facilities can be appropriately sized and equipped to match the staff and patient numbers. • Provincial, district and facility managers' performance contracts will track infrastructure indicators including: ○ Ideal Clinic or Ideal Hospital compliance; ○ consumption of water, electricity, coal and other consumables indicating poor quality infrastructure; ○ usable beds as compared with approved beds (number and occupation); ○ hours per day each operating theatre was in use, this being reported to the facilities manager, hospital CEO, district executive manager, and provincial hospital services manager; and ○ implementation of facility maintenance. • Performance will be monitored and reflected in the Annual Performance Plan (APP).
Three-year actions	**Equitable access to healthcare facilities:** Increase the number of Healthcare facilities that satisfy minimum physical infrastructure norms and standards by: updating norms, standards and design guidelines for public and private facilities; developing a multi-year project plan aligned with the NHI; implementing infrastructure upgrades to meet minimum standards; connecting all clinics and hospitals to broadband internet; developing the facilities management information system to improve infrastructure planning and facilities management; and developing a multi-year plan for community residential care facilities for de-institutionalised psychiatric patients. [DSD mandate] **Quality of healthcare facilities**: Increase the number of healthcare facilities that satisfy minimum maintenance standards by: improving energy and water systems to reduce utility costs; implementing planned and unplanned maintenance according to the facility maintenance plan, health technology maintenance and replacement schedule; fully equipping, repairing or

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Strategic element	2050 vision – How it will be done
	replacing medical and electro-mechanical equipment to avoid failures; procuring or recruiting additional capacity to ramp up infrastructure management, including facilities managers, technical services managers and clinical engineers per health district; and implementing partnerships between public, private, donor and lender entities for maintenance.
SIPs	**SIP 12: Revitalisation of public hospitals and other health facilities** focuses on building and refurbishing public health facilities; revamping nursing colleges; allocating capital expenditure to prepare the public healthcare system to meet the requirements of the National Health Insurance (NHI) system; facilitating major builds of six hospitals. Progress is good. *SIP 12 will be augmented with greater focus on maintenance, health technology and equipment, damaged buildings, mental healthcare and on facility availability and utilisation rates.* **SIP 15: Expanding access to communication technology** focuses on providing broadband coverage to all households and health facilities. Progress has been slow. *SIP 15 will be augmented to ensure that all clinics and hospitals have internet access, with associated infrastructure and equipment that facilitate e-health, electronic patient records, fire safety, nurse call, radiology imaging, financial management, security, facilities management, and learning or teaching.* **SIP 20c: Energy embedded-generation investment programme** focuses on on-site energy generation at facilities. Most healthcare facilities comprise numerous single-story buildings on a large campus, and are suitable for on-site energy generation. Progress is slow. *SIP 20c will be augmented to ensure that on-site solar water heating and electricity generation is in place to reduce peak daytime energy loads at healthcare facilities.* **SIP 34: Student accommodation** focuses on DHET's SHIP to double the student residence beds available to first-year students and NSFAS-qualifying students, providing 300 000 beds at over 300 university and TVET college campuses over 10 years, by blending public and private funding. Progress has been adequate. *SIP 34 will be augmented to ensure that all tertiary students at remote hospitals have access to accommodation as required.* **SIP 28: PV and water savings on government buildings programme** focuses on ensuring water and energy security by reducing demand and on efficient use, improved building design and promoting alternative, renewable-energy sources. Progress has been poor. *SIP 28 will be augmented to ensure that there are energy- (electricity, coal and liquefied petroleum gas) and water-saving programmes at clinics and hospitals.*

3 CROSS-CUTTING SUPPORT TO THE INFRASTRUCTURE PLAN

3.1 DIGITAL CAPABILITIES IN INFRASTRUCTURE

HIGHLIGHTS

Features of digital capabilities in infrastructure by 2050

The NDP envisages a seamless information infrastructure that is universally available and accessible, at a cost and quality at least equal to South Africa's peers and competitors.

The NIP 2050, Phase 2, envisages seamless digital enablement and utilisation of existing and planned infrastructure in a way that lowers cost and improves the quality of service delivery.

How it will be done

- There will be continuous improvement in driving towards universal readiness for a digital world, including the achievement of universal broadband access, digitisation of government services, deepening of ICT skills and capabilities, and enablement of e-commerce, digital finance and digital entrepreneurship.
- A public sector broadband and digital services delivery model will effectively engage the private sector, through a growing range of innovative ways of partnering and cooperating.
- There will be sufficient and sustainable public and private finance that enables continuous improvement in delivering universal broadband and supportive ICT services to currently underserved communities and households as well as public institutions.
- Government will have substantial internal professional and technical capability in procuring and overseeing the implementation and operation of universal-broadband delivery and e-government services that operate at a global standard and quality of service, suited to South African conditions and that are continuously improving.
- There will be centres of excellence and think tanks that support private and public sectors to operate inclusively and innovatively to deliver on South Africa's digital imperatives in development.

Scope

The NIP 2050 Phase 1 outlined a vision and approach to achieving universal broadband infrastructure coverage and e-enablement. The emphasis was on achieving ubiquitous high speed internet enabling telecommunications infrastructure, with some reference to e-enablement.

In the NIP 2050 Phase 2 it is agreed that digital enablement cannot be viewed as a sector in itself, but rather it is an enabler for digital transformation progress across all sectors. It is therefore viewed and treated in an overarching manner with the aim to promote broader 4IR infrastructure beyond broadband that is infused into the public and private spheres.

This section below should be read with section 2.4 of the NIP 2050 Phase 1.

3.1.1 The 2050 vision for digital capabilities in infrastructure

The NDP envisages a seamless information infrastructure that is universally available and accessible, at a cost and quality at least equal to South Africa's peers and competitors. The NIP 2050 Phase 2 envisages seamless affordable digital enablement of existing and planned infrastructure in a way that lowers cost and improves the quality of service delivery.

3.1.2 Status of South African digital capabilities in infrastructure in 2022

All public infrastructure would benefit from digital enablement. While South Africa has made great progress in driving broadband coverage, access has been poor, as has public sector e-

enablement. The NIP 2050 Phase 1 notes that: 'the digitisation of government services could be used to improve the quality of service delivery, reduce costs to the fiscus and access marginalised and remote areas and communities. E-services have the potential to reduce the cost of living of citizens, for instance by reducing or eliminating the need to travel and queue for many government services. They could offer a key accountability and feedback loop mechanism through real-time data tracking and other methods.' Government capacity to deliver ICT-enlivened services is weak and there have been many false starts in implementing SA Connect. Public sector budgets and stated ambitions have narrowed, with less than R650 million allocated over the MTEF from 2022/3 to 2024/5, and yet the cost of connectivity and related digital infrastructure services for full enablement would cost over R30 billion. Beyond broadband and building digital enablement, there have also been false starts in important foundational areas such as the population registry, which should act as a centre point for all government services.

There is a particular meaning to digital enablement that delivers to infrastructure, in addition to the requirement of ubiquitous broadband:

- Physical data centre infrastructure.
- Technologies such as machine to machine (M2M), Internet of Things (IoT) and associated Artificial Intelligence – enabled machine learning.
- Data infrastructure and repositories that form the foundation for solutions for public digital service enablement:
    - A required population registry.
    - Development of efficient e-health and e-education services.
    - Social grant and policing information.
    - Regionally, the possible inclusion of registries of passenger transport vehicles and similar functions.
    - Extensive opportunities for IoT solutions to monitor critical infrastructure such as water and electricity systems, freight and passenger transport systems, and similar, in conjunction with data management to improve system monitoring, early warning, and repair and maintenance through sensors.
    - Development of digitally enabled fintech sectors.
    - Development of agri-tech solutions for more efficient farming, storage and distribution solutions.
    - Digitally enabled manufacturing, with a core focus on mechanisation.
    - Whilst considering adequate Data privacy, protection and security services

There are a range of experiments across South Africa; however, there is very limited system-wide movement as are found in countries like Malaysia, Vietnam, China and in many other emerging markets.

3.1.3 Conditions required to ensure digital infrastructure supports the 2050 vision for infrastructure delivery

In addition to conditions required to achieve universal broadband, there are five specific conditions to ensure that public infrastructure is digitally enabled to strengthen service delivery more generally. These include the following:

1 There must be continuous improvement in driving towards universal readiness for a digital world, including the achievement of affordable universal broadband access, digitisation of government services, deepening of ICT skills and capabilities in the public and private sectors, and enablement of e-commerce, digital finance and digital entrepreneurship.

2 A public sector broadband and digital services delivery model must effectively engage the private sector, through a growing range of innovative ways of partnering and cooperating.

3 There must be sufficient and sustainable public and private finance that enables continuous improvement in delivering universal broadband and supportive ICT services to currently underserved communities and households and to public institutions.

4 Government must have substantial internal professional and technical capability in procuring and overseeing the implementation of universal-broadband delivery and e-government services that operate at a global standard suited to South African conditions and that are continuously improving.

5 There must be centres of excellence and think tanks that support private and public sectors to operate inclusively and innovatively to deliver on South Africa's digital imperatives in development.

