



5



infrastructure

5.1 WHAT DEMOCRATIC SOUTH AFRICA INHERITED IN 1994

Infrastructure expenditure during the apartheid years was relatively high as a percentage of GDP. The apartheid state made excessive investments in infrastructure that served mainly the white minority and maintained the apartheid state. In making these choices, consumption expenditure on education, healthcare, housing, municipal services and welfare for the majority of the population was sacrificed to facilitate the development of infrastructure for a privileged minority, an extractive economy and a security state. These poor fiscal choices contributed to the poverty and inequality subsequently faced by the democratic state, and which are still being addressed today.

Figure 5.1 shows that public investment peaked in 1976. This was followed by a decline up to 1994, after which it gradually began to increase. During the period of decline, poor fiscal choices were again made against infrastructure development as public funds were increasingly channelled towards reinforcing the security of the apartheid state, in response to growing resistance.

Thus, while capital expenditure as a percentage of GDP peaked higher during the apartheid years than in the 20 years of democracy, the resulting GDP growth produced by the investment in infrastructure was comparatively lower, and the social infrastructure inherited by the democratic government was generally in a poor shape, poorly located, under-maintained and ill-equipped to serve a modern, changing economy. The sharp fall in investment post-1976 meant that the state of infrastructure could not support faster economic growth or growth that was more diversified, as was to be generated in the democratic era.

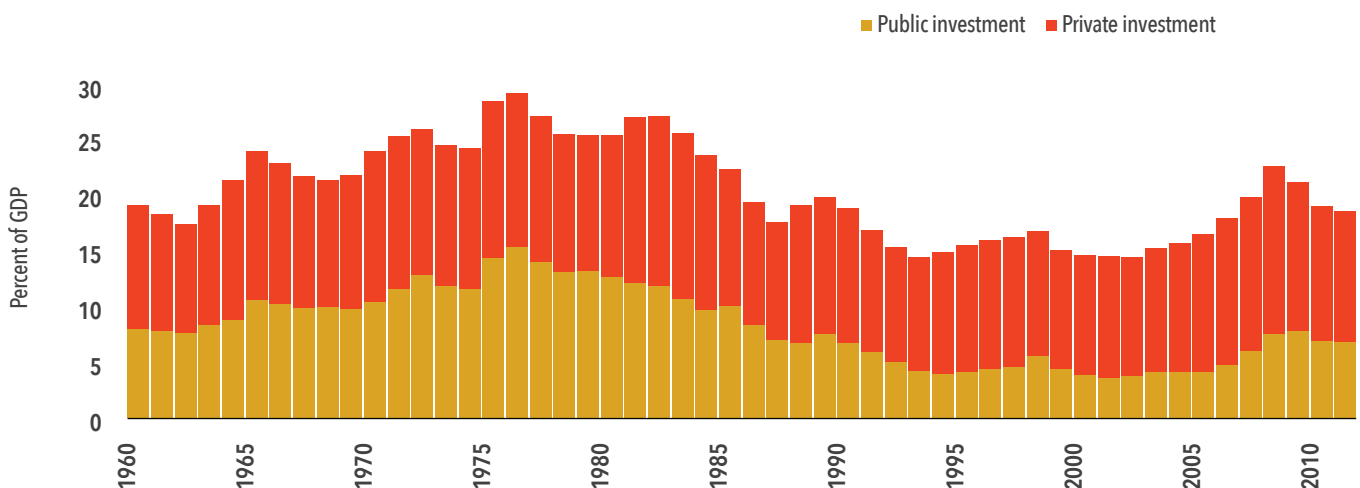
The democratic government inherited a severe shortage of housing that had been exacerbated by forced removals, group areas and homeland policy, and many households did not have access to clean running water and electricity. A significant portion of fixed investment had gone into reinforcing apartheid's spatial divides.

5.2 DEVELOPMENTS SINCE 1994

The new democratic government set about reversing the declining post-1976 investment trend, correcting the imbalances in the infrastructure sector, and embarking on reconstruction and development. During the post-1994 period up to the early 2000s, government focused on increasing access to social and household infrastructure through the provision of housing, schooling and healthcare, and connecting households to electricity grids and water networks. Other expenditure was aimed at improving the welfare of households. The fiscal choices made contributed to subsequent GDP growth rates, as well as wider income distribution, improved welfare and standards of living, as well as greater utilisation of bulk economic infrastructure by all.

The rapidly growing economy, growing prosperity and growing utilisation of infrastructure by many more people than the infrastructure was designed for were resulting in new demands for road, rail, port, water, electricity and telecommunications infrastructure. There was a need for greater economic infrastructure investment, while still continuing to address apartheid-era backlogs in housing and social infrastructure. This led to an increased focus on economic infrastructure from the mid 2000s, encapsulated in the 2006 Accelerated and Shared Growth Initiative (AsgiSA).

Figure 5.1: Public and private-sector capital investment as a share of GDP, 1960–2010



Source: South African Reserve Bank (SARB), as cited in 2012 Budget Review

SOCIAL INFRASTRUCTURE DELIVERY IN THE FIRST DECADE

By 2004, an estimated 1.6 million subsidised houses had been built. About 56 000 new classrooms and 38 000 school toilets had been built, with 2 700 more schools receiving potable water and about 4 000 more schools had been connected to electricity. Health services had reached new areas, with the construction of over 700 new clinics, the upgrading of an additional 212 clinics, the purchase of 215 mobile clinics, and the re-equipping of 2 298 clinics. Three new modern tertiary hospitals with over 2 000 beds had been constructed under the Hospital Rehabilitation and Reconstruction Programme, and R1.6 billion had been spent on 492 projects to improve 141 hospitals. Government had provided a basic water supply to over 9 million more people, access to basic sanitation to 6.4 million more people, and about 4 million more electricity connections had been made to poor households.

Source: National Treasury: Budget Review 2004

SOCIAL INFRASTRUCTURE HIGHLIGHTS OVER THE PAST 20 YEARS

- In basic education facilities, 84 468 new classrooms and 21 774 ablution facilities have been built. 8 765 schools have been provided with water and 6 434 schools have been provided with electrical connections. Some 2 761 new schools have been constructed.
- More than 1 500 healthcare facilities have been built and existing ones revitalised to ensure that everyone can access healthcare within a 5km radius of their home.
- Eighteen new hospitals have been built and more than half of the 400 public hospitals in South Africa have been renovated.
- Some 3.7 million subsidised housing opportunities (including houses and serviced sites) have been provided to the very poor, giving a home to about 12.5 million people.
- Access to a basic level of sanitation increased from just over 50 percent of households in 1994/95 to 83 percent in 2011/12.
- Access to a basic level of clean water increased from just over 60 percent of households in 1994/95 to over 95 percent in 2011/12.
- Access to electricity increased from just over 50 percent of households in 1994/95 to 86 percent in 2013/14.

Sources: Departments of Basic Education, Health, Human Settlements, Water Affairs and Energy, and Statistics South Africa.

