7

Infrastructure

Overview

Investments in electricity, water, transport, telecommunications and housing

South Africa's investment in infrastructure gained momentum in the years leading up to the 2010 soccer World Cup, and is set to expand as the foundation of a national growth and development strategy. The country's electricity, water, transport and telecommunications networks are being extended, education and health capacity is being expanded, and human settlements are being built and upgraded to strengthen the fabric of communities.

Over the medium-term expenditure framework (MTEF) period, budgeted and approved public-sector projects total R844.5 billion. As announced in the State of the Nation Address, the Presidential Infrastructure Coordinating Commission will give new impetus to the planning and implementation of major capital projects, described in Chapter 1, raising the level of investment spending and contributing to industrial and regional development.

All projects will be subject to rigorous assessment, and not all will be funded

All public-sector infrastructure projects will be subject to rigorous assessment to determine their feasibility. Not all of the R3.2 trillion of infrastructure projects under consideration (see Table 7.1) will be approved for implementation. Government will choose the most cost-effective projects that provide optimal long-term benefits.

Coordinating the infrastructure matrix requires improved planning and project assessment

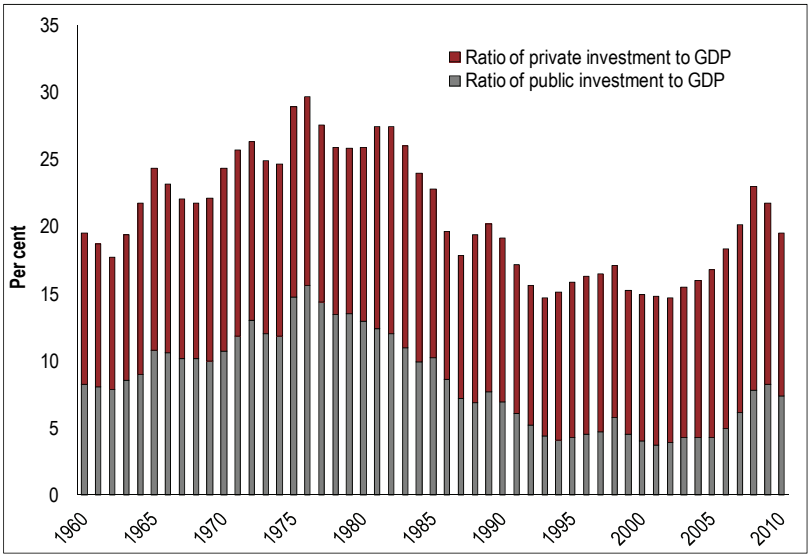
Major infrastructure projects can take more than a decade to implement. Meeting the complex challenges of a diverse and geographically dispersed set of capital projects requires long-term planning, detailed analysis, and continual learning and adaptation. Government acknowledges that public-sector capacity to implement projects is presently inadequate, and is taking steps to strengthen planning and implementation capacity at all levels.

Reversing a pattern of underinvestment

Sharp rise in capital investment began in the mid-1990s

South Africa's critical infrastructure needs are in part the outcome of two decades of underinvestment. As shown in Figure 7.1, public infrastructure spending tailed off from the early 1980s. From the mid-1990s, government began to increase capital spending, with a sharp rise after 2003 as prudent management of the economy created the fiscal space for long-term investment. Private-sector capital formation has also increased strongly, rising by 84 per cent between 2002 and 2008.

Figure 7.1 Public and private-sector capital investment, 1962 – 2010



Source: Reserve Bank

In 2010, public-sector capital investment was 7.4 per cent of GDP and private investment was 12.2 per cent of GDP

The experience of other developing countries shows that capital investment equivalent to about 25 per cent of GDP is generally needed for a substantial rise in per capita income. In recent years, government has sought to accelerate public infrastructure spending, while also encouraging greater private-sector investment. South Africa's public-sector capital investment stood at 7.4 per cent of GDP in 2010, while investment by private enterprises amounted to 12.2 per cent of GDP.

Table 7.1 summarises the sectoral breakdown of the estimated R3.2 trillion worth of large-scale projects currently under consideration or in progress. Of this total, about a quarter are being financed and implemented, and the remaining three-quarters are under assessment.

A need for thorough assessments of project feasibility

Expanding the range of capital projects under way will depend on thorough feasibility assessments, improved regulatory and oversight processes, and enhanced planning and implementation capacity.

This chapter reviews major developments in key infrastructure sectors. It discusses how government plans to overcome hurdles in managing the infrastructure pipeline and financing capital projects in a sustainable way.