3.1.4 How the 2050 vision for digital infrastructure will be achieved

Strategic element	2050 vision – How it will be done
Government services and buildings are digitally enabled.	• All government buildings will be connected with fibre optic high-speed broadband to allow speed upgrades, and have sufficient services to make the broadband usable (LAN, WAN, equipment). • All government buildings will offer low-income users free Wi-Fi. • Government will implement the National e-Strategy and e-Government Strategy and Roadmap (2017). There will be clear role identification and approaches to ensure interoperability and data sharing. • Government e-enablement will be leveraged to promote a digital society and universal connectivity. There will be a target of 1 GB to home by 2025/6. There will be an accelerated focus on enhancing service delivery with e-health and e-education. • Universal access and public sector connectivity will rely primarily on government as procurer and regulator, with SOEs and private sector implementing. The Western Cape and Tshwane offer examples. • Digitisation in transport, energy and water infrastructure will be prioritised as a way of modernising and strengthening efficiencies in maintenance and operations. • There will be transparent monitoring and evaluation of digital services in the public sector.
Public sector capacity is strong and can drive the required policy agenda.	• Government capacity to design and procure digital infrastructure and services projects will be technically sound. • There will be commitment to institutional stability, good governance and appropriate capacitation through senior appointments.
Private sector participation in achieving universal broadband access is prevalent.	• The model of delivery will increasingly leverage vibrant private sector participation and blended financing. It is envisaged that R30 billion to R80 billion will be raised to finance the rollout of government broadband and services in the medium term. • There will be special vehicles promoting blended finance in public broadband infrastructure. Among other things, these provide incentives for de-risking private sector investments for affordable services in rural areas and accelerating broadband delivery in peri-urban areas, demand-side schemes for subsidising low-income consumers' communication costs, and innovative use of unlicensed spectrum (Wi-Fi, TV whitespace). • The allowable period for public procurement of telecommunication companies (telecoms) and digital services will be lengthened, to enable private provision in ways that also deliver services to underserved communities and monetised over 10–20 years. • Special tax and/or grant mechanisms will be considered, in consultation with NT and the private sector, to enable the deploy broadband into income areas that traditionally would not be feasible.

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Strategic element	2050 vision – How it will be done
	• The capability and regulatory frameworks will be strengthened to enable different forms of partnership and alliances between public and private sectors, as discussed in section 4 of the NIP 2050.
Partnerships are strong and there are centres of digital excellence promoting a growing knowledge base of delivery and innovation.	• Globally, governments and regulators struggle to keep up with fast-moving digital trends. This is also true for South Africa. Meaningful sustained partnerships and knowledge forums will be leveraged and engage government, business and other stakeholders in a focused and practical manner. These will enable governments and regulators to keep up with fast-moving digital trends and contribute to strengthening private-public cooperation and joint learning. There will be a number of formations that could serve this need, such as the Presidential Commission on 4IR (PC4IR) and/or the Public–private Growth Initiative (PPGI).
The ICT skills base is robust.	The ICT skills base will be continuously improving, creating an e-savvy nation and offering sufficient support to private and public investments. Some of the priorities include the following: • Connecting all schools by 2023, with supportive digital services in the school and in the cloud, and providing free Wi-Fi to service youth from low-income households nearby. • Centres of excellence being supported to innovate in digital teaching and learning methodology from school to PSET. ICT training would need to be core in the teacher professional development curriculum and in ongoing professional development. • Development of basic digital and data literacy across the population. • Stronger partnerships between vocational training and industry, to ensure relevance of curriculum and pathway into digital apprenticeships and workplace learning. • The causes of poor throughput of high-quality ICT graduates being identified and addressed. • Opportunities for unemployed youth to gain digital literacy and related vocational skills being created and acting as a significant channel to work. • Critical technical skills to operate and maintain digital infrastructure being developed and available in South Africa. • Innovation in the ICT industry and testing of newer cost-effective technologies for broadband penetration taking place. • Links to international accelerator programmes through ICT organisations like ITU and GSMA to boost the youth e-readiness being enhanced.
Three-year actions	• Executive leadership of government departments, entities and the regulator responsible for digital delivery will be stabilised and appointed according to capability. • Arrangements required to enable private participation in public interest digital delivery will be in place by 2022/3. Most immediately, this will include special vehicles to promote blended finance and procurement rules that enable long-term partnerships such as the proposed Broadband Fund. • The model of public procurement will be established and operating public–private partnerships and alliances. • 80% of public buildings, especially schools, health facilities and police will be connected by 2024/5, in line with the targets of government's MTSF.

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Strategic element	2050 vision – How it will be done
	• Local and provincial government broadband and related ICT initiatives will be streamlined and rationalised, with mandates, roles and responsibilities clarified. • The model for public–private partnerships will be progressed with material impact on delivery. **Government will identify three top-priority pilots where partnerships are used to introduce overarching digital modernisation. Examples are policing, health, education, water and smart cities.** • Digitisation of government services will be scoped and projects identified and funded. • The population registry will be completed in 2022/3. • A data centre and cloud strategy will be finalised in 2022/3. • There will be consideration of smart-city policies. • **There will be specific support to at least three major service delivery innovation pilots in smart mobility such as the Minibus Taxi Blue Dot programme or innovations in smart water metering and/or e-education and e-health solutions.**
SIPs	• **SIP 15:** Extends broadband coverage by (among other things) establishing core points of presence (POPs) in district municipalities; establishing POPs and fibre connectivity at local level; and facilitating government co-investment in townships as well as for e-government, school, and health connectivity. The SIPs should be made specific to include the following objectives: o The population registry being treated as an infrastructure project and completed in 2022/3. o At least 80% of schools being connected by December 2023. o Local and provincial government broadband and related ICT initiatives being streamlined and rationalised, with mandates, roles and responsibilities being clarified. o The model for public–private partnerships being progressed with material impact on delivery. Government will identify three top-priority pilots where partnerships are used to introduce overarching digital modernisation. Examples are smart policing, smart mobility, e-health, e-education, and smart cities, including smart metering and system monitoring.

3.2 CRIME AND CORRUPTION

HIGHLIGHTS

Features of infrastructure safety, security and ethical delivery by 2050

By 2050, South Africa's infrastructure can be planned, procured, built, maintained and used without material risk of crime or corruption.

How it will be done

- There will be demonstrated capacity to successfully identify, arrest and prosecute offenders
- There will be integrity of internal controls in institutions that own or provide infrastructure to reduce corruption and complicity with criminality
- Infrastructure will be physically secure and protected from violence, vandalism and theft
- The value of stolen infrastructure will be reduced, reducing incentives to steal and making it harder to monetise stolen metals, especially copper

3.2.1 The vision for safety, security and ethical delivery of infrastructure

By 2050 South Africa's infrastructure will be able to be planned, procured, built, maintained and used without material risk of crime or corruption.

3.2.2 The status of crime and corruption in South African infrastructure in 2022

Criminality, in multiple forms, is undermining the delivery of public infrastructure, its maintenance and the use of its services. The threat is omnipresent, heterogenous, flexible and shifting, and affects the entire value chain from project conception to the delivery of infrastructure services.

The costs of crime and corruption are very material and can be measured in significant loss of life and destruction of property, wasted spending, higher costs, reduced utilisation, reduced exports, and in the non-payment of user charges.

Criminality is not merely opportunist. Criminal groups actively seek vulnerabilities to exploit but also seek to create new vulnerabilities across the value chain:

- Criminality shapes decision-making and resource allocation in infrastructure providers and drives changes in the use of services.
- Criminality adapts to operational changes.

Overall, infrastructure-related crime is more challenging than is typical for infrastructure delivery in other jurisdictions, and necessitates continual reassessment of risks and strategic responses.

Additionally, some attacks on infrastructure appear to be politically motivated, making prevention even more difficult.

3.2.2.1 Typology of crime threats

There are four basic kinds of infrastructure-related crime threats:

- Crime affecting the provision of infrastructure, especially corruption in the procurement process and in the extortion of service providers.
- Crime directed at infrastructure itself, especially theft of copper and steel.
- Theft of infrastructure services, such as non-payment of electricity or water.
- Crime directed at users of infrastructure.

All crimes affect the costs of infrastructure services incurred by users and/or tax-payers, either directly or because they raise the cost of providing infrastructure. Costs are also imposed on users when use of infrastructure exposes them to risk of criminality.

From the infrastructure provider's point of view, criminality affects costs in two different ways:

- It raises the costs of delivery of infrastructure or services, in which case costs are passed on to users.
- Infrastructure provision literally fails as a result of crime, imposing costs on the infrastructure provider but denying them the means to recover those costs from users, in which case costs have to be recouped in other ways (eg through higher tariffs or increased reliance on bailouts from the fiscus).

3.2.2.2 Theft of infrastructure

Some of the most common infrastructure crimes revolve around the theft of metal, itself a consequence of high metals prices and rising demand for scrap. This is particularly the case for copper cable and steel rail sidings.

It is estimated that copper theft on South Africa's rail and electricity grids imposed an economic cost of more than R45 billion in 2020/21. This figure includes replacement costs, lost revenues on the rail network, forgone revenue in the mining industry and some other costs. It excludes costs of copper theft from networks other than rail and electricity (eg telecoms, construction, mines themselves). It also does not include the long-run costs of declining business confidence and foregone investment, higher insurance costs, and the costs incurred by businesses and households in securing alternative sources of backup power. In addition, violence between gangs involved in illegal mining and cable theft have created instability in some communities, with reports linking some of the massacres at taverns in Gauteng in July 2022 to rivalries and turf wars between opposing factions.

Examples

- In its latest annual report, Transnet reports that in 2021/22 some 1 500 km of cable had been stolen.
- Between 2017 to 2021, the length of cable stolen from Transnet's lines each year increased from 120 to 724 km. Incidents have become more sophisticated over time, with the average length of cable stolen in each incident having nearly tripled to 200 m.
- A single mining company reported over 100 theft incidents in 2021.
- Cable theft, and its policing, is also very dangerous, with scores of deaths of would-be thieves and security guards recorded in the past few years.
- In its 2020/21 annual report, SAPS noted that the building of new police stations was delayed as a result of 'interruption by construction mafias and business forums (criminals holding contractors to ransom, threatening workers and damage property, demanding a cut from construction projects).'