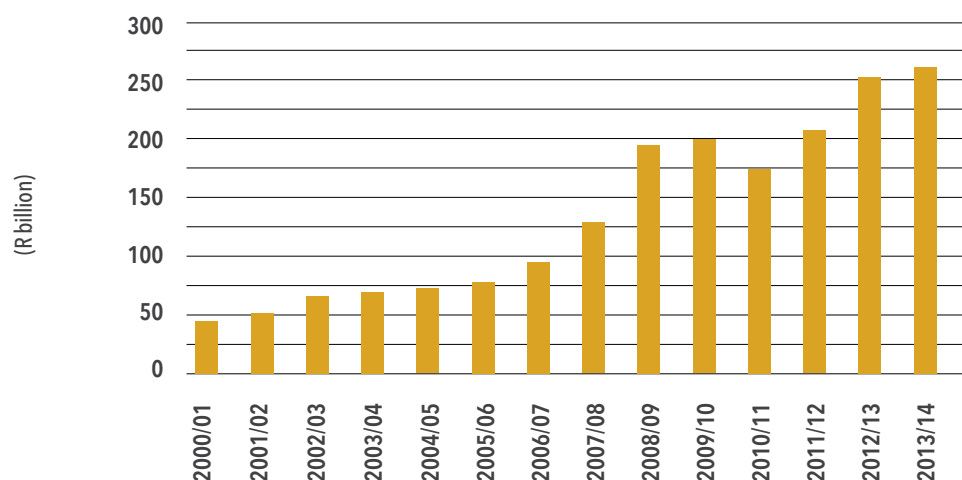
Based on the experience of delivering infrastructure in the early years of democracy, important steps were taken to improve infrastructure planning and delivery. The Public Finance Management Act was passed in 1999 and three-year rolling medium-term expenditure framework (MTEF) budgeting

was introduced, enabling multi-year project planning and expenditure. There was an increased focus on budgeting for infrastructure projects and programmes by national government, and large new infrastructure grants to the provincial and local spheres of government were introduced. At the same time, important institutions, like the Construction Industry Development Board (CIDB), were formed. The CIDB, empowered by Treasury Regulations, produced frameworks and initiatives that helped improve public sector management of infrastructure construction and maintenance. Many initiatives focused on assisting provinces and municipalities to improve their infrastructure planning and delivery.

While there are some variations in the expenditure performance of the public sector as a whole, it is clear that expenditure levels increased over the last few years due to the increased focus on improving infrastructure delivery. Between 2009/10 and 2012/13, general government infrastructure spending averaged 82 percent (of budget) while non-financial public enterprises (NFPE) spending averaged 78 percent during the same period. NFPE spending increased from 60 percent in 2010/11 to 86 percent in 2012/13, with Eskom, Transnet, CEF, South African National Roads Agency Limited and Passenger Rail Agency of South Africa together spending R104.6 billion. Municipal spending performance improved from 72 percent in 2006/07 to 85 percent in 2008/09 before declining to 75 percent in 2011/12¹.

Figure 5.2 indicates that public sector investment in infrastructure has increased markedly since 2000/01. High levels of investment in infrastructure will continue into the foreseeable future as infrastructure development is central to the NDP. The NDP encapsulates the role of infrastructure sectors towards achieving a common 2030 vision for the construction of South Africa's future. The establishment of the Presidential Infrastructure Coordinating Commission (PICC), which has brought all spheres of government together in a joint forum, has set out a National Infrastructure Plan, giving effect and detail to the NDP mandate on infrastructure.

Infrastructure expenditure is estimated at around R847 billion over the three-year

Figure 5.2: Public-sector infrastructure expenditure estimates, 2000/01–2013/14

Source: National Treasury Budget Reviews (2003–2013)

medium term expenditure framework (MTEF)². Investment in transport and logistics (41 percent) remains the largest component of the public-infrastructure programme, followed by energy (22.2 percent), and water and sanitation (13.2 percent). Spending on social services such as health, education and social development make up 13.7 percent of public sector infrastructure expenditure and central government and administrative services are budgeted to spend 2.7 percent over the MTEF on infrastructure.

5.3 SECTORS

Public sector infrastructure delivery involves many different implementing spheres of government – national, provincial and local, as well as their agencies and entities, including the large state owned enterprises such as Eskom and Transnet, which are key players in many sectors. There is also a private sector contribution to the built environment, including factories and industry in general, commercial infrastructure, office space, etc., much of which relies on, and is facilitated by, the existence of public sector infrastructure.

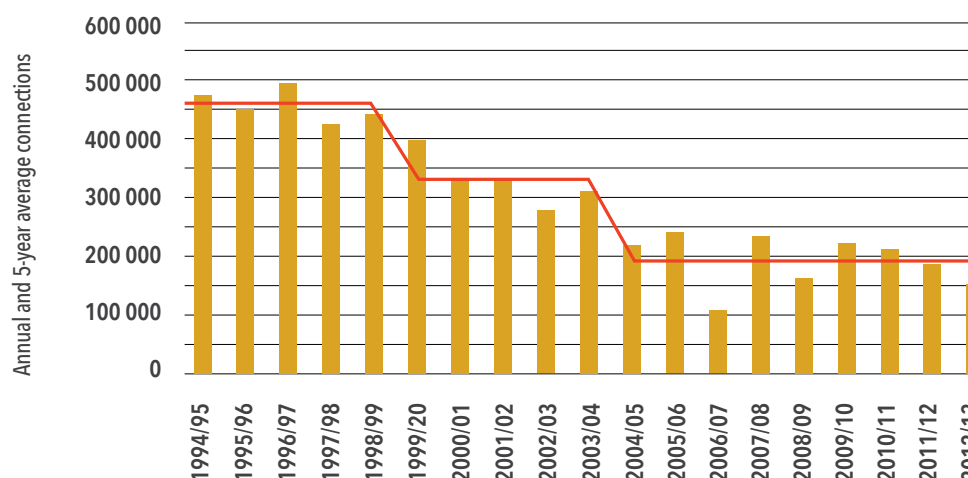
Important improvements have been made in the key infrastructure sectors of electricity, transport, water and communications, as well as in industrial development zone infrastructure, social infrastructure grants and public-private partnership (PPP) projects, as will be discussed below.

5.3.1 Electricity

In less than 20 years, the democratic state has provided access to electricity to over 5.8 million poor households. The electrification programme – which is rolled out by Eskom and municipalities and administered by the Department of Energy – has reduced the percentage of households without electricity to 14 percent⁴ (from approximately 50 percent in 1994). The programme is ongoing, albeit at a slower pace than in the late 1990s as new connections depend on bulk infrastructure and network extensions being made to enable household connections in the more remote areas, increasing the costs per household connection, as well as the resourcing requirements.

The democratic government inherited a modern electricity generation fleet that was largely fuelled by coal and able to deliver electricity at low prices by international standards. Consequently, between 1994 and 2002, comparatively little investment was made in electricity generation, given the low economic growth rates of the past. However, the unprecedented rapid post-apartheid growth of the economy defied decades-old planning expectations in the sector, and demand rapidly exceeded supply (compounded by pre-1994 decisions to mothball power stations), resulting in a supply crisis in early 2008.

Figure 5.3: Combined Eskom and municipal Electrification Programme connections



Source: Department of Energy⁵

POLICY AND INSTITUTIONAL REFORMS IN THE ELECTRICITY SECTOR SINCE 1994

Major policy and institutional reforms in South Africa's electricity landscape after 1994 include:

- Establishing the Atomic Energy Corporation's plant at Phelindaba in 1995.
- Publishing the *White Paper on Energy Policy* in 1998.
- Transforming Eskom into a public company, Eskom Holdings, in 2002.
- Publishing the *White Paper on Renewable Energy* in 2003.
- Promulgating the National Energy Regulator Act in 2004 and establishing the National Energy Regulator of South Africa in 2005.
- Publishing the Integrated Resource Plan for electricity in 2010.
- Publishing renewable energy feed-in tariffs in 2009.
- Launching a bid process for renewable energy supply in 2011/12.
- The ISMO Bill, which will establish an independent system operator, has been drafted and is awaiting Parliamentary approval.

Source: State of SA Economic Infrastructure Report 2012⁶

4500MW generation capacity, are currently under construction (Medupi, which is currently 56 percent complete, and Kusile, which is 24 percent complete), as well as a pumped storage scheme (Ingula, which is currently 65 percent complete)⁸.