Table 7.1 Mega-projects under consideration, 2012 – 2020

	Project stage								
R billion	**Concept**	**Pre-feasibility**	**Feasibility**	**Financing**	**Detailed design**	**Tender**	**Cons-truction**	**Ongoing prog-rammes[1]**	**Total**
Water	20	–	–	32	–	5	18	–	74
Transport	310	–	78	17	12	88	8	71	583
Electricity	720	268	314	–	95	103	345	101	1 945
Liquid fuels	–	–	211	–	2	–	–	–	213
Education	20	–		40	–	–	–	125	185
Health	–	–	50	29	–	–	–	31	110
Telecommunication	12	–		–	–	–	3	–	15
Human settlement	–	–		78	–	–	–	–	78
Total	**1 082**	**268**	**653**	**195**	**109**	**195**	**374**	**328**	**3 204**
% total expenditure	*33.8%*	*8.4%*	*20.4%*	*6.1%*	*3.4%*	*6.1%*	*11.7%*	*10.2%*	*100.0%*

1. Ongoing programmes include multiple projects at different stages of development, such as universal access to electricity and school building programme

Sector review

Electricity

South Africa's programme to increase electricity generation capacity is well under way. Eskom's two large coal-fired plants – Medupi and Kusile – are under construction and expected to start operating in 2013 and 2014, with full electricity generation expected by 2017 and 2018 respectively. The Ingula pumped storage scheme is on track to assist with peak capacity supply from 2014. Several mothballed plants have been returned to service and most of their units are operational.

Medupi and Kusile are under construction and expected to start operating in 2013 and 2014

Switching on renewable energy capacity

Renewable energy features strongly in South Africa's long-term energy plans. The Integrated Resource Plan sets an ambitious target of providing 21 per cent or 18.9GW of generation capacity from renewable sources by 2030.

It is envisaged that 9.2GW will be generated from wind, 8.4GW from photovoltaic sources (solar panels) and 1.2GW from concentrated solar power that use mirrors and lenses to concentrate the sun's rays. Other technologies, such as biogas and small hydroelectric installations, are included in the mix.

Strengthening renewable energy involves developing local supply chains, diversifying supply and helping meet the environmental goals set out in the *National Climate Change Response Paper* adopted in 2011. Several other renewable energy projects complement these efforts:

- Government's renewable energy independent power producer programme aims to procure 3 725MW of renewable energy by 2016. In late 2011, 28 bidders were selected to produce 1 415MW of renewable energy, mostly from wind and solar power. There will be a separate bidding process to encourage smaller producers (<5MW) and to test innovative technologies not included under the main programme.
- Eskom plans to build a 100MW concentrated solar power plant.
- Government is exploring the feasibility of a large solar park of between 1 000MW and 5 000MW in the Northern Cape to accommodate independent power producers.

Table 7.2 Major infrastructure projects

Project name/ Implementing agent	Total project cost R billion	Project objective and completion target date	Status
Energy			
Kusile power station (Eskom)	121.0	Build 4 800MW coal-fired power station, first unit commissioned by 2014	Under construction
Medupi power station (Eskom)	99.0	Build 4 788MW coal-fired power station, first unit commissioned by 2013	Under construction
Grootvlei (Eskom)	7.8	Return to service of 1 180MW power station, scheduled completion in 2012	Civil works complete, commissioning in progress
Komati (Eskom)	12.9	Return to service of 1 000MW power station, scheduled for completion in 2012	Civil works complete, commissioning in progress
Ingula pump-storage scheme (Eskom)	21.4	Build 1 332MW hydroelectric power station to begin operating in 2014	Dam constructed, pipe installation in progress
Renewable energy (independent power producers)	120.0	3 725MW of renewable energy procured into national grid by 2016	Tender process under way, 1 415MW of bids in first procurement round confirmed
Open-cycle gas turbine (independent power producers)	15.4	Build 1 000MW power plant, scheduled completion in 2021	Tendering process undertaken
Distribution backlog (Eskom and municipalities)	27.5	Refurbishment and new distribution network	Ongoing programme
New transmission lines (Eskom)	95.0	Upgrade and new transmission lines over 5 years	Work in progress
Transport			
Passenger railways (PRASA)	80.0	Acquire a new fleet of rolling stock over 20 years	Procurement has commenced
National road improvements (SANRAL)	45.4	Maintenance improvements, refurbishment and new roads	Ongoing programme
Rolling stock and locomotives for freight rail (Transnet)	7.7	Acquire rolling stock and locomotives for general freight rail	Procurement under way
Provincial road improvements (Provincial Department of Roads)	25.5	Maintenance, refurbishment and new roads over next 3 years	Work in progress
Ngqura container terminal (Transnet)	7.9	Improve port capacity by 800 000 units, first phase completed in 2012	Port complete, dredging of 2 berths and construction of port rail line in progress
Water			
Lesotho Highlands water project phase II (TCTA)	7.5	Generation of hydroelectric power and development of water transfer scheme	Recent decision to proceed with financing options being developed
Komati (TCTA)	1.7	Construction of a water pipeline in Mpumalanga to be completed in 2012	Design complete, construction commenced
Mokolo-Crocodile water augmentation project (TCTA)	15.0	Phase 1 to deliver water in 2014	Financing phase II in progress
Olifants River water resource development project (TCTA)	16.1	Construction of a dam and bulk distribution to be completed in 2016	Dam construction nearing completion; bulk distribution design negotiations in progress
Sedibeng regional sanitation scheme (Sedibeng district municipality, Midvaal and Emfuleni local municipalities)	5.0	Increasing capacity of wastewater treatment system	Appointment of service provider in progress
Housing			
Cornubia housing development (Housing Development Agency and eThekwini)	5.1	Construction of 19 313 mixed-income, mixed-density houses, to be completed in 2016/17	80 ha of land will be made available for sale during 2012
Telecommunications			
Digital terrestrial television (Sentech)	0.8	Start analogue terrestrial network by December 2013	Signal testing phase recently completed
National wireless broadband network (Infraco)	1.0	Acquire additional broadband capacity	Cables are being laid

