The State of South Africa's
Economic Infrastructure:
Opportunities and challenges 2012

THE PRESIDENCY
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DEPARTMENT: PERFORMANCE MONITORING AND EVALUATION

DBSA
Development Bank
of Southern Africa

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Foreword: Minister in the Presidency: Performance Monitoring and Evaluation as well as Administration

Bold steps have been taken by President Zuma and his administration in placing infrastructure at the forefront of government's agenda to transform the economy and stimulate economic growth and job creation.

In September 2011, the Presidential Infrastructure Coordinating Commission (PICC) was inaugurated, bringing key ministers, premiers and metro mayors for the first time into a joint forum to promote infrastructure coordination and decision making, headed by the President and assisted by the Deputy President.

Resulting from PICC work, plans for future projects and infrastructure initiatives from a large number of authorities such as state-owned enterprises, national, provincial and local government departments, have been clustered, sequenced and prioritised into 17 strategic integrated projects (SIPs).

Together these SIPs unlock the economic development of South Africa and maximise the returns on our infrastructure investment in the form of increased jobs, growth and economic potential. This will be a continuous process, creating a 'pipeline' of projects into the future that gives substance to the long-term National Development Plan and certainty to South Africa's infrastructure development.

South Africa now has a coordinated national infrastructure plan which was launched by President Zuma in his State of the Nation Address in February 2012. Individual SIPs will be launched, organisational structures and systems put in place, and project content further developed, tested and refined in consultation with stakeholders.

Other important areas of work will include a focus on infrastructure skills, supply of materials, localisation, governance, project management, creating enabling legislative and regulatory conditions, implementation monitoring, and institutional structures and arrangements.

This State of Infrastructure Report is an important step in taking stock of how far we have come in developing our country, what the trends and challenges are, and what we still need to do going forward.

This review of our key economic infrastructure by independent experts has been commissioned by the Presidency: Department of Performance Monitoring and Evaluation (DPME) to critically analyse the various sectors in order that observations and recommendations are available for the PICC, the DPME, and sector departments and public entities to take into account in their important decision and delivery work going forward.

Whilst the views and recommendations of independent experts are not necessarily those of the various parts of government, a fresh view from a different perspective is always welcome in our democracy, and assists us in thinking outside our existing paradigm. Our congratulations and appreciation goes to the organisers, the sponsors, the experts and the editors in putting together this publication, the first of its kind, and hopefully not the last.

Collins Chabane

Minister in the Presidency: Performance Monitoring and Evaluation as well as Administration

Foreword: DPME: Outcome 6

On 29 October 2010, the Delivery Agreement for Outcome 6 on Economic infrastructure was signed by the relevant sector Ministers. It heralded for the first time in South Africa, a written promise of a government to deliver to its people a defined set of deliverables in the economic infrastructure sectors within the term of office of this administration. Indeed the signing of the 12 outcomes had given effect to a "whole of government" approach to planning and substance to the "working together we will do more" campaign slogan of the elections of 2009.

Months before the signing, officials of the departments of Transport, Public Enterprises, Energy, Communications, Water Affairs and the Presidency: DPME had worked tirelessly to pin down the baselines, outputs, activities, indicators, targets, responsibilities and resources that formed the crux of the delivery agreement and its appendices, which are included in this report.

The delivery agreement process is not static... it continues. Regular improvements to the delivery agreement are built into the outcomes approach, and the next iteration of the Outcome 6 delivery agreement is due. It will take into account the NPC's National Development Plan recommendations on infrastructure, as well as the PICC national infrastructure plan. It will further analyse the existing delivery agreement, looking critically at what worked and what didn't and incorporate necessary changes into the new delivery agreement.

This State of Economic Infrastructure Report, consisting of analyses by independent experts was commissioned by the Presidency: DPME to serve as food for thought for Outcome 6 cluster departments in crafting the next iteration of the delivery agreement, in our quest to take infrastructure forward.