During the current administration, government invited the private sector to bid for contracts to supply the national grid with renewable energy in terms of the Integrated Resource Plan (IRP) 2010. Three rounds of bidding have been completed, and Power Purchase Agreements for 1442MW of renewable energy were signed in November 2012. Agreements were also signed for 1043MW of renewable energy in May 2013 and 1456MW of renewable energy in November 2013⁹.

Since 2005, 4 965km of transmission lines have been installed. This translates to 23 815MVA of additional transmission capacity¹⁰. The major drivers of transmission investments have been network links to unserved areas to enable household connections, economic growth and security of supply (to the Cape and other internal regions far from coalfields and power stations), and access to generation capacity outside South Africa. Despite the large number of transmission network improvements, more will be required in future to enable larger numbers of electricity connections to unelectrified households, and to unlock economic growth in undeveloped regions. This is being addressed within the National Infrastructure Plan of the Presidential Infrastructure Coordinating Commission.

Since 2005, 6 028 MW of additional capacity has been added to the national grid by upgrading existing stations, returning mothballed stations to service and building new generating plants⁷. Despite this progress, demand has exceeded supply since early 2008. In order to increase the generation of electricity and open up the economy to large investors, two new large coal-fired power stations, each in excess of

5.3.2 Transport

Before 1994, transport was not managed in a holistic way. Racially segregated town planning, which saw black people being allocated land far away from business centres, coupled with poor transport infrastructure, meant that most South Africans did not have easy access to economic opportunities or social spaces and services. Since the pass laws have been abolished, new settlements have been built closer to cities, and freedom of movement prevails. However, apartheid-era spatial patterns are difficult and costly to dismantle overnight. Much therefore still needs to be done to improve public transport subsidies and systems, as well as to improve social spaces and amenities in existing dormitory townships. In addition, there will be an ongoing focus on attempts to locate new housing developments closer to work opportunities.

Transport policy has become more integrated since 1994. Emphasis has been placed on supporting regional and international trade. Various managing entities have been formed, most notably the South African National Roads Agency Limited (SANRAL) and the Passenger Rail Agency of South Africa (PRASA). The National Freight Logistics Strategy, the National Ports Act and the National Land Transport Act were approved in the late 2000s. New regulators have also been established, including the Ports Regulator and the Rail Safety Regulator.

A significant part of South Africa's freight transport infrastructure consists of freight

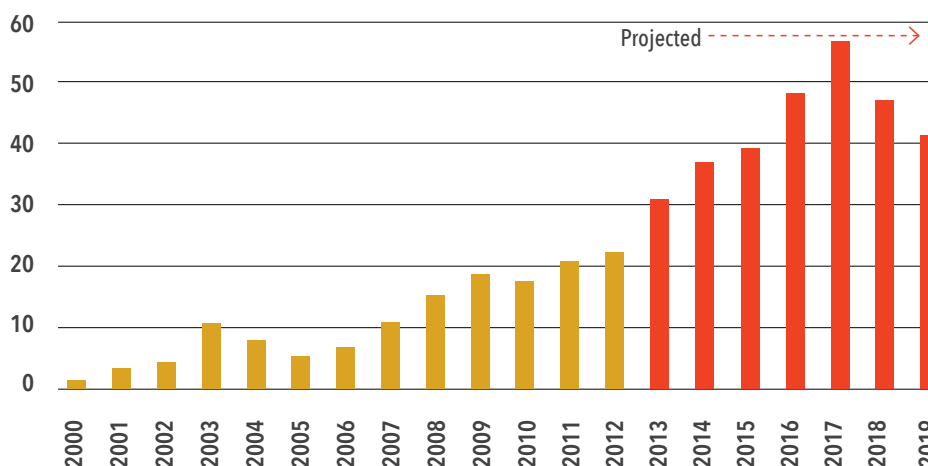
rail, ports and petroleum pipelines, controlled by the state-owned enterprise, Transnet. Transnet stepped up investment in infrastructure expansion after 2006, with projections seeing an even greater acceleration in expenditure expected in the years leading up to 2017 (see Figure 5.4).



Freight rail

Most of the investment in freight rail has gone towards upgrading existing wagons and buying new wagons, and adding passing loops to accommodate additional freight trains to improve exports. The Orex iron ore line's capacity has been expanded from about 20 million tons (mt) in 1994 to about 52mt in 2011. Currently, the iron ore line is being expanded to a capacity of 60.7mt. The export capacity for coal on the Coalex line was increased from 50mt in 1992 to 70mt by 2000. Coal exports dropped between 2005 and 2008, partly due to the global downturn, but also due to maintenance and operational difficulties encountered by Transnet in

Figure 5.4: Transnet capital expenditure, 2000–2012 (R billion)



Source: Transnet Annual Report 2012¹¹



maintaining the high-capacity lines. Currently, the coal line is being expanded to a capacity of 81mt. The scope of work has been finalised and geotechnical work is in progress. Investment in infrastructure between the Northern Cape and Port Elizabeth to accommodate new manganese mining entrants resulted in manganese ore capacity increasing from 1.5mt in 2002 to 7mt in 2011¹².

A large number of locomotives have been acquired in recent years and fleet modernisation is underway, as well as endeavours to ensure greater local content in the manufacture of locomotives and wagons. The internal distribution of goods in South Africa and the export of finished goods have steadily improved. For example, freight tonnages transported by rail increased from 177mt in 2009 to 207.7 mt by 2012/13¹³.

Ports

Container freight capacity at South Africa's ports has increased considerably since 1994. Significant infrastructure developments include the construction of the new Port of Ngqura in the Eastern Cape and a doubling of the capacity of the port to 800 000 containers per year in 2012. The capacity of the Cape Town Container Terminal was increased from 700 000 containers a year in 2009 to 900 000 containers a year in 2012. Another major undertaking was the deepening and widening of the Durban Harbour entrance channel to accommodate much larger vessels. The

acquisition and installation of seven tandem-lift ship-to-shore cranes in Durban seeks to improve capacity and port efficiency¹⁴.

Major investments currently under way include container-handling equipment at Ngqura in order to increase port capacity to 1.5 million containers per year by 2014, and the expansion of the Port of Durban's container terminal from a capacity of 2 million containers (in 2009) by an additional 1.4 million containers per annum, along with berth deepening to accommodate larger vessels¹⁵. Feasibility investigations and community consultations are being carried out for a new Durban Dig-out Port, mainly for containers, at the old Durban International Airport site.

Despite this expansion drive, productivity at South African ports remains stubbornly low at an average of about 28 gross crane moves per hour¹⁶, compared with the international standard of about 40 per hour. Improving productivity at the ports will need to be a key focus area for Transnet in coming years.

Pipelines

Significant investments have been made in pipeline infrastructure since 1994. A new pipeline was built to bring Mozambican gas into South Africa (a public-private partnership with Sasol), and the existing industrial gas pipeline network was extended. Transnet has also installed a new multi-product fuel pipeline from the coast to South Africa's industrial heartland.

Roads

Significant improvements have been noted on our national roads. In 1998, the 7 200km of national roads was absorbed into the newly established South African National Roads Agency Limited. Since its inception, SANRAL has leveraged private investment in road infrastructure by concessioning and tolling specific road routes. The Warmbaths toll road was developed in 1994. The largest toll road project, the reconstruction of the N4 corridor linking Johannesburg and Maputo in Mozambique (R1.4 billion), was launched in 1996. This was followed by the expansion and tolling of further sections of the N3. The N4 was further extended with the Platinum/Bakwena toll road in 2000.