Table 7.3 Major infrastructure projects in concept, pre-feasibility and feasibility stages

Project name/ Implementing agent	Total project cost R billion	Project objective and completion target date	Status
Energy			
Nuclear fleet build (Eskom)	300.0	Generation of 9 600MW scheduled for completion by 2029	Final stages of consideration before financial proposal can be determined
Grand Inga (Government of the Democratic Republic of Congo)	200.0	First phases of hydroelectricity project of 40 000MW	South Africa assessing support options
Imported hydroelectricity options (Eskom)	52.2	Hydroelectric, gas and coal projects in Southern African countries	Options of off-take agreements and financial support for projects being considered
Solar park (Central Energy Fund)	200.0	Build 5GW scale solar park in the Northern Cape	Feasibility study to be completed in 2012
Closed cycle gas turbine (Independent Power Producers)	13.6	Construction of 2 450MW of additional gas turbines by 2029	Option under the Integrated Resource Plan
Coal Three (Eskom)	111.0	Build third coal-fired power plant	Feasibility aspects being considered
Transport			
Moloto rail (Transnet)	10.0	Construction of 140km line from Pretoria to Siyabuswa	Feasibility study under way
Manganese rail and terminal (Transnet)	18.0	Upgrade rail, port and terminal capacity for manganese export	Feasibility study under way
Iron-ore line (Transnet)	13.0	Expand Sishen-Saldanha iron ore railway line	Feasibility studies completed
Coal line (Transnet)	37.0	Upgrade of the coal line from Mpumalanga to Richards Bay to 80mt over 10 years	Feasibility studies completed
High speed rail (Department of Transport)	300.0	Build a passenger or freight line between Durban and Johannesburg	Concept
Water			
Mzimvubu water resources development (Department of Water Affairs)	20.0	Build dam for hydroelectricity and agricultural irrigation scheme	Feasibility studies to be undertaken
Liquid fuels			
Oil and gas exploration on the west coast (Central Energy Fund)	11.0	Exploration of commercially recoverable oil and gas volumes	Feasibility studies under way
Project Mthombo (PetroSA)	200.0	Build 360 000bpd crude oil refinery at Coega and supporting infrastructure	Feasibility studies under way for smaller-sized refinery
Education			
Mpumalanga University (Mpumalanga Province)	10.0	A new university	Funding committed to project development
Northern Cape University (Northern Cape Province)	10.0	A new university	Funding committed to project development
Hospitals			
Limpopo Academic Hospital (Limpopo Department of Health)	6.0	Develop academic hospital	Feasibility studies in progress
Nelson Mandela Hospital (Eastern Cape Department of Health)	6.0	Upgrade and rehabilitation of hospital	Feasibility studies in progress
Chris Hani Baragwanath Hospital (Gauteng Department of Health)	6.0	Upgrade and rehabilitation of hospital	Feasibility studies in progress
Dr George Mukhari Hospital (Gauteng Department of Health)	6.0	Upgrade and rehabilitation of hospital	Feasibility studies in progress
King Edward VIII Hospital (KZN Department of Health)	6.0	Upgrade and rehabilitation of hospital	Feasibility studies in progress

To complement these efforts and introduce competition into the electricity generation sector, government has launched a 3 725MW renewable energy procurement programme, with the first round of over 1 415MW of mainly wind and solar projects successfully tendered to independent power producers in late 2011. Also under consideration is a nuclear power programme to generate 9 600MW of electricity.

Until the new plants are operating, electricity supply will remain tight

In combination, these initiatives will enable the country to meet long-term demand. Until the new plants are up and running, however, electricity supply will remain tight. While this has implications for industry growth in the short term, there are benefits in the adaptations that are taking place to promote greater energy efficiency, use of renewable energy and co-generation at industrial plants. Eskom is also working to manage demand through initiatives such as solar water geysers, pumped-water hydroelectric systems and consumer awareness campaigns.

Investment in transmission and distribution required

To ensure that electricity can reach businesses and households, simultaneous investments in transmission and distribution are also needed. Eskom plans to upgrade existing transmission systems and build new ones, taking into account growth in demand from current and potential customers, spatial development patterns and changes in the economy. Large investments are needed to build, refurbish and maintain distribution networks, and the Department of Energy is working with Eskom and municipalities to ensure these meet the country's needs.

Setting tariff levels

Tariffs need to reflect costs and be affordable for households and businesses

Delivering on electricity projects has involved expanding the range of technologies and the number of producers contributing to the national grid – and this requires additional regulatory, technical, financial and project management capacity. In addition, tariff levels need to reflect the price of electricity so that the industry is sustainable and new investment can take place to meet growth in demand. Tariffs must also be affordable for homes and businesses – with particular sensitivity to low-income households. While price increases for electricity are necessary, they should go hand in hand with improved efficiencies and accountability by suppliers, reliable billing and revenue collection services, and increased cost transparency.