Let me take this opportunity in thanking the DBSA for sponsoring and partnering this work, the independent experts for their fearless criticism, the editors for their thankless hard work, and departmental and entity officials who cooperated with useful information and guidance.

Mahesh Fakir

Deputy Director General: Outcomes Facilitation – Infrastructure
Department of Performance Monitoring and Evaluation, Presidency

Foreword: DBSA

This report is a product of the collaboration between the Development Bank of Southern Africa (DBSA) and the Department of Performance Monitoring and Evaluation (DPME).

The DBSA believes that knowledge, in combination with financial and human capital, can lead to high-impact interventions and sustainable development. Improved infrastructure, in turn, contributes to economic growth and to raising the quality of life of our people.

This report reviews the current state and related challenges in six of South Africa's economic infrastructure sectors. It highlights the renewed focus that is being placed on infrastructure development in South Africa. The government has committed substantial resources to infrastructure development and has established several integrated planning initiatives to provide direction. Furthermore, mechanisms are being designed to improve oversight of public institutions responsible for implementing infrastructure development. All these intentions will be rendered useless unless South Africa successfully implements the improvement plans. The DBSA values the synergy that was created through this partnership for improving infrastructure delivery.

The DBSA remains committed to work with government and other stakeholders to implement the national development agenda and related infrastructure programmes. We hope that this report will contribute towards accelerated and focused delivery of infrastructure in support of a competitive and inclusive economy.

The DBSA would like to thank the DPME for the opportunity to work together on the preparation of this report. Furthermore, a special word of thanks is extended to everybody who contributed to making it a reality; development is co-created through collective efforts.

Ravi Naidoo

Group Executive: Development Planning Division

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The implementation of the project has been under the joint management of the DBSA and the Presidency: DPME; and overall responsibility has been with:

- Mohammed Jahed: Divisional Executive – DPD, DBSA; and
- Mahesh Fakir: Deputy Director General – DPME, Presidency (Outcomes Facilitator: Outcome 6)

The report is based on input papers prepared by specialists in the six economic infrastructure sectors:

- Ports: Andrew Marsay
- Rail: Andrew Marsay
- Roads: Nicolaas van Zyl
- Water: Godfrey Mwiinga
- Electricity: Ruse Moleshe
- ICT: Arthur Goldstuck

Further insights were gained and refinements made to the report after workshop sessions were held with knowledgeable key stakeholders. The presentation made to the Infrastructure Cluster in December 2011 was particularly beneficial. In this regard thanks are due to the directors general (DGs) and senior staff of the various infrastructure departments. In finalising the report, the team has included the guidance and suggestions from both the National Treasury and the DPME (Presidency) – Outcome 6, as well as from members of the Development Planning Committee of the DBSA Board.

The overall structuring, finalisation and editing of the report was undertaken by a DBSA team of:

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The report could not have been produced without the unstinting support from the DBSA publications team of Mariè Kirsten, Rose Ngwenya and Lyn Sumners.

1 Infrastructure as an enabler of development

Infrastructure lies at the heart of the stimulatory fiscal package of the South African government and is pivotal to the New Growth Path

Introduction

Governments around the world rank infrastructure policy among their greatest concerns. The modernisation of infrastructure is seen as being critical to future economic competitiveness and crucial to accommodating expanding populations in urbanising environments (Urban Land Institute and Ernst and Young, 2011).

South Africa is no exception: infrastructure lies at the heart of government's stimulatory fiscal package and is a pivotal component of the New Growth Path (Department of Economic Development, 2010), accounting for just less than 8% of GDP in the 2012/13 fiscal year. The Department of Performance Monitoring and Evaluation (DPME) in the Presidency and the Development Bank of Southern Africa (DBSA) collaborate on performance monitoring and evaluation of infrastructure delivery.

The DBSA is a development finance institution that focuses its investment activities on infrastructure funding. The DPME works with partners to improve government performance in achieving desired outcomes and to improve service delivery through changing the way government works. This is done through coherent priority setting and robust monitoring and evaluation related to the achievement of outcomes, including infrastructure development as one of the government's key priorities. The DPME is tasked with facilitating delivery agreements for all infrastructure departments and monitoring their implementation. Both the DPME and the DBSA realised the need for an informed view on the state of infrastructure development and related challenges; hence this report.