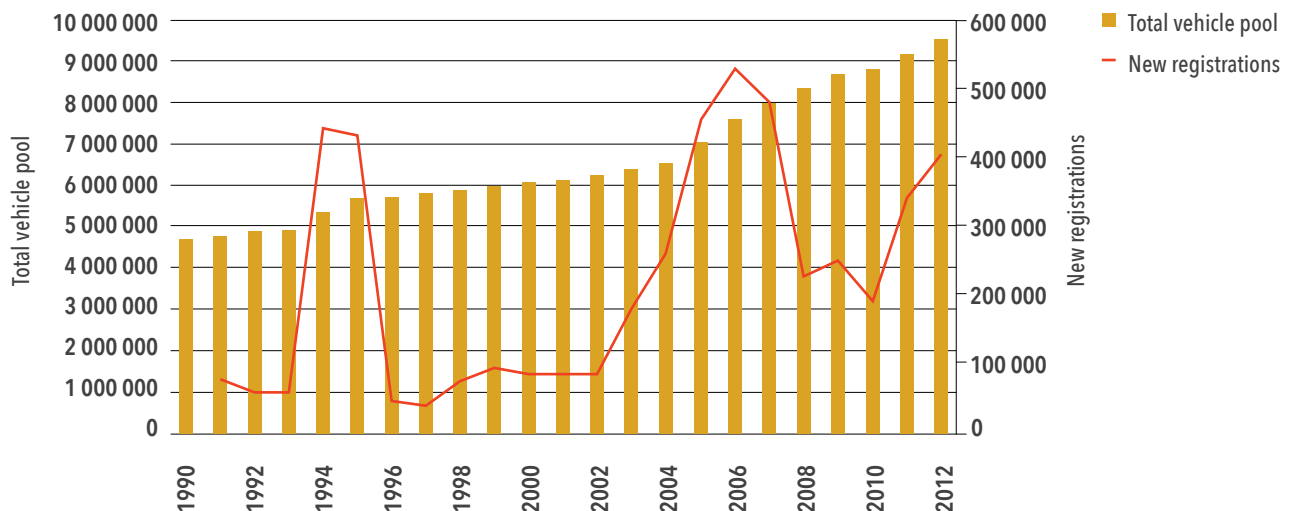
Non-toll roads are funded by the fiscus through annual budget allocations. These activities, which constitute about 81 percent



of national roads, are ring-fenced from toll road activities. Some toll roads are under long-term concessions to private parties under public-private partnerships. These are the N4 and Platinum Highway N3 Toll Concession (Pty) Ltd (N3TC), the N1/N4 Bakwena Platinum Corridor Concessionaire (Pty) Ltd (Bakwena) and the N4 Trans African Concessions (Pty) Ltd (TRAC). By 2012, private consortia had financed some R5.8 billion in capital for these projects¹⁷.

SANRAL also raises funds for some toll roads on its own balance sheet, for example, the Gauteng Freeway Improvement Project. Direct expenditure by SANRAL on non-toll and toll roads has accelerated since 2005. Future development of South Africa's national roads to meet rising vehicle volumes, as well as rising demand for time-sensitive goods and "just-in-time" production input requirements, depends partly on societal acceptance of the user charge principle for higher quality roads,

Figure 5.5: Total vehicle pool and new registrations, 1990–2012



Source: Electronic National Administration Traffic Information System, 2013



in comparison with the standard offering that is affordable to the tax base.

In comparison with the national roads, the standard of many provincial and local roads have not kept up with demand. Many were originally designed during the apartheid era for a smaller vehicle population, and have deteriorated with the increase in vehicles due to rising prosperity in the democratic era (see Figure 5.5), poor maintenance regimes and resource constraints. The 2002 Road Infrastructure Strategic Framework for South Africa (RISFSA) improved the classification of roads and allocated maintenance responsibilities more clearly. Government also introduced labour-intensive road construction and maintenance programmes, such as the Gundo Lashu Programme in Limpopo, the Zibambebe Programme in KwaZulu-Natal, and more recently the S'hamba Sonke Programme, which contributed to the upscaling of the Expanded Public Works Programme and job creation.

Commuter rail

About 2.2 million passenger trips per day are made on Metrorail. The use of Metrorail grew steadily from 1993 to 1999, levelling off until 2002, when it again rose significantly. In 2006, Transnet's Metrorail commuter rail assets were excised, merged with the rail assets of the South African Rail Commuter Corporation and renamed PRASA. The consolidation of passenger rail assets was completed in 2009, when Transnet's long-distance/inter-city passenger assets (Shosholoza Meyl) were transferred to PRASA. In 2010, the state-owned PRASA embarked on a 10-year capital investment programme to upgrade the signalling systems on its Metrorail lines. In 2012, PRASA also launched a plan to refurbish and replace its rolling stock.

Other modes of public transport

Other modes of public transport, such as buses and rapid rail routes, gained impetus after 2005 when government introduced the Public Transport Infrastructure and Systems Grant. The aim of the grant was to improve

public transport infrastructure, initially focusing on projects linked to the 2010 World Cup.

Government also allocated substantial funding to set up bus rapid transit (BRT) systems in several metros. The Gautrain project also got underway during this period, becoming operational in 2012.

The most commonly used mode of motorised public transport in the country is the minibus taxi. In 1999 government introduced a taxi-recapitalisation programme to incentivise the private minibus taxi industry to renew its fleets with newer and safer vehicles, in the interests of commuter safety. A scrapping allowance of R55 000 per vehicle was allowed, provided that a new vehicle adhering to a list of safety specifications was purchased. While the programme is currently under evaluation as a fixed-period incentive, it has resulted in the scrapping of over 57 000 taxis¹⁸ in poor condition over the last eight years in favour of vehicles with higher safety specifications, thus contributing to the drive for commuter safety.



Aviation

The state-owned Airports Company South Africa's (ACSA's) investment in airport infrastructure increased since the early 2000s in all nine major airports including Bram Fischer (Mangaung), Port Elizabeth, Upington, East London, George and Kimberley, but with a larger focus on Johannesburg, Durban and Cape Town. Investment accelerated after 2006, with investment focusing primarily on the construction of the new King Shaka International Airport in Durban and upgrading

OR Tambo Airport in Johannesburg. Other new airports and upgrades include the privately owned Kruger Mpumalanga International, Lanseria, Mmabatho/Mafikeng and Mthatha airports. ACSA has grown in strength and expertise over the years and already has two large international airport concessions – São Paulo, Brazil and Mumbai, India.

5.3.3 Water and sanitation

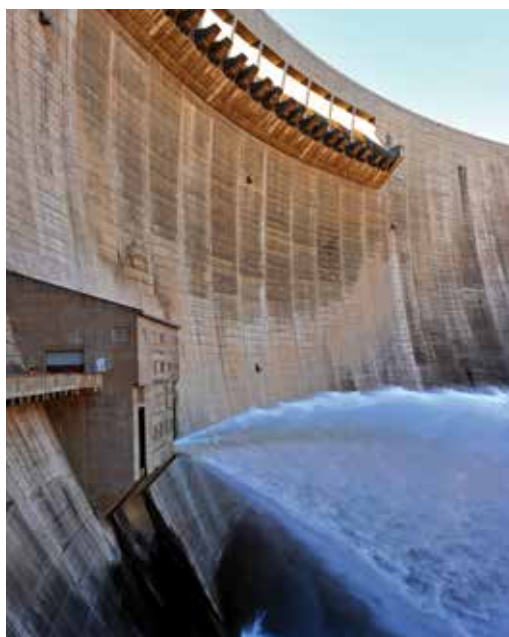
In 1994 approximately 40 percent of households¹⁹ had no access to basic water supplies (defined as 25 litres of safe water within 200 metres of their homes). The democratic era witnessed the rapid delivery of water services to the population, with the backlog reduced to 5 percent of households without access to basic water supplies in 2012.