Liquid fuels

Liquid fuel powers most of South Africa's transport and has a range of industrial uses. To ensure that supply is available to customers when and where they need it, logistical systems need to be reviewed and upgraded at regular intervals, taking into account shifts in population growth, spatial development, demand for different grades of fuel, changing transport patterns and regional trends.

First phase of Transnet's R23.4 billion multiproduct pipeline has recently been completed

Public-sector investments in this sector are focused on logistics infrastructure. Phase 1 of Transnet's R23.4 billion new multiproduct pipeline has recently been completed and commissioned. The pipeline will increase capacity to meet inland demand and moderate road congestion by reducing the number of fuel tankers traveling between

Durban and Johannesburg. Port infrastructure is also being upgraded to handle more fuel shipments, both inland and around the coast. An amount of R300 million has been invested in widening and deepening the Durban harbour entrance, and upgrading the berths.

Additional investment is needed for oil refineries to adapt production processes to meet cleaner fuel standards. The national oil producer, PetroSA, is investigating further exploitation of gas fields off the coast to provide feedstock for the gas-to-liquids Mossel Bay Refinery. This would prolong the facility's useful lifespan and help diversify the country's energy sources.

Monitoring of demand trends, and production and import capacity, is important to ensure predictable supply of hydrocarbon fuels

Monitoring of demand trends, and the oil and gas industry's production and import capacity, is important to ensure predictable supply. South Africa's reliance on imports of refined fuel and recent shortages of bitumen (a key ingredient in road building) underline the importance of coordinated investment and logistical arrangements in the sector. Government will need to work closely with industry to ensure alignment of supply and demand.

Water and sanitation

South Africa is a "water-stressed" country: not only does it have a limited amount of available water resources, but there is also insufficient capacity and quality of the infrastructure required to capture and distribute water to households and industry. Agriculture, mining and electricity generation are all dependent on large-volume water supply.

Major water investments benefit households, power stations, mines and industry in several provinces

Government has increased investment in this sector in recent years and plans several large projects over the next two decades. The Trans-Caledon Tunnel Authority, the state-owned entity responsible for project financing and construction, is undertaking large investments. These include the Komati water scheme augmentation projects, which will provide water to Eskom's power stations; phase 2 of the Lesotho Highlands water project, which will augment water supply for domestic and industrial users in Gauteng; and the Olifants River water resources development project, which will provide water for domestic use to semi-urban and rural communities in Limpopo, and will support new mining projects that boost economic development.

R75 billion allocated to water infrastructure, quality management, planning and local government support

Over the MTEF period, R75 billion is allocated to water infrastructure, quality management, resource planning and support to local government. Improved billing, revenue collection and more cost-reflective pricing will support greater capacity for investment in distribution networks and local connections. To this end, the Department of Cooperative Governance will spend R599 million over the medium term to support municipal infrastructure management.

On current projections, South Africa's water demand will outstrip available supply between 2025 and 2030. Avoiding this outcome requires better management and adjusted pricing mechanisms to support efficient and sustainable use of water. The Department of Water Affairs plans to review the water pricing strategy in 2013.

Independent water sector regulator under consideration

Adequate access is only one part of the equation: water supply must also adhere to quality standards. While 97 per cent of South Africa's drinking water meets minimum standards, only 71 per cent of wastewater is compliant, and the quality of the latter shows some deterioration. To address these issues, government is developing a national water resource management plan, looking at institutional reforms to bolster service providers, and the possible introduction of an independent water sector regulator to set prices at each stage of the value chain. Government has also put aside R433 million for short-term interventions to tackle acid mine drainage contaminating the Gauteng water table. Service providers have been procured to identify financially sustainable institutional models for a long-term solution to this problem.

Transport

Transport investments account for 27 per cent of public-sector infrastructure budget over MTEF

Government and state enterprises are expected to allocate funding of R262 billion over the next three years to transport and logistics infrastructure. This includes Transnet's spending on pipelines, and accounts for 27 per cent of the total public-sector infrastructure budget over this period. These investments will improve public transport and the mobility of people and services, overcome spatial inequalities, boost the economic potential of certain regions, and increase domestic and international trade capacity.

Funding these investments will require both support from the fiscus and pricing that better reflects costs. The national and provincial budgets include funding for road construction and maintenance. The fiscus also contributes to the capital costs and subsidises the operations of public transport systems such as Metrorail and bus commuter services. But tax revenue cannot carry the full costs of transport systems. User charges make important contributions both to the fairness and sustainability of transport financing arrangements.

Major projects in roads, rail, ports and airports

Major investments in roads, rail, ports and airports over the MTEF period and beyond include the following:

- The South African National Roads Agency (SANRAL), which is responsible for maintaining and expanding the 16 170km national road network, will spend R25 billion on new roads and infrastructure, and R18 billion on maintenance. Recent non-toll projects include construction of the N4 Nelspruit bypass, rehabilitation of sections of the N2 (Eastern Cape, Western Cape and KwaZulu-Natal), upgrading the R300 in the Western Cape, the N8 Bloemfontein airport interchange and N6 upgrades in the Eastern Cape. SANRAL recently completed phase 1 of the Gauteng freeway improvement project (GFIP), which will be funded by a combination of tolls and a contribution from the fiscus (see Chapter 8). Options for phase 2 of the GFIP and other toll projects such as the N1/N2 Winelands upgrade and the N2 Wild Coast highway are being assessed. In addition to SANRAL expenditure, private firms such as N3TC (for the N3 toll road) and Bakwena (N1 and N4 toll roads) maintain the roads under their concessions.