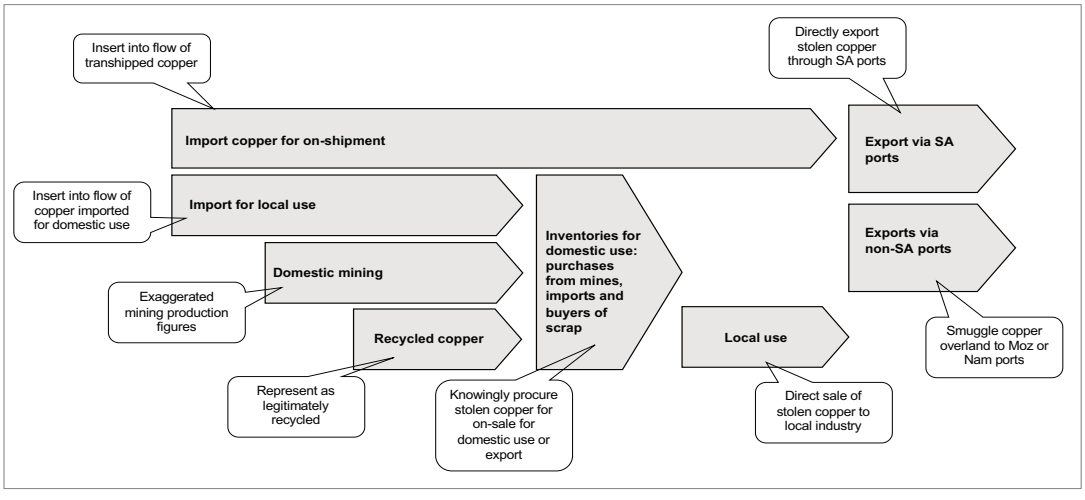
In aggregate, the costs of copper theft may exceed 1% of GDP annually, while rising prices of key commodities, especially copper in its essential role in the global renewable-energy rollout, will continue to act as a crime incentive if unchecked.

An important factor in explaining high levels of infrastructure theft is that SOEs' interests and incentives do not align perfectly with those of society: Because most of the costs of infrastructure-related crime are borne by society rather than the owners of that infrastructure, and because the SOEs and public agencies that own infrastructure are not cost-minimising businesses, SOEs tend to under-invest in the protection of their assets. Greater attention to

the extent to which effective plans are in place to protect infrastructure needs to be incorporated into SOEs shareholder compacts and public entities' managers' performance agreements. In this regard, the building of partnerships with stakeholders in the private sector is crucial, as evidenced by the work being done to secure infrastructure of the rail line to Richards Bay. Having said that, the distributed nature of the relevant infrastructure networks renders them vulnerable to determined criminals, especially those who are willing to use violence when confronted by police or security.

Although some threats to infrastructure are political or are intended to limit the choices available to users of infrastructure (eg by limiting commuter bus or train services in order to ensure greater utilisation of taxis), most attacks on South African infrastructure are intended to secure valuable commodities. In order to derive benefit from their crimes, however, metals thieves must be able to monetise the stolen goods. In order to do this, stolen metals must be integrated into flows of 'legitimate' metals, as illustrated in Figure 1.

Figure 1: Flows of copper into, through and out of South Africa



The integration of stolen metals into these flows can be done in two ways:

- Stolen metals can be sold to legitimate recyclers who quickly strip it of identifying characteristics and smelt it, chop it, granulate it or shred it into a form that makes the stolen metal unidentifiable and impossible to prove that it was stolen. These can then be sold into legitimate flows.
- Stolen metals can be smelted, chopped, granulated or shredded by unregistered (ie illegal) recyclers so that it is unidentifiable as stolen, and then sold into legitimate flows or exported directly.

Given the essential requirement that the stolen goods enter legitimate flows if they are to be monetised, changes to the regulatory regime governing the recycling of metals and the buying and selling of scrap and semi-processed metals could reduce the opportunities for monetisation and, ultimately, the incentive to steal metals. Critically, it is important to understand both the benefits and the costs of this approach since the regulations introduced in this industry will impact on the following:

  - The employment and income of those engaged in the circular economy, including very vulnerable workers such as waste-pickers.
  - The commercial viability of recycling activities, since the additional regulations might increase cost significantly, leading to closure of legitimate operations. This

could also make recycling operations inaccessible in smaller centres, with economic and environmental implications.

- Reduced business creation in parts of the manufacturing sector if licences regulate the buying and selling of scrap and semi-processed metals, and if licence fees result in some firms not being commercially viable.

3.2.2.3 Extortion of service providers

Extortion of service providers occurs at the point of delivery, leading to delays, non-delivery and higher costs. This relates to so-called 'construction mafias' that have plagued building sites, especially in KwaZulu-Natal, in recent years, extorting a fee under the guise of demanding local participation in construction projects. In April 2019, it was reported that at least 183 infrastructure and construction projects worth more that R63 billion had been affected by these disruptions across. The prevalence of such incidents mean that construction costs are significantly higher than they need to be.

3.2.2.4 Crime directed at the infrastructure: destruction or damage of infrastructure for political or commercial motivations

The destruction of some infrastructure appears to be motivated by a positive desire to disrupt service delivery for commercial motives (eg there are suspicions that some of the destruction of PRASA infrastructure is caused by other providers of commuter transport or by PRASA's own service providers) or political motives (eg some of the destruction or damage of some Eskom infrastructure). A clear example of high and rising levels of destruction of infrastructure is associated with service delivery protests and, even more seriously, the near-insurrection of July 2021.

3.2.2.5 Corruption in procurement of infrastructure

The threat and impact of corruption in the procurement of infrastructure deepened during the period of State Capture, but has continued in recent years. This corruption raises the cost of infrastructure. There are also important instances where corruption led to significant expenditure without any material infrastructure delivery.

Most important are threats arising from **corruption** within the institutions that own the bulk of South Africa's public infrastructure: Eskom, Transnet, SAA, PRASA and the local government. The period of State Capture was characterised by this kind of risk, all of which dramatically raises the costs of delivering infrastructure. This results in raising the tariffs that must be charged to end users if the cost of provision is to be recouped and/or increased costs to the fiscus of supporting entities providing infrastructure. The costs of this kind of corruption in the era of State Capture probably outweigh the costs of cable theft if one includes the impact of State Capture on business confidence and levels of investment, both of which fell dramatically and have not yet recovered.

Examples

- Deliberate manipulation of investment decisions to ensure outcomes from which large rents can be extracted ('rigged investment decisions'). Examples: attempt to pursue nuclear deal, 'tall trains' tender at PRASA, and the attempt to manipulate SAA's routes, or the manipulation of design specifications at some of Eskom's build projects.
- Deliberate manipulation of tenders ('rigged tenders'), whether in relation to ordinary business of the entity or business conducted on the basis of rigged procurement decisions (examples: tender manipulation relating to coal, fuel oil and diesel deliveries; the appointment of security companies; overpriced goods and services; unjustified delays in construction projects).

- 'Backoffice corruption', eg decisions in various SOEs to direct advertising to *The New Age* or Transnet's decision to appoint Regiments Capital to manage treasury operations.

To date, law enforcement agencies have had only very limited effect on high levels of corruption, theft and the destruction of infrastructure – the incidents, sophistication and impact of which have, in some cases, risen exponentially over the past two decades. This suggests a degree of impotence from state agencies and impunity of offenders. This is not to say that there have not been some successes, but those successes have been inadequate to stem, much less reverse, the damage being done to South Africa's infrastructure.

3.2.3 Conditions required to ensure infrastructure is protected from crime and corruption in support of South Africa's 2050 vision

South Africa's infrastructure is subject to a wide range or evolving risks associated with ruthless, sophisticated and entrepreneurial criminal syndicates that are capable of adapting to changes in the quality and quantity of enforcement. These threats do not all originate from the same syndicates (though there are doubtless links between some of them), but the multifaceted character of the threat increases exponentially both the cost of infrastructure-related criminality and the difficulty of reducing it.

In this context, government, working with its social partners, will develop a vigorous and flexible approach to securing infrastructure. Requirements underpinning success include the following:

1 **There must be demonstrated capacity to successfully identify, arrest and prosecute offenders:**

- The number of arrests and successful prosecutions of people involved in the theft of metals must rise each quarter until the number of incidents in which metals are stolen has fallen substantially.
- The quantity of stolen metals recovered in each period must account for a rising percentage of the quantity stolen.
- Law enforcement and the intelligence agencies must identify syndicates involved in infrastructure-related crime, especially theft and the extortion of service providers.

2 **There must be integrity of internal controls in institutions that own or provide infrastructure to reduce corruption and complicity with criminality:**

- Action must be taken on findings of various commissions of enquiry and criminal investigations into corruption where these relate to procurement of infrastructure.
- In entities in which large-scale corruption has been identified, contracts must be reviewed.
- Integrity checks and lifestyle audits of all officials involved in the design and procurement of infrastructure projects must be completed timeously.
- Protection and encouragement of whistle-blowing must be encouraged and, where appropriate, incentivised.

3 **Infrastructure must be physically secure and protected from violence, vandalism and theft:**

- All owners of public infrastructure must be required to develop credible plans for protecting existing and planned infrastructure, which should partner with the private sector where possible. Investments in new technologies and capabilities are expected where theft and damage of infrastructure are significant.

- In entities in which the theft or destruction of infrastructure are high and a rising problem, contracts with security providers must be reviewed.
- Where possible, incentives should be offered to staff who develop effective approaches to reducing criminality.

4 **The value of stolen infrastructure must be reduced, lowering incentives to steal and making it harder to monetise stolen metals, especially copper –** Interventions are designed to disrupt the monetisation of stolen materials by disrupting the trade in stolen goods and their integration into legitimate flows of material

3.2.4 How the 2050 vision for addressing crime and corruption in infrastructure will be achieved

Strategic element	2050 vision – how it will be done
There will be demonstrated capacity to successfully identify, arrest and prosecute offenders.	• **The role of law enforcement will be strong in reducing corruption:** o Corruption in institutions that own and/or deliver infrastructure will be addressed with meaningful demonstration of criminal accountability from those who engage in corruption. o Sufficient financial and human resources will be deployed to prosecuting crimes committed during the period of State Capture while also focusing on threats and risks in the present. A dedicated, independent and appropriately resourced and empowered agency designed to police corruption within government (and perhaps incorporating existing agencies) as proposed by the Zondo Commission will be established unless a more effective institution can be identified. Given significant spending on infrastructure delivery and maintenance, a core focus of such an agency will be corruption committed in these domains. o Legal innovations will be used to improve the effectiveness of the policing of corruption. This will include legally sanctioned 'lifestyle audits' that are empowered with appropriate instruments such as 'unexplained wealth orders' that would require officials in positions of authority or decision-making in these institutions to explain any apparent divergence between their lifestyles or wealth and legitimate sources of income. These need to be expedited. o Legal processes relating to the prosecution of corruption will be simplified and the process of bringing officials to court on the minimum number of charges or counts needed to secure a first conviction will be expedited. Dedicated courts will be considered. o The capabilities, knowledge and skills of the investigators of these cases should be improved regularly. o The investigators should work hand in glove with the prosecutors when preparing case dockets for the court to ensure that the case complies with all prescripts and is watertight and possible loopholes are prevented to ensure better convictions. o Whistle-blowing will be encouraged and even incentivised (eg including the possibility of paying rewards proportional to the savings obtained as a result of whistle-blowing). Whistle-blowers will be protected from reprisals. • **Theft of metals and destruction of infrastructure will be materially reduced:** o There will be dedicated policing of the theft of metals from infrastructure. This will focus on increasing the risk of being