In addition, in 1994, approximately 50 percent of households lacked basic sanitation (defined as a household toilet of at least a ventilated improved pit latrine standard). The democratic government also prioritised the rapid delivery of sanitation services to the population, increasing the percentage of households with access to at least a basic level of sanitation from 50 percent of households in 1994/95 to 83 percent in 2011/12²⁰. Despite the rapid progress, the bucket system, undignified sanitation and reliance on fetching water from streams prevail in some areas, and an ongoing focus on eradicating the remaining backlogs is needed.

South Africa is a water-scarce country. The limited availability of raw water is, in many cases, a constraint to economic growth. Reversing this trend will require redoubling efforts to improve and expand the country's water resources infrastructure.

Major bulk water infrastructure projects include the Lesotho Highlands Water Scheme, Phase 1 of which began delivering water to South Africa's industrial heartland in 1998. This was augmented in 2004 with the completion of the Mohale Dam. Government has now approved a second phase involving the new Polihali Dam, a transfer tunnel to the Muela Hydroelectric Plant, and expansions to the power plant and other infrastructure in Lesotho. This project is set for completion in 2020.

The Berg Water Project commenced in 2002 and started augmenting Cape Town's water supply in 2007. The Vaal River Eastern Subsystem Augmentation Project, an



emergency project to shift water from the Vaal Dam to the Trichardtfontein/Bosjesspruit dams in anticipation of a drought in 2007 that would have interrupted water supplies to Eskom and Sasol, has also been completed.

The Olifants River Water Resources Development Project aims to support mining (particularly platinum) in Limpopo, as well as provide communities with access to water. It has involved constructing the De Hoop Dam and an extensive distribution network to convert the Flag Boshielo and De Hoop dams into a single, functioning system. Construction on the dam started in 2007 and has been completed. Construction of the De Hoop bulk distribution pipelines is currently underway.

Also currently underway is the Komati Water Scheme Augmentation Project, the Mooi-Mgeni Transfer Scheme Phase 2 (within which the Spring Grove Dam was completed and inaugurated in 2013), raising the walls of the Hazelmere and the Clanwilliam dams, and the Umzimvubu Catchment Area Project, which is in the process of concluding a two-year feasibility study started in 2012. Many of the bulk water resource projects have been made possible by the establishment of the Trans-Caledon Tunnel Authority (TCTA), an agency of Department of Water Affairs²¹.

The quality and quantity of South Africa's water supply also depends on the country's ability to save water, prevent leakages, eradicate pollution, and operate and maintain wastewater

plants. Provision was made for catchment management agencies and authorities in legislation introduced in the late 1990s to deal with these challenges, but thus far only two catchment authorities have been set up, which do not cover all the major catchment areas in South Africa. Going forward, these authorities need to be established and adequately funded if one is to deal decisively with raw water quality and conservation issues.

5.3.4 Communications

While much was done during the pre-1994 era to set up broadcast, postal and fixed-line telephone infrastructure, in many respects these were mainly focused on the minority and lagged behind global advancements in telecommunications. While the rest of the world had been enjoying television for decades, South Africa only began limited television services (mainly for a white audience) in the mid-1970s. Widespread home satellite systems, internet services and mobile cellular telephony only became a reality with the advent of democracy and the end of the apartheid security state.

Institutional arrangements in the pre-democracy era were characterised by a few state-controlled organisations like the South African Broadcasting Corporation (SABC), Telkom and the South African Post Office (SAPO), with high levels of state interference and little or no competition. Media independence was restricted. Private-sector investment and involvement in the communications sector was almost non-existent. Investment in the sector was limited by government affordability, and access to communication services by the majority was poor.

Over the past 20 years, the broadcasting sector has expanded substantially. By 2013, three public television channels, two commercial television channels (including satellite television services) and more than 160 commercial and public radio stations were broadcasting in the country's various languages. South Africa is also preparing for the rollout of digital television. Billions of rands of private-sector investment has been made in cellular phone infrastructure, as well as digital data telecommunications.

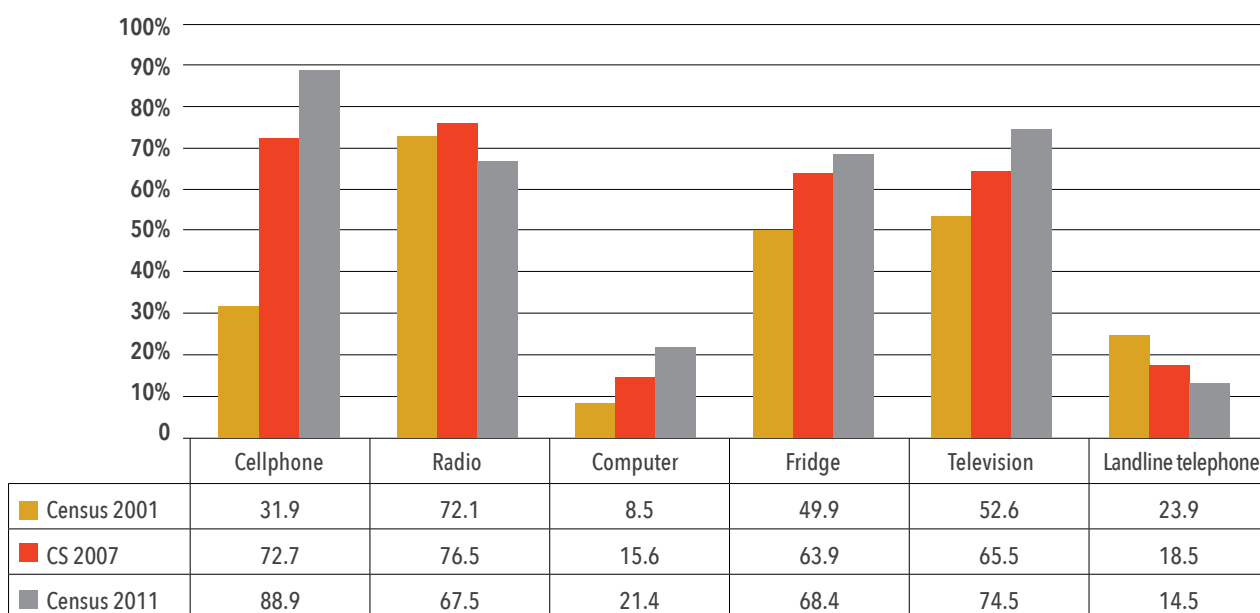
More South Africans have access to information and communication technology (ICT) now than in the past. Figure 5.6 shows that the percentage of households with access to cellphones increased from about 32 percent in 2001 to about 89 percent in 2011.

REFORM OF THE COMMUNICATIONS SECTOR SINCE 1994

- The Broadcasting Act was enacted in 1998. This removed the SABC from state control and entrenched its role as a public broadcaster.
- 58.3% of the broadcasting sector is owned by Historically Disadvantaged Individuals (HDIs). Given a zero base in 1992, this is a major achievement.
- The enactment of the Electronic Communications Act in 2005 increased market liberalisation.
- Entry of a third mobile operator, and second national fixed-line operator.
- Establishment of a state-owned broadband company, InfraCo, in 2009.
- Broadband Infraco is rolling out a national fibre optic network to provide broadband. MTN, Neotel and Vodacom are co-building an alternative national infrastructure network. These amount to over 5 000km of national fibre.
- Four additional submarine cable systems provide international commercial services in the last five years. These are: SEACOM in completed in 2009; EASSy in 2010; MainOne in 2010; and West African Cable System (WACS) in 2011.
- The Post Office has installed an estimated 700 000 new mail boxes around the country, and over 7.4 million new addresses since 2004, giving identity to households.
- To date the Post Office opened 430 000 new accounts for social grants and pensions and the Postbank has the highest number of Mzansi Accounts - about 2.6 million.
- Access of households to broadband is 33.7 percent (source: Research ICT Africa, 2012 ICT access and usage survey).
- 6 700 schools connected to broadband to date.
- Coverage of digital terrestrial television (DTT) is 82% with the full target being 84 percent. 16 percent is covered by satellite.
- Mobile phone termination rates were cut in 2010, and from 89 cents to 40 cents in 2013, then to 20 cents in 2014. This rate will fall to 10 cents by 2016, as part of the effort to reduce the costs of communication.