- Provinces will spend a projected R25.5 billion to maintain provincial and rural roads. Funding is also provided to rural municipalities to develop road asset management systems.
- Transnet is planning to invest about R300 billion over the next seven years, of which R107.7 billion is included in approved plans over the MTEF period. These investments focus on the freight rail network, large capacity upgrades on the iron ore and coal export lines, acquiring modern rolling stock and refurbishing existing infrastructure. The increased capacity will boost general freight and mining exports. The Saldanha port's handling capacity will be expanded to accommodate increased iron ore throughput. Investments in the Richards Bay port will increase bulk export and cargo capacity.
- The Passenger Rail Agency of South Africa (PRASA) has begun a long-term project to renew its fleet of rolling stock and upgrade stations nationwide. The cost of the 20-year programme exceeds R80 billion, with a projected R4 billion to be spent over the MTEF period. These investments will improve reliability and safety for the 2.4 million passengers who travel on the network each work day.
- The bus rapid transport systems that began operating in Johannesburg and Cape Town in 2010 continue to be expanded. Nelson Mandela Bay has completed plans for its public transport network and has purchased a fleet of buses; Tshwane, Rustenburg and eThekwini are finalising their operational plans.
- Over the past two years the Airports Company South Africa (ACSA) completed the King Shaka Airport in Durban and carried out major upgrades at OR Tambo in Johannesburg and Cape Town International. These investments have improved South Africa's ability to handle growing numbers of travellers and freight volumes. Projected investments to support other airport upgrades amount to about R2.9 billion over the 2011/12 to 2013/14 period.

Telecommunications

Recent investment has focused on upgrading broadband internet

While progress has been made in expanding access, South Africa is some way from achieving the goal of high-quality, affordable telecommunications accessible to all. Progress in this area, which is crucial for building a modern economy, requires additional investment and improved regulation. Recent investment has focused on upgrading broadband internet, and mobile and land-based telephone infrastructure. Increased competition has begun to lower costs to consumers.

The private sector is the major provider of telecommunications services. Service providers have expanded their land-based and wireless networks, and increased international connections via submarine cables. Broadband capacity has grown and become more affordable, reflected in the growth of internet users from 5.3 million in 2009 to 9.5 million in 2011.

State investment supports connectivity for large scientific and research projects

The public sector provides additional investment to accelerate access and service provision. State-owned Infraco has committed over R1 billion in capital investment to support the West Africa Cable System, increase service provision in rural areas, and ensure sufficient connectivity for projects such as the Square Kilometre Array, the South African Large Telescope and the South African National Research Network. Sentech plans to spend R1.3bn over the MTEF period, largely to digitise the television broadcasting network by December 2013.

Human settlements

As demand for housing increases, higher building and land costs are slowing the pace of delivery

Providing affordable housing and addressing the spatial disparities of South Africa's urban landscapes are policy priorities. More than 3 million housing units have been delivered since 1994, but there is a remaining backlog estimated at 2.1 million houses. Population growth trends, including continued urban-rural migration patterns, put pressure on cities to adapt and expand infrastructure quickly. Nearly 70 per cent of the housing backlog is in urban areas. While demand is increasing, the pace of delivery has declined, partly due to higher building and land costs.

The persistence of large informal settlements has necessitated a shift towards developing serviced sites, security of tenure and affordable rental housing. To support this outcome, R50.5 billion is allocated for low-income housing and upgrading informal settlements in secondary cities, as well as R27 billion for upgrading informal settlements in large cities over the next three years.

Over the medium term, accountability for housing will shift from provinces to metropolitan municipalities

Coordinating the installation of bulk services is a complex matter that requires comprehensive planning and cooperation between national, provincial and local government. This needs to be improved to achieve higher rates of delivery. A shift of accountability for housing from provinces to metropolitan municipalities is in progress, and should be completed over the MTEF period. This will allow for better alignment in the planning and implementation of residential infrastructure and housing projects.

Special economic zones

Special economic zones intended to promote widespread industrialisation

The Department of Trade and Industry recently released a draft bill on special economic zones. As part of the economic competitiveness enhancement package, government has allocated R2.3 billion over the MTEF period to support business investment in targeted economic zones. This initiative broadens the present industrial development zone framework, which is limited to regions adjacent to international airports (OR Tambo) or sea ports (Coega, East London and Richards Bay). The special economic zones will promote exports and more widespread industrialisation. The cluster developments are intended to attract manufacturers by providing high-quality infrastructure, incentives and support services, with minimal red tape.