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Strategic element	2050 vision – how it will be done
	caught for those involved in metals theft, and include the following: ▪ Rapid response to incidents, especially in cases of destruction of property/arson. ▪ Identifying syndicates through crime intelligence and informers and agents, buy-bust operations and other forms of proactive investigative work, as well as gathering of information and intelligence from anyone arrested in the act of stealing metals or handling stolen metals. ▪ In the short and medium term, active monitoring of the performance of the justice system in relation to the theft of metals, with a focus on the following: • The number of incidents reported and the quantity of material stolen. • The number of arrests made. • The quantity of stolen materials recovered by quarter (especially in comparison to the quantities stolen over the same period). • The number of prosecutions initiated. • The number of convictions handed down. • **The ability to monetise stolen metals will be contained:** o Stolen metals are monetised by integrating them into the flow of metals used in domestic industry or exports. Policing of the trade in stolen materials will be capacitated, a process that could be strengthened through suitable reforms to the industry itself (see below). Key focus areas include the following: ▪ Increased vigilance by SAPS designated officers of registered recyclers to identify those purchasing stolen metals or providing services to metals thieves. ▪ Dedicating intelligence (including financial intelligence) resources to profiling recyclers. ▪ Increased vigilance and enforcement of containerised exports to identify smuggling and mis-invoicing. o Consideration will be given to introducing 'sentence enhancements' for violations of regulatory and administrative requirements in the industries into the flows of which stolen metals are introduced where these violations may increase the likelihood that stolen metals will be integrated into flows of legitimate scrap and semi-processed metals (see below).
There will be integrity of internal controls in institutions that own or provide infrastructure to reduce corruption and complicity with criminality.	• **State infrastructure entities will be held to account in having robust internal controls to reduce the opportunity for corruption and collusion between syndicates and 'insiders':** o There will be a segregation of duties, integrity testing of officials, and oversight of tender and procurement processes, including much greater transparency (including to the public) of tender awards and payments. o There will be enhanced investment in internal audit and forensic capabilities. o Whistle-blowing will be enabled.

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Strategic element	2050 vision – how it will be done
	○ Procurement processes will be designed to minimise the opportunity for corruption, including by reviewing the value-add of intermediaries. ● **Suitable staff will be appointed with demonstrated commitment to a high level of integrity and with sufficient 'subject' knowledge and expertise to understand and identify mispricing of goods and services in their organisation.**
Infrastructure will be physically secure and protected from violence, vandalism and theft.	● **Owners of infrastructure will be required to protect it from theft and destruction:** ○ All owners of public infrastructure must be required to develop credible plans for protecting existing and planned infrastructure. Investments in new technologies and capabilities are expected where theft and damage of infrastructure is significant. ○ In entities in which the theft or destruction of infrastructure is high and a rising problem, contracts with security providers must be reviewed. ● **Strategies to protect infrastructure will include the following:** ○ Permanent use of drone and remote-sensing technology backed up by the capacity for rapid, armed response to incidents of theft. ○ Use of alloys (or hard-to-remove layers strands of plastic or rubber) wherever possible to reduce the desirability of stolen metals that are intended for smelting. ○ Robust access control to plant and equipment stores, as well as investments in enhanced security such as CCTV (and smart CCTV) cameras. ○ Ongoing integrity checks of staff, including in the security departments (all of whom must be PSIRA-approved and vetted), and the rotation of duties to reduce the risk that they may be bribed or threatened to provide the information when they are put under pressure.
The value of stolen infrastructure will be reduced, lowering incentives to steal and making it harder to monetise stolen metals, especially copper.	**The feasibility of the following actions will be assessed and implemented where they are found to be potentially high-impact solutions:** ● Banning the import of smelting equipment except by licensed recyclers. ● Ensuring a strict licensing regime where only appropriately vetted entities can buy and sell scrap and semi-processed metals, complemented by regular reporting of all purchases and sales to ensure complete visibility of all flows. ● Rendering it illegal to trade metals for cash, so that it is easier to trace buyers and sellers. ● Banning the export of scrap and imposing new export licence requirements for exporters of semi-processed metals. ● Improving the marking of cables and infrastructure to make identification of stolen materials possible.
Three-year actions	● **Law enforcement agencies will make significant progress in reducing infrastructure-related crime:** ○ There will be a high and rising number of arrests of people involved in infrastructure-related crime. ○ The quantity of recovered stolen material in each period will be a rising percentage of stolen material.

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Strategic element	2050 vision – how it will be done
	○ Law enforcement and intelligence agencies will have identified syndicates involved in the theft of materials and in the extortion of service providers, resulting in a high and rising number of arrests and successful prosecutions. ● **Internal governance will be reviewed to minimise vulnerabilities to corruption:** ○ Integrity assessments of key staff will be completed. ○ All long-term contracts will be reviewed in entities in which high levels of corruption have been reported. ○ Whistle-blowing systems will be strengthened and, where appropriate, whistle-blowing will be incentivised. ● **Infrastructure providers will work with authorities to investigate already-reported crimes or allegations:** ○ All findings from criminal investigations and commissions of enquiry will have been implemented by the relevant authorities. ○ Cooperation with police or prosecutors will be maximised, and adding urgency to their work. ○ Whistle-blowers will be supported, encouraged and incentivised. ○ Supportive resources will be provided (private investigators, additional investigative resources). ○ New strategies for reducing theft and damage of infrastructure will be in place. ● **Authorities will move towards offender-based strategies, seeking to identify and roll up networks of the most serious repeat offenders** – Intelligence-led investigations will focus on offenders and the scrap or recycling industry.

3.3 GOVERNANCE OF PUBLIC DISTRIBUTED INFRASTRUCTURE DELIVERY

HIGHLIGHTS

Features of governance and oversight of infrastructure delivery by 2050

All planning will be efficiently coordinated vertically, across spheres and tiers of government, horizontally between municipalities, and between municipalities, provinces and state entities. Within municipalities planning will be integrated across sectors and activities and will be undertaken with participation of communities and enterprises.

By 2050 there will be confidence in the integrity of government systems and capacity of institutions to deliver the required infrastructure and associated services while ensuring value for money and social accountability. Government will be organised in a way that enables efficient and effective infrastructure delivery. There will be robust technical capability and an ability to mobilise capacity from business and civil society where appropriate.

MRE of distributed infrastructure will become regularised, systematised and transparent.

How it will be done

- **Planning:**
  - Infrastructure planning will be integrated vertically across spheres and tiers of government and horizontally across provinces and municipalities.
  - Planning for infrastructure will be informed by spatial planning priorities and by financial factors.
  - Social accountability and engagement practices in infrastructure planning will be robust.
- **Delivery Management:**
  - The institutional framework and roles of national, provincial, district and municipalities will be clear.
  - There will be robust and high-impact capacity building programmes tailored to specific categories of local government.
  - There will be an asset management system for infrastructure throughout the life cycle.
  - There will be a high professional and technical standard of capability serving local government infrastructure build and maintenance.
  - The procurement system will be robust.
  - Conditions for private sector support and partnerships with local government will be optimised.
  - The structure and performance of SOEs that provide settlement-related services – specifically Eskom, water boards and PRASA – will be strong.
- **Monitoring, reporting and evaluation:**
  - Coordination of infrastructure MRE will be integrated within a governmentwide monitoring and evaluation system (GWMES).
  - Systematic planning, budgeting and MRE reforms for built environment will be institutionalised.
  - Evaluations will be integrated into the infrastructure planning life cycle.
  - Evaluation capacity will be decentralised, mainstreamed and resourced.
  - Infrastructure information will be publicly accessible and transparent as well as empower oversight of citizens and communities.

3.3.1 Planning frameworks

3.3.1.1 Vision for planning of distributed infrastructure

All planning will be efficiently coordinated vertically, across spheres and tiers of government, horizontally between municipalities, and between municipalities, provinces and state entities.

Within municipalities planning will be integrated across sectors and activities and will be undertaken with participation of communities and enterprises.

3.3.1.2 Status of planning of distributed infrastructure in 2022

Planning across spheres of government

There are extensive planning requirements imposed on provinces and municipalities, most of them sound. There are also necessary requirements to plans to be coordinated on. For example, all infrastructure planning is required to conform with the Intergovernmental Planning Framework Act (IGPF), 13 of 2005.

However, in practice there are concerns in relation to the planning approach hindering delivery:

- Planning systems and requirements do not sufficiently recognise the differentiated nature of municipalities, as well as the role of provinces. Aside from undertaking the planning for their own functions (roads, education and health facilities), provinces have a key role to play in assisting with planning and coordinating activities in respect of human settlements, roads and public transport outside larger urban areas. The differentiated approach will allow smaller municipalities to deliver more effectively with simplified requirements, while larger urban municipalities are meant to have the capacity to plan their own human settlements, public transport arrangements and other municipal services and should have the capacity to do that – in which case they should be left to do that – with provinces in support.
- While the integration of plans across spheres and tiers is a critical concern, the DDM, outlined in is meant to address this concern – outlined in Figure 2.
- There are too many planning requirements imposed on municipalities that do not bring sufficient benefit and are often not sustained.
- All too often plans are made without reference to finance and implementation capacity and therefore cannot be successfully implemented.