Source: Department of Communications²²

Figure 5.6: Percentage of households with access to telecommunications, 2001–2011



Source: Statistics South Africa, Census 2011²³

Similarly, television access increased from about 53 percent of households in 2001 to more than 74 percent in 2011, and computer ownership increased from 8.5 percent of households in 2001 to more than 21 percent in 2011, illustrating progress in addressing the digital divide. The two telecommunications tools that have seen a decline in penetration are landlines and radio in favour of newer technologies.

In step with global advancements, internet access, especially through broadband, has been encouraged. Broadband penetration is currently estimated at 14 percent over a personal computer, and 15 percent via a cellular phone, smart phone or tablet, with overall internet penetration estimated at over 33 percent²⁴.

Postal services have also increased. In its first year, the democratic government had opened at least 70 new post offices and upgraded many others in previously underserved areas. To date, the post office has one of government's largest infrastructural footprints around the country, with over 2 600 postal outlets, 1 170 of which are in rural areas, with visibility in major retail outlets across the country in the form of retail postal agencies²⁵. Many other postal outlets were upgraded to ensure that they have internet and network connectivity to be able to provide services in a more effective and efficient manner.

Despite rapid post-apartheid modernisation and high levels of private-sector participation and investment, the cost of communications in South Africa remains above world averages, while digital speeds and service offerings have remained relatively low. To address this, regulation of this sector needs to be strengthened, while maintaining the appetite for investment, continued modernisation and greater access to information and communication services for historically marginalised communities.

5.3.5 Industrial development zones

Between 1994 and 2001, the Department of Trade and Industry (the dti) promoted the concept of Spatial Development Initiatives. These projects were initially aimed at organising and mobilising public and private organisations and entities around specific spatially defined investments, such as the Maputo Corridor and others. Parallel to this, the concept of Industrial Development Zones emerged and

the programmes associated with this tended to focus on ports and airports. The most significant tangible infrastructure outcome arising from these initiatives has been the new port and logistics hub of Ngqura/Coega, which has grown significantly over a relatively short period of about 10 years. By 2010, these initiatives had contributed to attracting an estimated R56.9 billion worth of investments and had supported the creation of more than 69 424 direct job opportunities²⁶.

5.3.6 Social infrastructure grants

Much of the massive post-apartheid rollout of social infrastructure was made possible through the evolution of targeted fiscal grants for infrastructure. The Provincial Infrastructure Grant (later renamed Infrastructure Grant to Provinces) was introduced in 2000 with a modest R300 million to counter falling provincial capital budgets. The grant aimed to assist provinces to address historic infrastructure and maintenance backlogs, particularly for schools, hospitals, clinics, roads and rural infrastructure. Conditionalities attached to the grant forced improvement in the provinces' capacities to plan and manage projects. The grant grew rapidly and, in 2010, amounted to more than R11 billion²⁷. Similarly, the Municipal Infrastructure Grant (MIG) programme was put in place to support municipal infrastructure delivery. It currently amounts to approximately R15 billion per annum.

As aggregate infrastructure expenditure grew after 2000, the capacity of government entities to contract and spend the allocation emerged as a key constraint. By 2005, a significant proportion of infrastructure budgets was regularly being rolled over. This was particularly prevalent at the provincial and municipal spheres of government, prompting a range of support and capacitation programmes to be put in place. These have included programmes such as Siyenza Manje and others provided by the Development Bank of South Africa. The Business Trust also partnered the Presidency in 2006, financing the Support Programme for Accelerated Infrastructure Development (SPAID), which carried out a range of targeted projects aimed at removing the causes of infrastructure expenditure blockages. In addition, National Treasury and the CIDB developed a range of good practice notes, coupled with direct technical support to assist provinces to improve their social infrastructure delivery

programmes. These support programmes led to a marked improvement in provincial infrastructure expenditure levels, which have exceeded 95 percent over the last two years.

5.3.7 Public-private partnership projects

In the 1990s, there was some successful experience of public-private partnership (PPP) arrangements for national roads. Towards the end of the 1990s, government started to expand this approach to other infrastructure sectors, with the aim of mobilising private-sector finance and capacity. A PPP Unit was established in National Treasury in 2000 to provide the necessary support to such agreements. Some of the notable infrastructure projects concluded through PPPs have been the Inkosi Albert Luthuli Hospital, Mangaung Prison, Universitas and Pelonomi hospitals, Chapman's Peak toll road, the dti head office and the Gautrain. Moving forward, there is a need for government to assess what has worked well and what has not worked well with these PPP agreements, as the basis for identifying more PPP opportunities for the private sector to invest in, in a manner that is sustainable and affordable to both government and the users of the infrastructure.

5.4 CHALLENGES

While each infrastructure sector faces unique challenges, there are a range of common issues, which are discussed below.

5.4.1 Integrating policy, planning and delivery across sectors

An integrated approach to policy, planning and delivery of infrastructure across sectors has never been fully in place, and such an approach is required to ensure effective and efficient infrastructure investment. It is necessary to avoid situations such as housing projects being built in areas without access to electricity, water, roads and sanitation.

Important steps in this regard have already been taken, firstly with the NDP setting the basis and giving direction to all infrastructure sectors towards achieving a common 2030 vision for the construction of South Africa's future. Another important step has been the establishment of the Presidential Infrastructure Coordinating Commission, which brings all spheres of government together in a joint forum for the first time to promote infrastructure coordination and



Construction of Medupi power station



decision-making. This, together with the adoption of a National Infrastructure Plan, will not only improve decision-making in economic infrastructure sectors, but will also result in delivery on an integrated and sequenced programme across sectors, in line with the NDP, which should yield more effective outcomes.

The President launched the National Infrastructure Plan in February 2012. The plan clusters, sequences and prioritises future projects and infrastructure initiatives into 18 strategic integrated projects (SIPs)²⁸. This will be a continuous process, creating a “pipeline” of projects that give substance to the infrastructure initiatives outlined in the NDP, while also giving effect to infrastructure as one of the key drivers of the New Growth Path.

5.4.2 Market structure, regulation and pricing

While South Africa is not unique in the dominance of state-owned enterprises

(SOEs) in the delivery of infrastructure, principally because network infrastructure creates natural monopolies, the regulatory framework is relatively poor, both in design and implementation.

A stronger regulation policy was adopted early on in the first decade of democracy. Putting the energy regulator in place took a further five years, and it is only over the past five years or so that the regulatory function, operating on a cost-based methodology, is being applied to protect electricity infrastructure users from the unjustified pass-through of costs. Stronger regulation in respect of transport infrastructure monopolies was also adopted as policy in the first decade, but its implementation was delayed. It is only the Port Regulator that is in place, although there is a likelihood that other appropriate economic regulators for sectors such as rail will be set up soon. Work towards the proposed Single Transport Economic Regulator (STER) will partly address this concern.