Improving infrastructure delivery

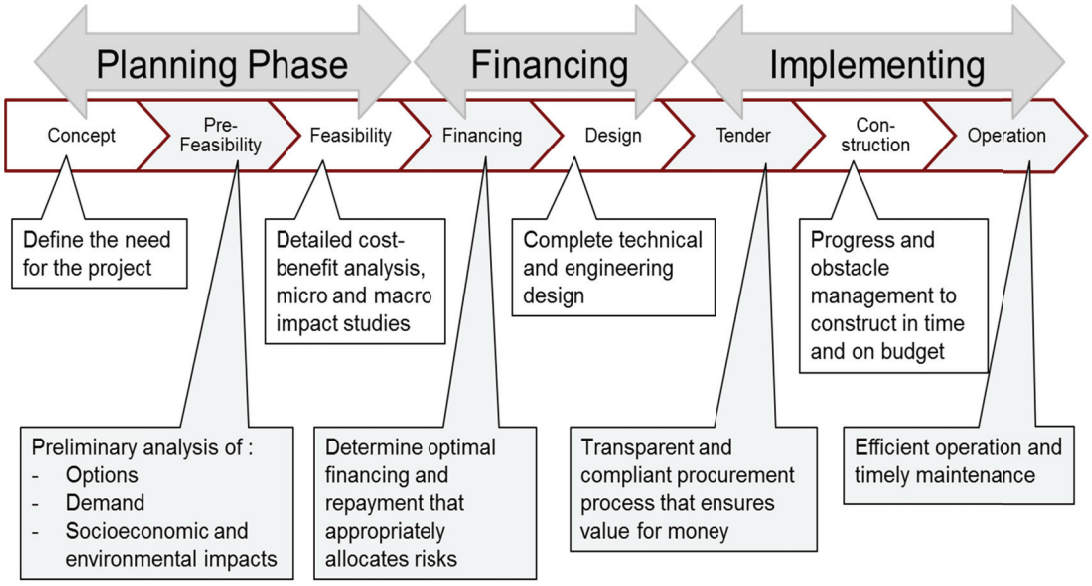
The President's State of the Nation address set out a vision for taking forward a large-scale infrastructure development drive. It outlined a pipeline of projects that are geographically and economically related, and organised into clusters, with sequenced project schedules and prioritised according to their strategic and economic importance.

South Africa has the ability to implement large projects, but many public entities struggle with planning and expenditure

The record of infrastructure investment to date demonstrates that South Africa can assemble the capacity to implement large, complex projects, yet many public entities struggle to manage their planning responsibilities or spend their capital budgets. Institutional capacity to plan, deliver and maintain infrastructure will be strengthened across the public sector as government accelerates its investments.

The National Planning Commission has highlighted that better outcomes will be achieved through coordination of integrated development approaches. This would involve a range of interested parties, from business to provincial and local governments.

Figure 7.2 The phases of project development



Source: National Treasury

Planning, assessing and prioritising

Infrastructure projects are designed to meet South Africa's long-term economic and social needs

Infrastructure projects produce short-term benefits, such as boosting the construction and supplier industries, with an associated increase in employment. The real value of capital projects, however, is in the economic and social development they enable over the long term – including lower business costs, improved access to markets and increased productivity. Every project needs to be assessed on its own merits. Projects that are not properly assessed or planned will not create lasting value for the country.

Many public-sector infrastructure projects are now in the first phase of planning, which includes verifying the concept, and undertaking pre-feasibility and feasibility studies.

Appraising infrastructure projects

South Africa needs to make prudent infrastructure investment decisions. Concept proposals will always exceed available resources. To get value for money, project appraisals need to take account of the following:

- **Context** – A project should make a large contribution to support the economy or promote quality of life.
- **Demand** – Investments should prioritise projects that demonstrate strong demand for the service.
- **Viability** – Project benefits must offset investment costs and represent value for money.
- **Funding the cost to society** – The cost-recovery burden needs to be fairly distributed, with allowances made for assistance to low-income households. Users should pay where they benefit, and taxpayers should contribute where benefits extend beyond the users, or when affordability hampers the delivery of basic rights and services.
- **Delivery mechanism** – Capital projects need to be backed by sound institutional arrangements that have an appropriate mandate, proper incentives and the capacity to deliver.

Capital planning guidelines

The National Treasury publishes capital planning guidelines each year for departments submitting infrastructure proposals. The guidelines are designed to promote efficiency in planning and budgeting, and to ensure that funding is directed to projects that offer maximum social and economic benefits. Large and mega-projects will now be evaluated throughout the year. Appraised projects that are ready for funding can be submitted for consideration of a budget allocation.

Table 7.4 Public-sector infrastructure expenditure by area of responsibility, 2008/09 – 2010/11