DDM is primarily a planning and budget alignment approach that 'Introduces new IGR planning, budgeting and implementation paradigm and discipline (spatial targeting and budgeting towards common long-term outcomes)'. It also has capacity building and institutional reform objectives through which it meant to integrate capacity building support to districts or metros for hands-on support, and over time to review the distribution and location of powers and functions as well as facilitate appropriate location in the two-tier district system. The DDM was introduced formally in 2020 with COGTA's draft guidelines (March 2020) and the guidelines around the DDM implementation (October 2020). The DDM is based on hubs set up by COGTA and staffed with a team of specialists appointed by COGTA, including a planning, infrastructure, capacity building and finance specialist. The scalability of this model will be a challenge: there are 52 district spaces that exist and would require staffing and oversight. There are some concerns that the DDM functions are migrating towards creating a parallel administration alongside municipalities as opposed to being aligned with the original intention to support planning, budgeting and implementation.

In practice, it appears that cooperation between districts and local municipalities has been poor. Local municipalities often distrust districts and the extent to which district planning benefits local municipalities to date has been uneven.

All districts have a statutory responsibility for the planning of public transport, disaster management, fire and solid waste management that have some impact on infrastructure. The extent to which this is coordinated between districts and local municipalities is uneven.

Figure 2: District Development Model

Source: DDM Guideline

There has been substantial friction between provinces and larger cities in planning human settlements and public transport. Spatial planning interaction is also important around health and education facilities – both in terms of planning approvals and for other social infrastructure to support human settlement development. Spatial planning integration between provinces and municipalities is mandatory in terms of Spatial Planning and Land Use Management Act (SPLUMA), 16 of 2013, but coordination has been a challenge.

All the four big state entities – PRASA, water boards, Eskom and SANRAL – play a major role in planning for infrastructure, within metros specifically. This is a contested area.

Planning in provinces

Provinces have specific planning requirements for their own activities that include:

- provincial growth and development strategies (PGDSs) for long-term planning;
- a provincial strategic plan with a five-year horizon; and
- a provincial spatial development framework,

with these all guiding departmental master planning and annual planning. In general, this area of planning appears to function reasonably well.

Roads have a classification system that spreads ownership across the lines of provinces, districts and local municipalities. This can hamper effective planning where there are confused lines or contested terrains. Provincial roads departments currently have little impact on municipal roads planning. Where roads integration is a concern at the metro level, clarity should be provided in assigning that planning coordination responsibility to the metro. There are particular problems that arise around planning and prioritisation misalignment, particularly in respect of interchanges between local and provincial or national roads.

Provinces are responsible for public transport planning. However, this is a contested area within metros that also undertake public transport planning. Outside the metros, the role of provinces relating to public transport planning becomes more important. Integration of public transport plans is most important in Gauteng as there are such big cross-boundary issues. In other provinces planning coordination is more important outside metros.

In infrastructure planning for health and education, the Infrastructure Delivery Improvement Programme has played a critical role, including with the establishment of the Infrastructure Delivery Management System (IDMS). Planning for health and education facilities is generally sound.

Provinces are responsible for planning human settlements and housing. They are meant to aggregate data on local demographic growth, economic growth and spatial distribution thereof to inform local government planning. Provincial human settlement planning is a strong driver of local spatial and economic growth but often done in isolation from local planning. Looking forward, provinces may need to step back from human settlements planning in metros and larger intermediate cities, instead focusing on this activity for smaller towns and rural areas.

Planning within municipalities

Development plans: City development strategy frameworks are meant to be long-term, and this is becoming an increasingly common practice; however, there has been frequent change in line with political office. Integrated development plans (IDPs) are conceived as a central plan supplemented by sector planning. However, they are sometimes undermined due to poor process and implementation. There can be tension between where the Spatial Development Framework (SDF) is more long-term than the IDP, but nevertheless needs to be informed by it. The SDF is loaded with onerous statutory requirements (human settlements plan, capital expenditure framework, and similar), which make it expensive and time-consuming to complete. This planning framework is complex and very difficult to implement for smaller municipalities. This leads to poor implementation of statutory plans. There is a need for a simplified planning framework for smaller municipalities, centred on the IDP.

Asset management plans: A basic asset management plan is meant to include an asset register, a plan for new infrastructure and renewal of existing infrastructure, a plan for operation and maintenance, and assurance that sufficient funding is available. At its most complex it requires the activities shown for the Cities Infrastructure, Delivery and Management System (CIDMS) toolkit, as presented in Figure 3. There are several guidelines for asset management that have become outdated and overlap, including the COGTA guideline 2006–2009, NT's local government asset management guideline 2008, and NT's guidelines (Auditor-General). In addition, there are overlapping responsibilities of CoGTA and NT, which is a concern. The uniform guidelines set a very high standard, which are not commensurate with the capabilities and resources of many municipalities. A differentiated approach could enable smaller municipalities in applying a simplified system. There is also concern that asset management plans are not linked to finance and hence the importance of integrating the plan with infrastructure investment analysis is recognised.

Infrastructure investment analysis

Infrastructure investment analysis (or plan) is a project of 10–20 years to align service delivery with operating and capital budgets to ensure that resulting services are viable. It provides a link between a service provision programme, the capital and operating costs associated with the programme, and the financing of both capital works and operating activity. Ultimately, it is a long-term assessment of the viability of infrastructure systems. It is an important part of planning and strongly promoted by the DBSA and other funding agencies. There are existing financial modelling tools and guidelines on how to do the analysis that have been promoted by NT, COGTA and the DBSA. Yet, it is often ignored or underdeveloped.

Figure 3: Municipal Planning Framework

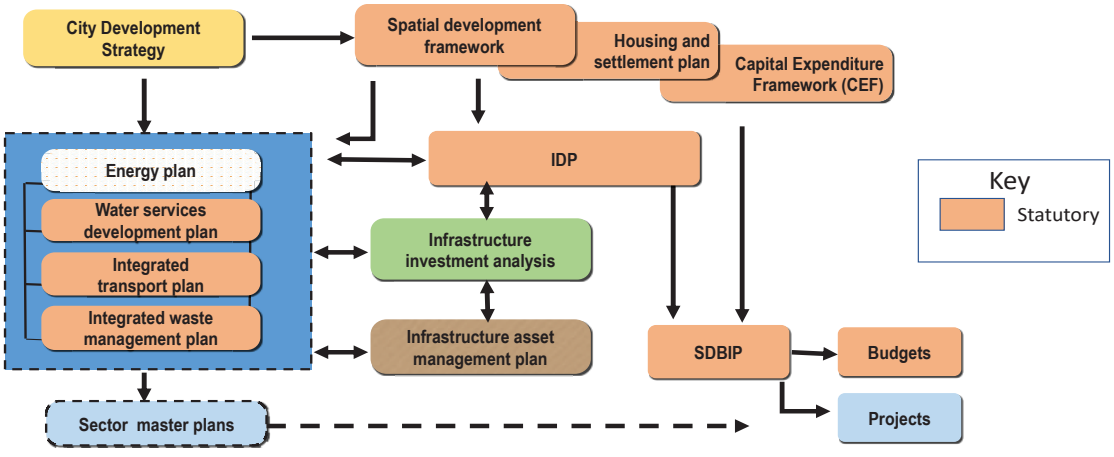
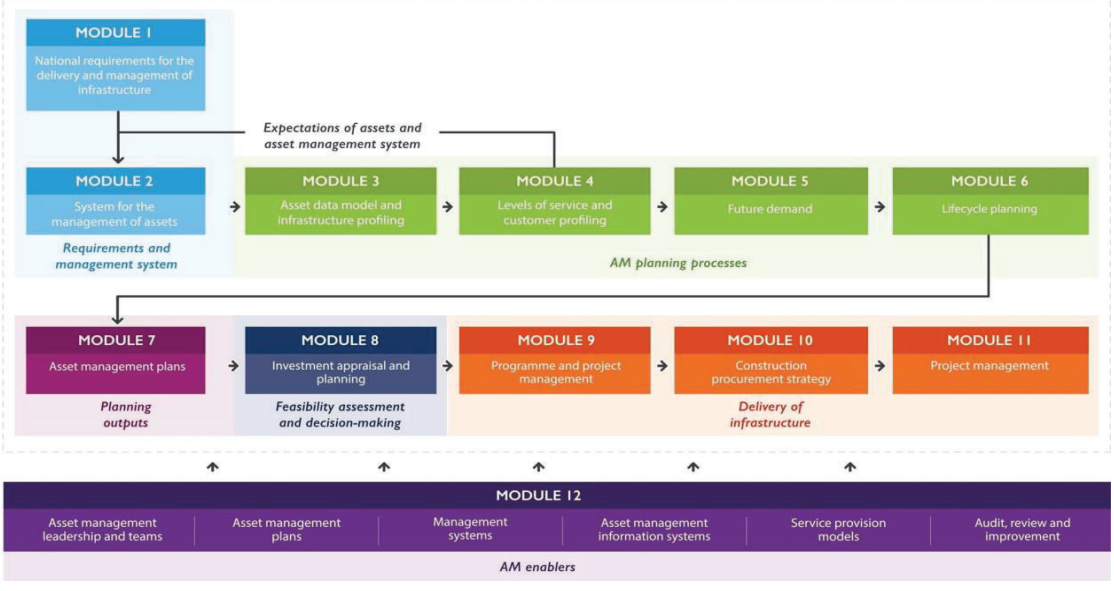


Figure 4: Asset management CIDMS toolkit



Source: CIDMS Toolkit, City Support Programme, National Treasury www.CIDMS.co.za

3.3.1.3 Conditions required to ensure infrastructure planning supports South Africa's 2050 vision

Three conditions are essential to ensure there is a robust and well-functioning planning system for distributed infrastructure:

1. Infrastructure planning must be integrated vertically across spheres and tiers of government and horizontally across provinces and municipalities.
2. Planning for infrastructure must be informed by spatial planning priorities and by financial factors.
3. Social accountability and engagement practices in infrastructure planning must be robust.