In the water sector, pricing is such that where costs can be recovered, this is not being done, and there is no independent regulator. The Department of Water Affairs (which is effectively the regulator) has for many decades set prices that are below cost to maintain the water resources system, let alone allow for further development. The sector is therefore unnecessarily over-reliant on the fiscus. A key structural contributing factor is that the department is a policy-maker, implementer and regulator at the same time.

Where the legislative foundation for regulation is sound, for example, in the ICT sector, the regulators have not always effectively regulated their sectors, resulting in prices above global trends, constraining access and undermining the competitiveness of the national economy.

5.4.3 Financing mechanisms

Across all the sectors, challenges in mobilising resources for operations and maintenance, as well as future investments in economic infrastructure, loom large. Planning and budgeting processes for infrastructure have historically tended to neglect operations and maintenance.

More broadly, the mechanisms that are currently in place to finance infrastructure require urgent reform. Resources are in some cases flowing to the wrong areas. For example, in the case of commuter rail transport, infrastructure is not expanding in tandem with the enormous growth in demand because of financial constraints, in a context where commuter rail transport has substantial benefits for poor households. At the same time, PRASA subsidises long-distance passenger rail at the expense of commuter rail, even though the former cannot compete with road transport.

In the water sector, too, there seems to be an unfair cross-subsidy by taxpayers and households to large-scale industry, mining and agriculture, who together consume the lion's share of raw water. In addition, people pay a wide range of different prices for essentially the same product – raw water – depending on the particular dam or scheme from which it is obtained. In many cases, the price depends on how long ago it was built. Thus, poor people who never had water in the past will have to pay higher prices for water from new dams. To address equity in the pricing of raw water as a

product, as well as funding for development, the water sector needs an appropriate pricing strategy with equitable levelised pricing for various categories of raw water off-take paying their fair share of infrastructure costs, an independent regulator, and an infrastructure agency (similar to Eskom), with a balance sheet that enables borrowing as a public entity and levelised pricing, rather than project financing and project-level pricing to consumers.

As mentioned earlier, considerable success has been achieved in mastering the art of using private financing for road infrastructure, the Gautrain, hospitals and some government head office buildings. Despite some attempts, government has not yet been able to successfully replicate this for prison infrastructure, water services, electricity base-load generation, rail infrastructure, ports and pipelines. The telecommunications sector has witnessed considerable investment by the private sector, which has led to rapid service provision in the sector.

What has also emerged over the 20-year period is that there are limits to the quantum of infrastructure that can be financed through tariffs on existing users. In the case of electricity, pipelines and (recently) toll roads, the fiscus has had to provide additional balance sheet support through direct capital grants, loans or guarantees to avoid sharp tariff increases.

Despite these affordability limits and the ability of the state to assist, the advancement and future development of many aspects of the country's economic infrastructure will depend on the acceptability of the user charge principle for higher levels of infrastructure services and differentiated high-value products, compared with the standard offering that is paid by and is affordable to the tax base (for example, the Gautrain vs. Metrorail). Some differentiation within the user charge principle is required between "project internalised user charges" versus "system-wide (levelised) user charges". For example, it does not make sense for a ship to be charged more for using a newly refurbished berth than one using an old berth, and so it is fair to distribute the cost of the development of new berths to all berths.

5.4.4 Capacity constraints

Over the past 20 years, there have been various national initiatives to estimate future infrastructure-related skills shortages

and to develop plans to address these shortages. A related issue is the internal dynamics within the institutions and entities tasked with the delivery of infrastructure. Poor organisation and management of technical expertise, alongside low morale and political interference, diminish, in some cases, the returns from skilled individuals. In cases where capacity constraints effectively prevent the implementation of the economic infrastructure agenda, these skills need to be sourced from elsewhere, as proved to be highly effective in the construction of infrastructure for the 2010 FIFA World Cup.

5.4.5 Backlogs, rehabilitation and new infrastructure

There are tensions between the three different streams of infrastructure delivery (maintenance and rehabilitation, addressing backlogs, and responding to new demand) and managers make difficult choices in maintaining a fair balance between building new infrastructure for the many who have no services, and maintaining or rehabilitating infrastructure and facilities for those who already have access to services. A growing economy requires all three infrastructure streams to be implemented simultaneously.

5.5 CONCLUSION AND WAY FORWARD

The NDP sets the broad direction for the way forward for infrastructure development in South Africa and its crucial role and alignment within the country's 2030 vision. The point of departure in the NDP is that, while South Africa has a relatively good national economic infrastructure network, the challenge is to maintain and expand it to address the demands of the growing economy. The economy has already been constrained by inadequate investments and the ineffective operation and maintenance of existing infrastructure.

The NDP expresses concern that government does not have sufficient institutional or financial capacity to finance and implement the infrastructure investment plans on the scale required to support further economic growth. In addition, maintenance programmes are lagging behind. Resource constraints will therefore require trade-offs between competing national goals. Investments need to be made in a structured, considered manner to prevent inappropriate initiatives, protect South Africa's resources and ensure

that prioritised investments are efficiently implemented. The NDP recognises that private funding will need to be sourced for some of the required infrastructure investments, and that government needs to better manage collaborative investment by businesses and government in key infrastructure projects and to shape its institutional, policy and regulatory environment in order to attract investment.

In giving effect to the coordination, collaboration and elaboration of NDP infrastructure imperatives, the establishment of the PICC has brought the political heads of the three spheres of government together for the first time in a joint intergovernmental forum headed by the President²⁹. Through the PICC process, South Africa now has a coordinated National Infrastructure Plan comprising 18 strategic integrated projects. A summary of each of the 18 Strategic Integrated Projects is provided in the box at the end of this chapter. The PICC focuses on ensuring that there is adequate coordination of both planning and implementation between the various stakeholders involved in each of the SIPs, monitors progress, and intervenes to unblock bottlenecks. Other focus areas of the PICC include infrastructure skills, supply of materials, localisation, and creating an enabling legislative and regulatory environment for investment in infrastructure.

In implementing the National Infrastructure Plan, government will need to focus on the following:

- Improving regulation, funding and investment, including enhancing the capacity and effectiveness of regulators and addressing existing gaps in the water and rail sectors.
- Ensuring reliable generation, transmission and distribution of energy (electricity, liquid fuels, coal and gas).
- Ensuring the maintenance, strategic expansion, operational efficiency, capacity and competitiveness of South Africa's logistics and transport infrastructure (ports, logistics hubs, road, rail and public transport infrastructure and systems).
- Ensuring maintenance and supply availability of the country's bulk water resources infrastructure (dams and inter-basin transfers, bulk water and wastewater).



- Expansion, modernisation, access and affordability of South Africa's information and communications infrastructure and electronic communication services, including broadband and digital broadcasting.
- Continuing the rapid rollout of all social infrastructure in terms of NDP targets until universal access is realised.

These are crucial to the realisation of the NDP goals of moving towards an inclusive and dynamic economy, and of urgently launching the virtuous cycle that allows the

country to move to a new growth trajectory. This implies investment in rail, water and energy infrastructure alongside regulatory reforms that provide policy certainty and that encourage the private sector to invest more in infrastructure, and in general economic capacity.

PICC NATIONAL INFRASTRUCTURE PLAN: SUMMARY OF STRATEGIC INTEGRATED PROJECTS (SIPS)

SIP 1: Unlocking the Northern Mineral Belt with the Waterberg as the catalyst:

Investing in rail, water pipelines and energy generation, and transmission infrastructure in order to unlock rich mineral resources in Limpopo. Extending rail capacity to Mpumalanga power stations to further shift coal from road to rail.