	2008/09			2009/10			2010/11		
R million	Budget	Actual	Percent-age spent	Budget	Actual	Percent-age spent	Budget	Actual	Percent-age spent
National departments	5 408	4 882	90.3%	6 382	5 717	89.6%	5 813	5 799	99.8%
Provincial departments	41 163	34 094	82.8%	41 185	37 280	90.5%	45 649	39 083	85.6%
Local government	46 518	39 577	85.1%	47 785	39 625	82.9%	42 265	30 945	73.2%
Extra-budgetary institutions	7 633	6 194	81.1%	10 859	8 119	74.8%	11 617	8 671	74.6%
Public private partnerships	4 895	4 942	101.0%	13 751	13 832	100.6%	11 974	7 308	61.0%
Non-financial public enterprises	90 192	103 322	114.6%	125 504	99 064	78.9%	143 087	85 992	60.1%
of which									
Transnet	*19 965*	*19 300*	*96.7%*	*21 912*	*18 400*	*84.0%*	*22 831*	21 500	*94.2%*
Eskom	*47 946*	*43 632*	*91.0%*	*69 395*	*47 524*	*68.5%*	*52 409*	44 325	*84.6%*
CEF	*11 260*	*1 987*	*17.6%*	*9 099*	*1 442*	*15.8%*	*11 672*	*236*	*2.0%*
TCTA	*300*	*651*	*217.0%*	*534*	*290*	*54.3%*	*3 955*	*352*	*8.9%*
ACSA	*5 521*	*5 996*	*108.6%*	*4 983*	*5 241*	*105.2%*	*1 255*	*505*	*40.2%*
Rand Water	*880*	*965*	*109.7%*	*1 000*	*905*	*90.5%*	*1 200*	*1 012*	*84.3%*
Total	**195 809**	**193 011**	**98.6%**	**245 466**	**203 637**	**83.0%**	**260 407**	**177 799**	**68.3%**

Project implementation: a mixed record

Public sector lacks sufficient skills in engineering and project management

The allocation of public resources to infrastructure investment has not always yielded the desired results. As illustrated in Table 7.4, in 2010/11 actual spending was about 68 per cent of budget allocations for government infrastructure projects. This figure, however, masks wide disparities in delivery capacity. Some agencies and municipalities have a strong record of spending implementation; in others, there are serious deficiencies in infrastructure delivery capacity. This reflects the lack of sufficient skills in the public sector, particularly with regard to engineers and project managers.

Cost overruns are a frequent challenge in major infrastructure projects. Examples include the Green Point stadium, Medupi and Kusile,

De Hoop Dam and the Gautrain. Project cost overruns may reflect an inadequate original budget, lack of adequate cost control, project delays or unforeseen extraneous factors.

Table 7.5 Public-sector infrastructure expenditure and estimates by sector, 2010/11 – 2014/15

R billion	2010/11 Budget	2010/11 Actual	2011/12	2012/13	2013/14	2014/15	MTEF Total	Percentage of total
Economic services	**218.0**	**147.1**	**184.0**	**211.7**	**228.3**	**237.1**	**677.1**	**80.2%**
Energy	102.8	52.2	73.1	91.7	100.2	104.3	296.2	35.1%
Water and sanitation	21.0	14.9	22.0	25.5	24.7	25.0	75.2	8.9%
Transport and logistics	80.5	68.6	75.3	81.2	88.6	92.3	262.0	31.0%
Other economic services[1]	13.7	11.3	13.6	13.3	14.8	15.5	43.6	5.2%
Social services	**36.9**	**25.6**	**34.9**	**38.6**	**48.5**	**53.1**	**140.2**	**16.6%**
Health	8.5	6.7	7.7	8.1	13.1	14.8	36.0	4.3%
Education	6.8	6.1	8.1	10.9	14.5	15.3	40.7	4.8%
Community facilities	16.7	11.6	17.5	17.7	18.9	21.0	57.6	6.8%
Other social services[2]	4.9	1.1	1.7	1.9	1.9	2.0	5.9	0.7%
Justice and protection services	**3.1**	**3.0**	**3.2**	**3.4**	**3.5**	**3.7**	**10.6**	**1.3%**
Central government and administative services	**2.0**	**1.7**	**3.8**	**7.9**	**3.5**	**2.8**	**14.2**	**1.7%**
Financial services	**0.1**	**0.3**	**0.7**	**0.7**	**0.7**	**0.9**	**2.4**	**0.3%**
Total	**260.1**	**177.8**	**226.6**	**262.3**	**284.6**	**297.6**	**844.5**	**100.0%**
% of GDP	*9.4%*	*6.5%*	*7.6%*	*7.9%*	*7.9%*	*7.4%*		

1. Other economic services includes agriculture and environmental infrastructure, telecommunications etc
2. Other social services includes infrastructure such as labour centres, heritage institutions, national libraries, etc

Improving infrastructure maintenance

Maintenance of infrastructure requires considerable improvement. According to the second "infrastructure report card" released in 2011 by the South African Institute of Civil Engineers, some sectors are performing better than others. The report indicated an overall improvement since the 2006 assessment (2011: C-, 2006: D-), which reflects accelerated public investment over the past five years and an improvement in the condition of some assets.

Report cites a need to improve maintenance, particularly in municipalities

The report points out that municipal infrastructure is deteriorating in many places. Bulk water facilities, particularly in small towns and rural areas, sanitation in many municipalities and provincial and rural roads are particular areas of concern. The report gives high marks to South Africa's major airports, and points out that national roads are generally in good repair, and freight rail and port infrastructure are satisfactory.

The report identifies the following as matters of critical importance:

- The severe shortage of skills and the impact this has on planning, procurement, design, construction and maintenance.
- Inadequate funding of maintenance for the existing asset base and new assets that are being developed.
- The practice of not charging true economic costs of infrastructure.

Improving project management capacity

Making use of the project management expertise gained and lessons learnt in preparing for the 2010 soccer World Cup will support

infrastructure development. A key element of the approach was the role of a coordinated structure dedicated to planning and overseeing implementation of interlinked sub-projects. These arrangements ensured that deadlines were met.