This report reviews the current state of South Africa's economic infrastructure. The discussion encapsulates the challenges confronting the efficient operation of existing infrastructure assets and their expansion in the future. Significantly, the expansion of both social and economic infrastructure lies at the heart of the government's stimulatory fiscal policy to drive growth over the next three years.

This chapter argues that infrastructure development is an enabler of socio-economic development; it provides a framework for the governance of infrastructure development, illustrates that a renewed focus is being placed on infrastructure development in South Africa, and concludes that state capacity is a pivotal determinant of successful infrastructure development. An outline of the rest of the report is provided at the end of the chapter.

Governance of infrastructure development

State capacity to deliver and effectively maintain infrastructure is grounded in the following functions of a democratic, market-based economy such as South Africa's:

- The state's ability to collect tax and user charge revenue, as this determines the quantum of resources available for infrastructure investment;
- Allocative efficiency, which in turn depends on the state's capacity for integrated planning across different infrastructure sectors;
- The efficacy with which programmes are implemented and delivered to the targeted beneficiaries (including the management of public finance, procurement processes, contract management and effective monitoring of state-owned enterprises (SOEs));
- Effective oversight and regulation of public and private entities that provide infrastructure, and associated services.

Notably, all these capacities rely on the strength of the public institutions tasked with implementing them. If any of the four capacities are inadequate, infrastructure delivery will be compromised. This also applies to the complete cycle of project development including inception, implementation, operation and management, maintenance, and the refurbishment and replacement of infrastructure assets.

Levy (2007) argues that the macroeconomic impact of an infrastructure project can be significantly reduced by governance failures, even if the project itself is carefully chosen, well designed and corruption free. Hence, macro-level responses such as fiscal reform for transparency and a development focus in budgets, civil service reforms including competitive selection and merit-based pay, reform of general procurement rules and auditing standards, legal reform, and increased freedom of information will enhance the pace and quality of infrastructure delivery.

A prominent issue in the literature on state investment in infrastructure in developing countries is the extent to which the resources allocated to infrastructure become diluted during the implementation process, as a consequence of both poor management and corruption. Kenny (2007:1) argues that "Governance is central to development outcomes in infrastructure, not least because corruption (a symptom of failed governance) can have a significantly negative impact on returns to infrastructure investment."

Furthermore, empirical evidence from across the world provides important insights into the requirements for effective state investment and delivery of infrastructure. This literature focuses on the relationship between state investment in infrastructure and economic growth. The most comprehensive of these studies (Kessides, 1993), which examines a wide range of evidence on the impacts of infrastructure on economic development, draws the following conclusions:

- Infrastructure contributes to economic growth, through both supply and demand channels, by reducing costs of production, contributing to the diversification of the economy and providing access to the application of modern technology, thus raising the economic returns to labour (by reducing workers' time in non-productive activities or improving their health).
- Infrastructure contributes to raising the quality of life by creating amenities, providing consumption goods (transport and communication services), and contributing to macroeconomic stability.
- Infrastructure does not create economic potential; it only develops it where appropriate conditions (i.e. other inputs such as labour and private capital) exist.

The same study then argues that there are four necessary conditions to realise the positive impacts of infrastructure investment on economic development:

- A macroeconomic climate conducive to efficient resource allocation, avoiding distortions in service provision, inflationary funding arrangements and 'crowding-out' of other more rewarding investments;
- The presence of sufficient other input factors (such as labour) to raise factor productivity in the presence of infrastructure, because infrastructure cannot create economic potential, only develop it where appropriate conditions exist;
- An orientation to economic demand considerations such as service prices and demand elasticity, not just projections of physical capacities and consumer needs, because *infrastructure with the most enduring benefits is that which provides the reliability and quality of services that users need*; and
- Application of user charges that reflect supply and demand conditions and non-market externalities as far as possible, to ensure infrastructure will be more economically efficient and favourable to the environment.