3.3.1.4 How planning will support the NIP 2050 vision

Strategic element	2050 vision – How it will be done
Infrastructure planning is integrated vertically and horizontally.	• National departments will not be involved in introducing new sub-national planning requirements. • Provinces will step back from planning human settlements and public transport in metros and will focus their attention on other, more needy municipalities. • The DDM will be rolled out, and must focus on only planning coordination and alignment. • Requirements for statutory plans used by smaller municipalities will be simplified and plausibly implemented.
Planning for infrastructure is informed by spatial planning priorities and by financial factors.	• An infrastructure investment analysis will be carried out for all metros, intermediate cities and C2 districts, with a simplified methodology developed for smaller municipalities. • Provinces will have strong oversight of demographic and economic growth projections (in Municipal Spatial Development Frameworks - MSDFs), which must be consistent across municipal sectors.
Social accountability and engagement practices are robust.	A toolkit and platform for documenting social accountability practices in infrastructure planning and sharing them, such as NT's InTAcT project (www.intact.org.za), will be supported.
Sector-specific actions	Rural roads planning will be rationalised with clear institutional responsibilities and plans owned by the authority owning the roads.
Three-year actions	• The DDM will be implemented, with a focus on planning and avoiding the establishment of an administration parallel to that of local government. • COGTA, cooperating with NT, will develop a single asset management guideline that recognises the differential capacity of municipalities. • Infrastructure investment analysis will be introduced, based on DBSA guidelines, for all municipalities under the DDM umbrella. • The Municipal Structures Act, No 117 of 1998, will be amended to devolve human settlements and public transport planning from provinces to metros, commencing with the five largest metros.
Implications for SIPS	• SIP7 is supported by the above recommendations: 'Integrated urban space and public transport programme' has a strong emphasis on planning: 'Coordinate planning and implementation of public transport, human settlement, economic and social infrastructure and location decisions into sustainable urban settlements connected by densified transport corridors. This will focus on the 12 largest urban centres of the country, including all the metros in South Africa. Significant work is underway on urban transport integration'. However, SIP 7 applies to metros and larger secondary cities only.

3.3.2 Delivery management

3.3.2.1 Vision for distributed infrastructure delivery institutions

By 2050 there will be confidence in the integrity of government systems and capacity of institutions to deliver the required infrastructure and associated services while ensuring value for money and social accountability. Government will be organised in a way that enables

efficient and effective infrastructure delivery. There will be robust technically capability and an ability to mobilise capacity from business and civil society where appropriate.

3.3.2.2 Status of institutions responsible for distributed infrastructure delivery in 2022

Provincial domain

- **Roads:** Provinces are responsible for 36% of proclaimed roads, which are mostly currently rated as being in 'fair' condition. Unproclaimed roads are mostly rural and are not recorded in any inventory, and there is no government entity responsible for them.
- **Public transport:** 'Public transport' is a provincial function and 'municipal public transport' is a local government function. Coordination of national, provincial and municipal functions within metropolitan areas is a concern: the metros argue for the assignment of the public transport function to them.
- **Human settlements:** There are overlapping functions between provinces and cities, with housing identified as a provincial competence while practically municipalities are responsible for developing land, including the provision of services. While the Housing Act, No 107 of 1997, provides for the accreditation of certain municipalities to administer national housing programmes, this has not been applied successfully and it is necessary for the housing function to be assigned to competent metros in terms of the Municipal Structures Act.
- **Education and health facilities:** Good coordination between the custodian of the service (Public Works) and user (Education or Health) is necessary. While this is problematic in some provinces, it is generally improving. The poor state of services at schools and clinics is a concern, particularly in rural areas, with sanitation receiving the most adverse comment. This is partly due to inadequate performance of municipalities. While PHC is a provincial competence, primary healthcare facilities are provided by some municipalities, mainly metros. This is often not matched with transfer of funds from provinces and is a source of conflict.
- **There is a critical need to improve provincial support and regulation of local government.** Regulation refers to the development and publication of norms and standards, the institution of a monitoring and supervision systems for oversight of performance with respect to norms and standards, and the use of incentives and penalties in response. The provincial role in regulating governance arrangements in municipalities is crucial and includes oversight of section 139 interventions. Provinces also have responsibility to support municipalities, with governance arrangements being paramount. Yet the poor state of governance in the majority of municipalities is partly related to poor support. Technical (infrastructure-related) support from provinces is typically weak.

Local government

While the Constitution creates three categories of municipalities (A: stand-alone; B: lower tier in a two-tier system; C: higher tier in two tier system), it is the Municipal Structures Act that assigns types of municipalities (A: metropolitan municipalities; B: local municipalities; C: district municipalities). These effectively make all eight currently designated metros stand-alone municipalities. Elsewhere in the country citizens are governed by two tiers of municipalities: a local municipality that is located within the boundaries of a larger district municipality. We currently have wall-to-wall local municipalities, meaning that outside metropolitan municipalities every district municipality shares its boundary with the aggregate boundary of a fixed set of local municipalities.

Table 4: Municipalities – differentiated structure and access to water

Category	% population provided with water and sanitation	% distressed	No access to piped water	Water interruptions > 2 days
A Metros (8)	42%	No data	2%	13%
B Intermediate cities (39)	20%	33%	4%	24%
B Small towns and rural LMs (166)	13%	35%	6%	30%
C2 Rural districts with service provider role (21)	25%	52%	23%	54%

Notes:
- All figures are from 2018–2021 data.
- Not included here are 23 'C1' municipalities that are not responsible for infrastructure-intensive services.
- Percentages of distressed municipalities are based on the CoGTA and NT 2018 assessment.
- Data on access to piped water and interruptions derives from Stats SA community surveys.
- Figures for access to piped water are indicated for only local municipalities that are water service authorities.

Two-tier local government – the role of districts

- By international standards, South Africa has few local municipalities and too many districts.
- ANC policy and national government policy proposals have identified the need for district reconfiguration, with proposals to create more single-tier municipalities (so-called A2s). This has not yet been implemented.
- The span of control of districts is too small (four local municipalities to a district, for example).
- Some districts, referred to as 'C2' districts, are water service authorities and have major service provision obligations. Almost without exception they perform poorly as service providers. They are overstaffed with junior personnel but seriously understaffed with engineering professionals.
- The others, 'C1' districts, have no direct service provision responsibility and have too little impact in relation to the funds they are allocated.

Water and sanitation

- The statutory responsibility for providing water and sanitation services (referred to as water services in the Water Services Act, No 108 of 1997) is split between districts and local municipalities through a process of authorisation under the Municipal Structures Act. No changes have been made to authorisations since 2001. Yet, there are sufficient concerns about the capacity of either district of local municipality to provide the service effectively to warrant a review of these authorisations.
- Water boards are currently mainly bulk water suppliers. There have been proposals put forward by the DWS to strengthen the role for water boards, to undertake retail services, selling water direct to consumers. Some water boards own and operate wastewater treatment works and there is a potential to expand this activity. But only a few have the capacity. There has been a consolidation of water boards in the past and DWS plans further consolidation. In addition, the DWS is planning to set up an independent water

regulator. Improvement in water infrastructure delivery could be found with a review of roles of LMs, districts and water boards. Water boards could have a greater role.

Electricity

- The Municipal Structures Act assigns electricity authority at the district level. However, in practice, with some minor exceptions, districts do not function as authority or provider. In many municipalities electricity distribution is split between Eskom and municipal supply. This creates inefficiencies, loss of revenue for the municipality and, in some cases, inequity from the point of view of customers. The electricity sector is changing, with new opportunities for generation by municipalities, with some already planning for their own renewable-energy supplies.
- There is a need for clarity in the allocation of authority to provide electricity.

Municipal roads

- The Municipal Structures Act assigns a roads function to district municipalities; however, with some minor exceptions, they do not provide roads. Regarding low-volume rural roads, responsibility for these roads is uncertain, split between provinces and local municipalities, with the quality of these roads typically being poor. Within the boundary of larger urban areas municipal, provincial and national (SANRAL) roads exist and typically there is a lack of coordination between spheres, specifically at interchanges. Metros argue for the devolution in some cases.
- Responsibilities for road build and maintenance needs to be clarified. In larger urban areas, there needs to be clarity on respective roles of SANRAL, provinces and municipalities. In other areas, the roads function should be assigned to local municipalities.

Human settlements and public transport

- There has been a trend away from subsidising the ‘top structure’ and a growing emphasis on land assembly, plus municipal service provision, as is currently the case with informal settlement upgrading. Outside the metros and secondary cities the role of provinces in developing human settlements cooperatively with municipalities remains important.
- Poor performance by PRASA has led to some metros seeking a devolution of the passenger rail function to them, which in turn would enable integration with other passenger transport modes.
- There must be increased devolution of human settlements and public transport. The devolution of human settlements and public transport functions to metros is proposed above in ‘provincial institutional arrangements’. Passenger rail should be devolved to enable metro oversight and multi-modal integration.

Capacity building of local government

- Provinces and national government have a constitutional obligation to support local government; however, they have not built their own capacity to deliver on this.
- Provinces have a key role to play and have been relatively successful with financial administration but not with governance and technical capacity. Provinces have very little engineering capability other than that required for their own roads, with the Western Cape being an exception.
- The Government Technical Advisory Centre (GTAC) in NT has offered some support in PPPs and could potentially play a larger role in the local government sphere. To date, it has had insufficient impact with a largely demand-responsive approach and limited forward-looking interventions. NT’s City Support Programme is an important intervention but not sufficiently scaled or resourced. The Intermediate City Support Programme (driven by CoGTA) and Regional Management Support Contracts programme (MISA) have stalled.

SALGA's Small Town Regeneration programme is not yet operating at a sufficient scale. MISA is a 'government component' falling under the auspices of CoGTA and has a key role to play but has not built up sufficient capacity and lacks senior professional engineers. The DWS withdrew from offering local government support in the late 2000s, but has recently begun to restore this support, yet it lacks technical (engineering) capacity internally to deliver on this. The DWS has expressed the intention to set up a project management office (PMO) under its National Water Programme with a strong municipal support component. This could be a significant intervention.

- Current support programmes are not operating with sufficient capacity and impact. The City Support Programme has been one of the more impactful support programmes, however not sufficiently resourced financially or technically. SALGA's Small Towns Programme has also been impactful but is not sufficiently scaled. The Intermediate City Support programme and Regional Management Support Contracts have stalled.
- There have been some successes with private sector interventions to support local government, with the support provided by the SAICE to professionalise municipalities being most notable.
- There is no capacity development strategy that, among other things, identifies interventions, responsibilities and funding arrangements for all role players.