World Cup experience showed importance of project and risk management, cost control, skills and communication

The following considerations were central to the success of World Cup infrastructure projects:

- Expert conceptual, project management and project execution skills to increase the pace of delivery
- Use of effective management tools to bring discipline to programme oversight, including role and responsibility matrixes, budget and delivery schedules, cash-flow tracking and regular tender reviews
- Pre-emptive risk management to allow early resolution of difficulties
- Tight cost control and ring-fenced accounts to track monetary flows
- Solution-oriented specialists capable of making strategic decisions
- Continuous communication.

Getting the financing mix right

Budget emphasises a shift from current to capital expenditure

As discussed in Chapter 3, the fiscal framework and projected public-sector borrowing requirement take into account rising infrastructure finance requirements, particularly in energy and transport, while maintaining a sustainable outlook for public debt.

Financing options

There are various ways to finance public infrastructure:

- **Financing from fiscal revenues**, in which construction costs are paid from current or future tax revenues of national or local government. Generally, such financing would be considered for projects that promote redistribution, offer large external benefits to society, address market failures or provide services considered to be constitutional rights in poorer communities, such as education or rural roads.
- **Public entities** finance infrastructure from internal reserves and debt raised in the capital markets. Repayment requires that sufficient revenue can be generated from user charges to cover the capital, operation and maintenance costs. State-owned enterprises and development finance institutions play an important role in expanding the number of projects that can be financed and delivered.
- **Hybrid financing,** in which taxpayer contributions supplement funding for projects implemented by public entities. This is often used to ensure that poor communities have access to essential services normally paid for through user charges. Examples include water infrastructure connections for households that are financed partly on the national budget, with user charges for consumers.
- **Private-sector participation** augments the state's capacity to build and operate infrastructure. Public-private partnerships place the risk and responsibility for infrastructure development with the private sector, while retaining long-term public ownership. The private sector also makes a significant independent contribution to infrastructure funding in telecommunications, airlines, mining, small energy projects and community services, such as hospitals and education institutions.

Raising finance

Options to raise debt or equity for infrastructure include commercial banks, capital markets and development finance institutions.

The allocations for the MTEF period reflect projects that have been assessed and subsequently approved by accounting officers. These projects will receive budgeted funds.

Building capacity

As noted from the World Cup experience, the inclusion of experienced engineers, project managers and other delivery experts will help to ensure better planning, assessment and implementation of projects. Training programmes continue to receive significant resources, while leadership programmes, mentoring schemes and opportunities for on-the-job learning are in place to ensure the appropriate acquisition and application of skills.

Various government programmes are working to build infrastructure implementation capacity

This is complemented by the following infrastructure-specific capacity building initiatives:

- The infrastructure delivery improvement programme assists national and provincial departments with finance, training and technical assistance in planning, procurement, and project management. The programme team includes the National Treasury, the Development Bank of Southern Africa and the Construction Industry Development Board, supported by 45 technical assistants. Since its inception, R255 million has been spent on the programme, which will spend about a further R98 million a year over the MTEF period. The national and provincial departments of Education, Health, Public Works and provincial treasuries are currently benefitting from the programme. Several of these departments have set up dedicated infrastructure units. Assistance has been provided to the national Department of Education to develop a standardised approach to costing the construction of schools, which facilitates large-scale multiple-school building programmes and contracts.
- The cities support programme, now under consideration, is designed to help cities with governance, spatial planning, public transport systems and environmental management – initially in eight metropolitan cities.
- The municipal infrastructure support agency is being set up by the Department of Cooperative Governance. It will deploy technical experts to assist rural municipalities that lack planning capacity.
- The *infrastructure skills development grant* provides funding to train interns in engineering and spatial planning. Since 2011/12, the grant has paid for 150 graduates at six large municipalities and water boards. The grant will be extended to 43 smaller municipalities over the period ahead. Funding of R281 million is allocated over the medium term, providing for over 1 000 graduates to be trained.
- The neighbourhood development programme aims to assist the development of townships by supporting well-planned capital projects. A cumulative R10 billion grant is committed to over 150 townships. It has more than 220 approved project plans with a value of R4.3 billion, and planned infrastructure spending over the MTEF period of R1.8 billion. Investment focuses on developing economic nodes and corridors, small business facilities, transport and utility infrastructure, parks and community facilities.

Building rigorous oversight capacity is part of ensuring public accountability

Building rigorous oversight capacity is critical to ensure that services are being delivered as intended. This will open the way for greater problem-solving to keep projects on track through all stages of the project cycle. It is also required to enforce public accountability among all parties responsible for or involved in service delivery. This will be supported by putting in place more robust operational processes and regulatory functions, bolstering risk management, stiffening penalties and encouraging continued learning from experience.

Conclusion

Improved planning and management, alongside greater private-sector involvement, will support implementation

Government is investing on a large-scale to provide water, transport, electricity, telecommunications, housing and other infrastructure. These investments will remove critical bottlenecks and allow the economy and employment to grow at a more rapid pace; they will facilitate intra-regional and international trade; and they will allow South Africans to enjoy a better quality of life. Improved planning and management of infrastructure projects are critical if these outcomes are to be achieved, alongside accelerated private-sector investment.