These four conditions have the following implications for investment planning and policy analysis in South Africa:

- Planning of supply should consider all possible alternatives, including demand management, to generate the services demanded — as opposed to quantitative projections of physical need (including shifts at the margin between large scale infrastructure services and smaller scale alternatives).
- Choosing between options for national benefit requires a cost-benefit analysis.
- In practice, a demand orientation in both evaluation and operation of infrastructure investments requires performance indicators that reflect the quality of service and user satisfaction, not just measures of physical assets and financial performance.

Critically, the failure to deliver the infrastructure required for the economy to grow, will effectively act as a brake on an inclusive growth path in South Africa. Indeed, a study on the relationship between investment in infrastructure and economic development found that poor quality or unreliable infrastructure services, or insufficient infrastructure service provision, mean that firms may be reluctant to invest, or where established, may invest in "complementary capital" (i.e. provide their own infrastructure services) rather than "productive" capital, thereby lessening the rate of return on private investment (Reinikka and Svensson, 1999).

A renewed focus on infrastructure development in South Africa

Given the pivotal role of infrastructure in driving a new growth path, alongside the recognition that there are gaps in state capacity for infrastructure delivery, the South African Government has established several institutions to strengthen state capacity for infrastructure delivery:

- The *Department of Performance Monitoring and Evaluation* in the Presidency, tasked with facilitating delivery agreements for all infrastructure departments and monitoring their implementation;
- The *National Planning Commission*, located in the Presidency, tasked with developing a long-term vision and strategic plan for South Africa, alongside advising Cabinet on cross-cutting issues that impact on South Africa's long-term development. Infrastructure is one of the key issues addressed by the commission;
- The newly created *Presidential Infrastructure Coordination Commission* headed by the President, that will coordinate and oversee the implementation of strategic infrastructure projects that stimulate social and economic growth;
- The *Presidential Review Committee on State-owned Enterprises (SOEs)* that aims to align SOEs with the government's development agenda, including that of infrastructure development.

These institutions will play a decisive role in driving infrastructure delivery in South Africa. To illustrate the role they are currently playing, the Delivery Agreement for Economic Infrastructure is reproduced in this report as Appendix A.

As illustrated in Table 1, over the medium-term expenditure framework (MTEF) period, i.e. 2012/13–2014/15, public-sector project estimates total R844.5 billion. The economic infrastructure of rail, ports, roads, electricity, water and telecommunications constitutes a substantial proportion (80%) of estimated future infrastructure spend.

Table 1: Public-sector infrastructure expenditure estimates by sector, 2010/11–2014/15

R million	2010/11	2011/12	2012/13	2013/14	2014/15	MTEF Total	Percent of Total
Economic services	**147 076**	**183 996**	**211 655**	**228 315**	**237 094**	**677 063**	**80.2**
Energy	52 231	73 062	91 715	100 180	104 268	296 163	35.1
Water and sanitation	14 883	22 038	25 456	24 728	25 034	75 217	8.9
Transport and logistics	68 614	75 273	81 167	88 584	92 292	262 044	31.0
Other economic services[1]	11 349	13 623	13 317	14 823	15 500	43 639	5.2
Social services	**25 646**	**34 893**	**38 577**	**48 487**	**53 131**	**140 195**	**16.6**
Health	6 727	7 671	8 051	13 127	14 808	35 985	4.3
Education	6 147	8 067	10 873	14 533	15 320	40 727	4.8
Community facilities	11 624	17 474	17 714	18 880	21 006	57 600	6.8
Other social services[2]	1 149	1 681	1 939	1 946	1 996	5 882	0.7
Justice and protection services	**3 007**	**3 223**	**3 392**	**3 542**	**3 713**	**10 647**	**1.3**
Central government and administrative services	**1 744**	**3 817**	**7 923**	**3 478**	**2 779**	**14 180**	**1.7**
Financial services	**325**	**706**	**719**	**749**	**921**	**2 388**	**0.3**
GRAND TOTAL	**177 799**	**226 635**	**262 265**	**284 571**	**297 637**	**844 473**	**100.0**
GDP	**2 754 275**	**2 995 530**	**3 301 374**	**3 622 155**	**3 997 026**		
% of GDP	**6.5**	**7.6**	**7.9**	**7.9**	**7.4**		

Source: National Treasury Budget Review (2012:103)

Notes: 1. Other economic services include agriculture and environmental infrastructure, telecommunications, etc.