The political–administrative interface

- The political–administrative interface is not sufficiently delineated in many municipalities. The experience of State Capture has led to high turnover and organisational volatility. State Capture was facilitated through the appointment process of senior managers (Zondo Commission). There is evidence of loyalty overriding competency of senior technical managers, which has led to system vulnerability. Most significantly, the procurement processes have been captured in too many places: this results in tender corruption and in some cases legitimately appointed service providers being plagued with post-appointment extortion. The testimony of the Chief Procurement Officer at the Zondo Commission stated that '50% of procurements in 2017 were improper'. This is further discussed in 3.2. The Procurement Bill is in process and is aimed at strengthening controls and providing one integrated legislative framework across all spheres and SOEs. The bill was tabled in 2020, but is still in a consultation process.
- Poor project outcomes are often explained by weakening professional and technical capacity in local government. For example, there are insufficient and falling numbers of water and sanitation engineering professionals in municipalities. This results in significant capital expenditure slippage, including that on infrastructure grants. Many infrastructure projects do not reach financial closure or achieve desired project outcomes due to poor capabilities and systems for project preparation; limited experience and systems for programme, portfolio and project management; limited focus on asset management and maintenance; and lack of an integrated approach to infrastructure planning, delivery and asset management. There are innovations in this regard with metropolitan municipalities implementing the CIDMS and Cape Town's Programme, Portfolio and Project Management (PPM) system, which has received international awards.

3.3.2.3 Conditions required to ensure institutions support South Africa's infrastructure vision

Alignment of mandates across spheres of government is essential to effective infrastructure delivery, relying on seven conditions for improved coordination to ensure this delivery:

1 The institutional framework must be clear and aligned with appropriate roles and mandates:

- National government must focus on regulation and its agents, specifically MISA, GTAC and DBSA must focus on support for municipalities.
- Provinces must progressively withdraw from functions in metros and strengthen their support for other municipalities, towns and rural areas particularly.
- District municipalities must no longer be required for secondary cities and many other municipalities in intermediate cities grouping.
- Districts must be reduced in number and those that are service providers (C2) need a large step-up in capability.

2 There must be a robust and high-impact capacity building programmes tailored to specific categories of local government.

3 There must be an asset management system for infrastructure throughout the life cycle.

4 There must be a high professional and technical standard of capability serving local government infrastructure build and maintenance.

5 The procurement system must be robust.

6 Conditions for private sector support and partnerships with local government must be optimised.

7 The structure and performance of SOEs that provide settlement-related services – specifically Eskom, water boards and PRASA – must be strong.

3.3.2.4 How governance will be strengthened to support the NIP 2050 vision

Strategic element	**2050 vision – How it will be done**
Institutions are optimised to ensure best possible service provision outcomes.	• The 2018 COGTA recommendations on reconfiguring district government will be implemented. Functions will be removed from districts where they are redundant (ie where they do not undertake them in practice) or where they should not undertake them: electricity reticulation, roads and minor services. • Electricity distribution responsibilities allocation between Eskom and municipalities will be made more functional to sustainable service delivery. • Water service authority authorisations will be clarified by DWS and COGTA. Water boards will be restructured and streamlined and given greater responsibility to support municipalities through renewing and expanding bulk infrastructure (including wastewater treatment works) and/or operating bulk and retail services. • The largest metros will be given full responsibility for human settlements and public transport. • Passenger rail responsibilities will be allocated to metros where determined appropriate in support of deepening service delivery and intermodal transport solutions. • The functional responsibility and financing of rural roads will be clarified with the aim of strengthening delivery.
There is meaningful capacity building for local government.	• **A national capacity-building strategy will be designed and implemented,** focused on roles of key institutions and covering financial aspects, with support and participation of COGTA, NT, line departments and SALGA. • The four large scale support programmes will be set up, implemented or strengthened:

Draft NIP 2050 Phase 2

Strategic element	2050 vision – How it will be done
	○ **Metros** – The City Support Programme (CSP) will be strengthened. ○ **Intermediate cities** – The recommendations of COGTA's report 'Support programme for intermediate city municipalities in South Africa' will be implemented and suitably financed. ○ **Towns and rural local municipalities** – MISA will set up and implement a towns and rural local municipalities support programme, learning from SALGA's current Small Town Regeneration programme. ○ **Rural districts** – The Rural Districts Support Programme will be reinstated and implemented under a new PPP support unit. (It currently exists in the form of an approved business plan for Regional Management Support Contracts and has been applied by MISA in three districts, without yet conforming to the business plan.)
There is an asset management system for the full life-cycle of infrastructure.	An integrated infrastructure delivery and management system that looks at the full life cycle of infrastructure (planning, procurement, construction, maintenance, operating and decommissioning) across all types of infrastructure will be established, with aligned training of built environment professionals. CIDMS must be implemented for all metropolitan municipalities. It should be customised for implementation in intermediate cities, towns and rural local municipalities and rural districts.
There is a high standard of professional and technical capability for local infrastructure. delivery	Professional senior managers will be appointed through well-defined political administrative interface that insulate them from undue influence. An independent body or commission will be appointed to safeguard professional appointments and mediate in disputes with respect to senior municipal managers – eg Local Government Commission.
The procurement system is robust.	The procurement system will be made robust in protecting value for money, while encouraging innovation and the achievement of outcomes and impacts. Procurement will be treated as a strategic process and not a financial administrative process (NIP1). It will rely on a transparent, open and socially accountable infrastructure delivery system, including open procurement and open contracting system, as committed to in South Africa's Open Governance Partnership commitments (2021).
Municipal public–private partnerships and alliances are enabled.	Municipal PPPs and alliances will be strengthened with streamlined regulations, role clarification, and capacity development, drawing in local and international partners for technical assistance and financial partnerships.
Three-year view	• A national local government capacity-building programme will be finalised and funded by 2023/4. It will attend to the different needs of metros, intermediate cities, towns and rural local municipalities, and rural districts. • The NIP 2050 Phase 1 requires that capacity building in respect of maintenance and billing systems be treated as a top priority. The initial focus of the NIP 2050 municipal capacity development for infrastructure delivery will focus on the 17 non-delegated municipalities for which NT has oversight. This includes the eight metros, the 10 largest secondary cities and one district municipality. They account for 71% of local government spending power. This approach will enable

Draft NIP 2050 Phase 2

Strategic element	2050 vision – How it will be done
	more opportunity for performance-based support programmes, and will leverage NT's broader capacity development efforts in municipal budgeting and financial management. • An integrated infrastructure delivery system will be scoped and established by 2024/5. It will include the CIDMS in metros and a customisation of this system to other types of municipalities (intermediate cities, small towns and rural areas, and rural districts). • A process will be initiated to implement the proposed 2018 COGTA recommendations on reconfiguring district government. This will be separated from the DDM as this initiative is not suited to deal with institutional reform. The COGTA process to amend powers and functions of district municipalities will be concluded. The current process to review section 84 of the Municipal Structures Act will be concluded. • A review of water board structures and responsibilities will be completed by 2023/4. Water service authority authorisations will be reviewed through a national process overseen cooperatively by COGTA and DWS. Key to success will be agreement between stakeholders on criteria for authorisation. • The allocation of responsibility for electricity distribution between Eskom and municipalities will be reviewed and made more suited to sustained service delivery by 2023/4. The role of Eskom as a distributor in municipalities where the municipality is the dominant distributor currently will be reviewed. • The PRASA restructuring process will engage with metros to assess and agree on devolution to metros or at least a regionalisation of PRASA operations. • A national geographic database of all roads will be established, including unproclaimed roads, completed and followed with identification of institutional responsibility for all roads. • Housing and land transport legislation will be reviewed to give the largest metros full responsibility for human settlements and public transport. There will be three interdepartmental projects to devolve human settlements, public transport and health functions to competent metros. • A full review of functional responsibility and financing of rural roads will be done by 2023/4. • Support for municipal PPPs and alliances will be strengthened with streamlined regulations, role clarification (GTAC, MISA, DWS PMO) and capacity developed by 2024/5. • NT will reform infrastructure grants by 2023/4, to be determined by infrastructure need, capability (including professional capability) and performance. • The NIP 2050 Phase 1 requires that a subset of the non-delegated municipalities be earmarked for capacity support in relation to performance in their electricity and water and sanitation business. Those that show political commitment will be incentivised and provided with support for the professionalisation of the service (management and technical capability), with sound and protected governance, and finance linked with performance improvements. This is an intervention that the City Support Programme in NT has tested and is developing further. Turnarounds will be linked to financial incentives (grants or private) that are conditional on improved institutional and operational performance.

Strategic element	2050 vision – How it will be done

	• National Treasury will:
	  ○ review the Procurement Bill to strengthen transparency and social accountability;
	  ○ review the FIPDM to strengthen transparency and social accountability; and
	  ○ implement the recommendations of the Construction Sector Transparency Report (2021) relating to open procurement and open contracting already committed to in South Africa's Open Governance Action Plan (2021).
	• CoGTA will review competency standards for infrastructure management and delivery. CoGTA will investigate an independent commission to support municipalities in safeguarding the integrity of appointments as well as retention and exits of senior local government management.

3.3.3 Monitoring and evaluation

Scope

Monitoring, reporting and evaluation (MRE) of infrastructure is a critical activity to ensure accountability, effective delivery and continuous improvement and adaptation. The National Infrastructure Plan 2050 Phase 1, Chapter 7, approved by Cabinet in March 2022, outlines the intended approach to monitoring, reporting and evaluating infrastructure delivery. This section below focuses on MRE as it pertains to distributed infrastructure specifically. The projects tend to be smaller than found in bulk infrastructure, and have more complex accountabilities. The principles and approaches found in NIP 2050 Phase 1 apply. However, there must be more depth in MRE for distributed infrastructure given its delivery complexity and heightened impact at the user interface.

3.3.3.1 Vision

MRE of distributed infrastructure will become regularised, systematised, useful and transparent.

3.3.3.2 Status of monitoring, reporting and evaluation

As indicated in the NIP 2050 Phase 1, MRE in infrastructure tends to be used for compliance purposes, and less for an elevated role offering evaluative insight for learning, early warning and efficient resource allocation.