SIP 2: Durban-Free State-Gauteng Logistics and Industrial Corridor:

Strengthening the logistics corridor between South Africa's main industrial hubs, integrating the Free State Industrial Strategy, disconnected industrial and logistics activities and rural production centres. It includes development of a new Durban port, Aerotropolis at OR Tambo International Airport and Dube Trade Port.

SIP 3: South Eastern Node and Corridor:

Building the new Mzimvubu Dam, irrigation systems, N2-Wild Coast highway, manganese sinter and smelter, improved rail capacity, possible Mthobmo refinery, transshipment hub at Ngqura, and port and rail upgrades.

SIP 4: Unlocking the economic opportunities in North West:

Accelerating investments in roads, rail, transmission infrastructure, bulk water and water treatment, and opening up economic opportunities.

SIP 5: Saldanha-Northern Cape Development Corridor:

Integrating development through rail and port expansion, back-of-port industrial capacity, expanded iron ore production and strengthened maritime capacity for the gas and oil activities along Africa's west coast.

SIP 6: Integrated Municipal Infrastructure Project: Developing national capacity to help the 23 least-resourced districts in addressing maintenance backlogs and bulk infrastructure upgrades.

SIP 7: Integrated Urban Space and Public Transport Programme:

Coordinating decision-making for the 12 largest metropolitan municipalities on economic and social infrastructure, public transport and human settlement for sustainable urban settlements connected by densified transport corridors.

SIP 8: Green energy in support of the South African economy:

Supporting a diverse range of sustainable energy initiatives as envisaged in the Integrated Resource Plan 2010 and biofuel production facilities.

SIP 9: Electricity generation to support socio-economic development:

Accelerating the construction of new electricity generation capacity in accordance with the Integrated Resource Plan 2010.

SIP 10: Electricity transmission and distribution for all:

Expanding the transmission and distribution network. Aligning the 10-year transmission plan to address backlogs, broadband rollout, freight rail line development to leverage off regulatory approvals and existing capacity.

SIP 11: Agri-logistics and rural infrastructure:

Investment in agricultural and rural infrastructure through investment in storage, transport links, fencing, irrigation, R&D, processing, aquaculture and rural tourism.

SIP 12: Revitalisation of public hospitals and other healthcare facilities:

Building and refurbishing public health facilities and revamping 122 nursing colleges to prepare for the requirements

of the National Health Insurance Programme.

SIP 13: National school-build programme:

A standardised building programme to replace inappropriate structures and provide basic services, while addressing the backlog, to improve outcomes and reduce overcrowding.

SIP 14: Higher education infrastructure:

Development of infrastructure for higher education, including new universities, lecture halls, student accommodation, libraries, labs, and ICT, recreational, retail and transport facilities.

SIP 15: Expanding access to communication technology: broadband for all by 2020:

Linking districts, local municipalities and deep rural areas with digital infrastructure. This includes the migration of television from analogue to digital broadcasting.

SIP 16: SKA and MeerKAT:

Building an advanced radio telescope facility linked to research infrastructure and high-speed digital capacity, providing an opportunity for Africa and South Africa to contribute to advanced science.

SIP 17: Regional integration for African cooperation and development:

Partnering with fast-growing African economies on infrastructure projects to create diversified, competitively priced options for transport, water and energy.

SIP 18: Developing a sustainable water supply-chain: "Source to tap to source":

A 10-year plan, including new infrastructure and the upgrading of existing water and sanitation infrastructure for social and economic growth.

Source: PICC: A Summary of the South African National Infrastructure Plan³⁰

REFERENCES

- ¹ Input obtained from National Treasury, (2013).
- ² National Treasury, (2013). "Budget Review 2013."
- ³ Department of Energy. "Basic Electricity Overview (online)." Accessed on 18 February 2014. Available from <www.energy.gov.za/files/electricity_frame.html>.
- ⁴ Department of Energy. "Basic Electricity Overview (online)." Accessed on 18 February 2014. Available from <www.energy.gov.za/files/electricity_frame.html>.
- ⁵ Progress reporting to the Department of Performance Monitoring and Evaluation by the Department of Energy, (2013).
- ⁶ Department of Performance Monitoring and Evaluation & Development Bank of Southern Africa, (2012). "The State of South Africa's Economic Infrastructure: Opportunities and Challenges 2012." Development Bank of Southern Africa.
- ⁷ Progress reporting to the Department of Performance Monitoring and Evaluation by Eskom, (2013).
- ⁸ Progress reporting to the Department of Performance Monitoring and Evaluation by the Department of Public Enterprises, (2013).
- ⁹ Progress reporting to the Department of Performance Monitoring and Evaluation by the Department of Energy, (2013).
- ¹⁰ Progress reporting to the Department of Performance Monitoring and Evaluation by Eskom, (2013).
- ¹¹ Transnet, (2012). "Integrated Report 2012."
- ¹² Rustonjee, Z. (2013). Report commissioned by the Department for Performance Monitoring and Evaluation for the 20 Year Review in the thematic area: Infrastructure.
- ¹³ Transnet, Department of Transport and Eskom, (2013). "Programme of Action Core Indicators – Outcome 6 (online)." Accessed 18 February 2014. Available from <<http://www.poa.gov.za/Outcome6/Pages/LandingPage.aspx>>.
- ¹⁴ Progress reporting to the Department of Performance Monitoring and Evaluation by Transnet, (2013).
- ¹⁵ Progress reporting to the Department of Performance Monitoring and Evaluation by Transnet, (2013).
- ¹⁶ Transnet and Council for Scientific and Industrial Research, (2013). "Programme of Action Core Indicators – Outcome 6 (online)." Accessed 18 February 2014. Available from <<http://www.poa.gov.za/Outcome6/Pages/LandingPage.aspx>>.
- ¹⁷ Information on national and toll roads provided by Rustonjee, Z. for the 20 Year Review in the thematic area: Infrastructure, (2013).
- ¹⁸ Progress reporting to the Department of Performance Monitoring and Evaluation by National Treasury, (2013).
- ¹⁹ Department of Performance Monitoring and Evaluation, (2013). "Development Indicators 2012."
- ²⁰ Department of Performance Monitoring and Evaluation, (2013). "Development Indicators 2012."
- ²¹ Rustonjee, Z. (2013). Report commissioned by the Department for Performance Monitoring and Evaluation for the 20 Year Review in the thematic area: Infrastructure.
- ²² Department of Communications, (2014). "ICT Sector 20 Year Review." Unpublished.
- ²³ Statistics South Africa, (2012). "Census 2011." Statistical release P0301.4.
- ²⁴ BMI-TechKnowledge Group & Department of Communications, (2013). "Programme of Action Core Indicators – Outcome 6 (online)." Accessed 18 February 2014. Available from <<http://www.poa.gov.za/Outcome6/Pages/LandingPage.aspx>>.
- ²⁵ Department of Communications, (2014). "ICT Sector 20 Year Review." Unpublished.
- ²⁶ Rustonjee, Z. (2013). Report commissioned by the Department for Performance Monitoring and Evaluation for the 20 Year Review in the thematic area: Infrastructure.
- ²⁷ Rustonjee, Z. (2013). Report commissioned by the Department for Performance Monitoring and Evaluation for the 20 Year Review in the thematic area: Infrastructure.
- ²⁸ Department of Performance Monitoring and Evaluation & Development Bank of Southern Africa, (2012). "The State of South Africa's Economic Infrastructure: Opportunities and Challenges 2012." Development Bank of Southern Africa.
- ²⁹ Department of Performance Monitoring and Evaluation & Development Bank of Southern Africa, (2012). "The State of South Africa's Economic Infrastructure: Opportunities and Challenges 2012." Development Bank of Southern Africa.
- ³⁰ Presidential Infrastructure Coordinating Commission, (2012). "A Summary of the South African National Infrastructure Plan."