2. Others social services include infrastructure like labour centres, heritage institutions, national libraries, etc.

Given the imperative of addressing basic needs, the focus of the democratic government in the first fifteen years was to roll out social infrastructure. Consequently, the focus for the next ten years is to also redress economic infrastructure backlogs and inadequacies which have become a constraint to economic growth. Indeed, the National Treasury argues that: "South Africa's critical infrastructure needs are in part the outcome of two decades of underinvestment [...] 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" (National Treasury Budget Review, 2012:92).

Of importance to the analysis of economic infrastructure in this report, is the institutional framework for the implementation of various infrastructure projects. As illustrated in Figure 1, the vast majority of public infrastructure expenditure emanates from non-financial public enterprises (with Eskom and Transnet accounting for the largest proportion), followed by provincial and local government.

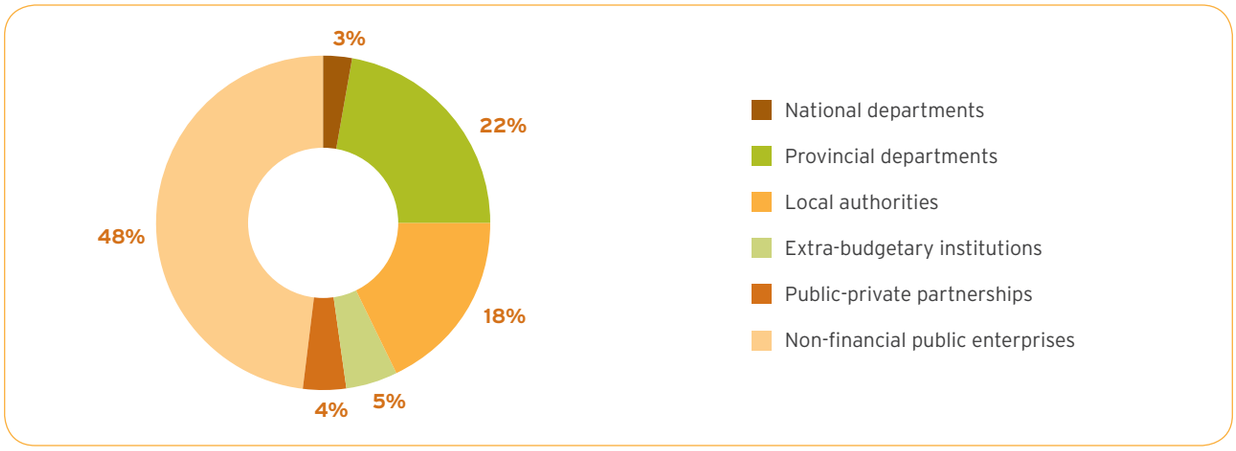


Figure 1: Government's infrastructure expenditure 2010/11

Source: National Treasury Budget Review (2012:102)

It is significant that in 2010/11 infrastructure expenditure was substantially below what was expected at the beginning of the fiscal year – with the exception of national departments – as illustrated in Figure 2.