Reporting is insufficient for purposes of compliance and accountability. It therefore is also not sufficient for capital and human resource planning, design, delivery management and course correction.

For example, no Construction Industry Development Board data has been made publicly available despite a register being in existence since 2004. There is limited public information available on the 18 SIPs gazetted in terms of Schedule 3 of the Infrastructure Development Act, No 23 of 2014, and SIPs gazetted since then.

Municipal and built environment planning instruments have not been sufficiently strategic, integrated and reflective of desired outcomes. A 2015 study found that metros were reporting 2572 indicators to national government, mostly in relation to inputs and process and activity compliance. There is weak coordination between the responsible sector departments with policy responsibilities. There is a redundancy and duplication of efforts that occurs across departments, layering reporting request upon reporting request without commensurate use, feedback or insight generated from the data supplied. Indicators at output and outcome level

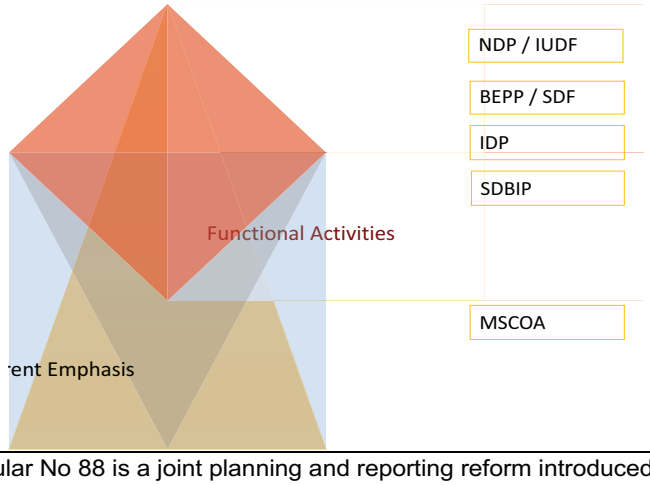
are underdeveloped and should be the focus of built environment reporting reforms. Technology and data are not sufficiently used as an enabler and contributor in achieving efficiencies in the reporting and dissemination of data.

There is limited use of evaluations practice and the tools it has to offer for evidence-based infrastructure delivery. Evaluations tools such as diagnostic, design, economic (cost-benefit), implementation and impact evaluations hold huge, yet unrealised value, in respective parts of the infrastructure project and programme cycle.

There have been positive efforts to improve MRE in Infrastructure. In particular at provincial level, the Infrastructure Reporting Model (IRM) was developed as a standardised infrastructure project monitoring tool, linked to conditional grant allocations in the Division of Revenue Act. Integration of infrastructure project management systems into departmental M&E systems was a key objective of the IRM. A web-based, real-time provision (within 22 days of the end of the month) on a quarterly basis has been a design feature of the IRM, which now serves as a central database of infrastructure project information. Knowledge management and an infrastructure delivery management support toolkit is meant to be central to building and sustaining capacity, including as it relates to the MRE provisions of the system. It was the intention to institutionalise the IDMS and include it within a M&E framework for infrastructure delivery, particularly as it relates to determinations of system maturity and results. However, this has not yet materialised.

At the municipal level, MRE reforms initiated in metropolitan municipalities for the built environment have been expanded to the rest of local government through a rationalised and standardised set of indicators for performance monitoring and reporting. Steps to ensure integration and alignment between infrastructure delivery reporting and local government performance are currently underway. Ensuring standardisation and integration of performance reporting from infrastructure delivery projects is a building block for wider intergovernmental performance monitoring and reporting integration, data sharing and transmission.

Figure 5: The built environment reporting status quo (2015)



MFMA Circular No 88 is a joint planning and reporting reform introduced to metropolitan municipalities in 2017 for implementation from 2018/19 onwards. The reform has advanced the alignment of local government planning and reporting instruments for a set of municipal performance indicators. It has entailed the review, rationalisation and standardisation of a set of indicators for local government in collaboration with relevant sector departments, state entities and municipalities. The reform draws on official government statistics and performance information generated across the state for quarterly and annual performance monitoring and reporting for a commonly defined set of output and outcome indicators. In 2020, it was further expanded to the remainder of local government for rollout in 2021/22 and has been incorporated as part of the Integrated Monitoring & Evaluation Framework of the DDM.

Among the achievements of the reform is that it is the first MFMA circular jointly signed off and periodically updated by the NT, COGTA and DPME, distinguishing it in terms of a coordinated and coherent approach among the centre of government departments. It has resulted in the consolidation of previous reporting by municipalities required by the NT, COGTA and DHS, together with other relevant sectoral departments, into a single reporting submission. The initiative has achieved efficiencies in data monitoring and reporting via a shared online reporting portal for metropolitan municipalities and quarterly reporting on the indicators has now become institutionalised. The rollout to the remainder of local government is underway with progressive efforts to support and assist provincial COGTAs to manage the submission of municipalities and oversee improvements in data supply. As municipalities improve their reporting, the intention is to regulate the reform in terms of an update to the Planning & Performance Management Regulations issued in terms of section 43 of the Municipal Systems Act.

3.3.3.3 Conditions for success

1 **Coordination of infrastructure MRE must be integrated within a governmentwide M&E system (GWMES).** There must be effective vertical and horizontal cooperation across spheres of government, and between departments and entities in MRE, with a centralised projects database. Especially in distributed infrastructure there must be integration and roll-up reporting from the level of project to programme to sector to national results in line with the NDP.

2 **Systematic planning, budgeting and MRE reforms for built environment must be institutionalised:**

- The strengthening, reinforcing and advancing of existing reforms such as MFMA Circular No 88 and the DDM must contribute to better infrastructure MRE.
- The three spheres of government must formalise definitions and standards for performance indicators *across government*.
- The relationship between what can be planned, monitored and reported and what should be determined through evaluation must be recognised during the design of infrastructure programmes and projects.
- Data and information management must be clarified for use in government and in the public domain.

3 **Evaluations must be integrated into the infrastructure planning life cycle:**

- At the stage of infrastructure project conceptualisation and feasibility, evaluative tools like multi-criteria decision-making models must feature in the consideration of different infrastructure trajectories.
- Clarificatory and design evaluations must be undertaken as part of infrastructure programme and project planning, leading the project pipeline ahead of actual execution.
- Making explicit the causal logic of infrastructure interventions, including the enablers, conditions and assumptions that are required to achieve desired outcomes, must contribute to their realisation and progress.
- Incorporating evaluation resourcing into the planning of infrastructure projects at key stages must contribute to strategic infrastructure projects being holistic in their consideration of results.

4 **Evaluation capacity must be decentralised, mainstreamed and resourced:**

- The evaluation capacity must be consistent with the National Evaluation Policy Framework, 2019.

- There must be strong capacity to develop and execute departmental evaluation plans, provincial evaluations plans, and municipal evaluation plans.
- There must be capacity to make interlinkages and achieve line of sight between long-term strategic planning (NDPs and One Plans), medium-term strategic planning (MTSF, Strategic Plans or IDPs, and built environment performance plans) and short-term planning (APPs and evaluation plans).
- Evaluation capacity requirements must be incorporated in the scoping and tendering of infrastructure projects and funds.
- There must be robust support for undertaking evaluations institutionally (via DDM) in relation to sectoral programmes (eg water and sanitation, or public transport) and at a project level.
- Infrastructure grants must be reviewed regularly to ensure there is adequate funding and conditionality for MRE.
- MRE must enable continuous improvement as indicated in the National Evaluation Policy Framework, 2019. It must demonstrably be used to improve performance through learning, improve accountability, generate knowledge and positively influence decision-making and resource allocation.

5 Infrastructure information must be publicly accessible, transparent and empower oversight of citizens and communities:

- There must be periodic indicator reporting and evaluations, and a strategic infrastructure database must be available and open to government and external stakeholders.
- Publicly accessible information must be available from a centralised open access portal or repository.
- Civil society, academia and the public must be enabled to access, engage and utilise this information within their local context as part of planning and accountability cycles.

3.3.3.4 How monitoring, reporting and evaluation will be done

Strategic element	**How it will be done, all in three years**
Coordination of Infrastructure MRE is integrated within the GWMES.	• ISA will engage with DPME, NT and CoGTA to integrate infrastructure reporting requirements into the GWMES, as well as complement Circular 88 reporting on the built environment. • ISA should consider joining NT, CoGTA and DPME in the coordination of these reforms.
Systematic planning, budgeting, monitoring, reporting and evaluation reforms for built environment are institutionalised.	• Systems will be integrated with sharing between infrastructure and programme streams. • NT is to ensure that the Infrastructure Reporting Model, with common procurement and delivery management standards, is to supply standardised data on infrastructure projects to a central, technologically enabled platform. • A database of network infrastructure projects will be established by ISA by 2023. • Data will be published from ISA's central infrastructure project repository so that data can be monitored and reviewed locally.

	• Reforms will be reinforced with related policy objectives and implications such as in respect of the DDM, MFMA Circular No 88 and municipal standard chart of accounts (mSCOA). • By 2025 infrastructure planning and budgeting should benefit from improved data and evidence. • Strategic infrastructure planning will be updated and integrated in terms of related planning instruments. The SIPs will have standardised reporting provisions, with appropriate information put into public domain. This is to be done by ISA.
Evaluation capacity must be decentralised, mainstreamed and resourced.	• By 2024, DPME, MISA, CoGTA, NT and ISA will adopt an integrated approach to evaluation capacity for infrastructure projects and programmes. • By 2023 NT will review infrastructure grant frameworks to recognise and incentivise performance as well as resource monitoring and evaluation practice, tools and systems from infrastructure grants.
Infrastructure information is publicly accessible and transparent, and empowers oversight of citizens and communities.	• Infrastructure evaluations will be openly published by DPME. • From 2023 data from the project database will be made available online and ISA will actively disseminate the data within and outside of government, empowering users.
This NIP must be monitored and evaluated.	A monitoring and evaluation framework will be developed in 2022 and implemented thereafter by ISA and responsible entities, with respect to this NIP.