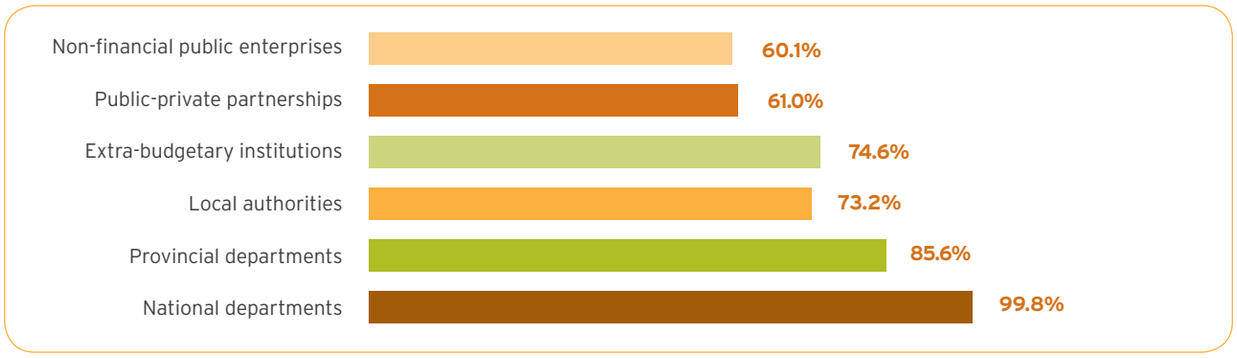


Figure 2: Actual infrastructure expenditure as a % of budget, 2010/11
Source: National Treasury Budget Review (2012:102)

The National Treasury (2012) highlights the fact that while the South African state has demonstrated its ability to deliver large, complex projects, many public entities fail to execute their planning mandates and spend their infrastructure budget (as illustrated in Figure 2, above). Hence government's capacity to plan and execute infrastructure projects looms large as a determinant of their successful implementation.

Outline of the report

The review of six economic sectors (rail, ports, roads, electricity, water and the fibre optic element of telecommunications) illustrates that state capacity is a pivotal determinant of the extent to which infrastructure investment could be an enabler of an inclusive growth path. This report reviews the prospects economic infrastructure holds for enabling a new growth path, alongside assessing the challenges in each of the six economic infrastructure sectors. To that end, it attempts to answer the following questions for each of the infrastructure sectors:

- What is the extent of infrastructure in the sector, including quality and the efficiency with which the infrastructure is being utilised?
- What are the institutional, legal and regulatory arrangements and how do they impact on pricing, efficiency and capacity for future expansion?
- What are the financing mechanisms for future investment?
- What are the key challenges to expanding economic infrastructure and improving the efficiency of delivery?

The key issues in each of the economic infrastructure sectors are synthesised in Chapters 2–7. Chapter 8 concludes the report with key generic and priority issues across the sectors and highlights why it is crucial that they be consistently and coherently addressed.

2 Rail infrastructure

Photo: Chris Kirchhoff, MediaClubSouthAfrica.com

To plan effectively for the future of the rail sector, consensus is needed on what is expected of the sector, as well as of the industry and institutional structures that will make it possible to achieve future goals

Extent of rail infrastructure

Figure 3 illustrates South Africa's national railway network. The orange lines represent the core network while the green lines indicate the location of the less frequently used branch line network.

Figure 3: National rail network
Source: Transnet Limited (2010a)

The following features of the network are significant:

- The railway network connects South Africa's eight primary sea ports to the hinterland.
- Freight and passenger services share the same tracks, at least on inter-city networks.
- The rail network connects to neighbouring Namibia, Botswana, Mozambique and Zimbabwe (and through Zimbabwe to Zambia). It also runs through Swaziland.

The network comprises almost 21 000 kilometres (km), although there are over 30 000 route km of track – allowing for the fact that some primary routes are double track, or more than double (particularly those tracks close to major cities). The core network consists of 13 000 route km of which some 2200 km are accounted for by commuter rail networks. The remaining 8000 km form the under-used branch line network. About 60% of the network utilises electric power with the remainder being diesel. The commuter network is largely electrified. The inter-city tracks and some urban networks are owned by Transnet. However, the majority of the urban rail infrastructure is owned by the Passenger Rail Agency of South Africa (PRASA).

In terms of the size in route kilometres, South Africa's rail network is similar to those of Poland, Italy, the Ukraine or Mexico. In terms of overall geography and density of rail networks, Mexico has a network most similar to South Africa's. Both countries have their main commercial centres located far from the sea: from Gauteng to Durban (575 km), to Port Elizabeth (1000 km); and from Mexico City to Altamira (500 km), to Manzanillo (800 km). In both countries, the primary role of rail is to connect ports to urban and industrial hinterlands. However, in Mexico, inter-city passenger rail has been discontinued to allow for more efficient freight rail services.

In terms of freight rail, historically South Africa's rail network developed in support of the growth of the mining sector and other heavy cargo industries, as well as large-scale agriculture and forestry. The gold mines in particular have developed extensive private networks serving their own local requirements. In cases where mine traffic is virtually the only freight, the mining companies operate parts of Transnet's branch line network. Many large industrial estates in metropolitan areas have been developed with rail infrastructure linking individual companies to the core network. Very large container rail depots exist in the main ports as well as at City Deep in Gauteng.

As regards passenger rail, within South Africa's metropolitan areas, extended networks of rail infrastructure exist, serving commuter rail services and providing access to stations for inter-city passenger services. The Cape Town, Tshwane, Witwatersrand and eThekwini metropolitan areas all have substantial commuter rail networks. Port Elizabeth and East London have limited commuter services operating on Transnet tracks.

Urban rail infrastructure includes more than just tracks; PRASA owns and operates over 400 stations ranging from busy township commuter locations, to a modern station like Cape Town, to new commuter/stadium access stations built for the 2010 Fifa World Cup, such as Moses Mabhida in Durban and NASREC in Johannesburg.

Historical perspective

The Natal Railway Company opened lines along the Bluff at the port of Durban from 1859 onwards. In the Western Cape, the Cape Town Railway and Dock Company opened a line to Eersterivier, then to Stellenbosch and eventually to Wellington between 1862 and 1863. The Wynberg Railway Company then opened a line from Salt River to Wynberg in 1864.

Although private companies had developed rail infrastructure and operations prior to the 1870s, the lines were all taken over by the colonial authorities who constructed lines to the diamond lands in Kimberley and then to Johannesburg, in the period from 1870 to the 1890s. Lines from Port Elizabeth and East London soon followed.

The Natal and Cape colonial lines and the NZASM (Nederlandsche Zuid-Afrikaansche Spoorweg-Maatschappij) line were taken over by the British military in 1902 at the end of the Anglo-Boer War. The South Africa Act of 1909 and then the South African Railways and Harbours Regulation of 1913 provided a high degree of independent control, albeit within state ownership.

The Regulation, Control and Management Act of 1916 (Government of Union of SA, 1916) gave the South African Railways and Harbours (SAR&H) a mandate to invest in rail infrastructure and services as a means of opening up the industrial and agricultural potential of the country. While its mandate required it to fully cover its costs from revenues, provision was made for the government to fund any major investment deemed to be in the national interest, and not covered by immediate revenues. The combination of financial independence and government support led to the understanding that the interests of the railways were synonymous with the national interest. This understanding persists to this day, especially in the freight sector.

A greater degree of commercialisation of the rail sector was introduced in 1981 when SAR&H was re-constituted as South African Transport Services (SATS). Partial deregulation of road passenger transport in the mid-1980s, followed by deregulation of freight transport in 1988, led to a steep decline in the utilisation of the rail sector, as well as to a decline in investment in rail infrastructure.

The legal succession to the South African Transport Services Act of 1989 (Government of RSA, 1989) changed SATS into a new public company, Transnet, with the South African Government as its sole shareholder. Passenger rail operations was transferred to the South African Rail Commuter Corporation (SARCC) when Metrorail was transferred from Transnet in 2006, to form PRASA.

Finally, in 2009, the long-distance passenger operator, Shosholoza Meyl, was also transferred from Transnet to the newly established Passenger Rail Agency of South Africa (PRASA), bringing together all passenger rail operations. Transnet could then focus exclusively on freight. PRASA became responsible for the subsidisation of Shosholoza Meyl, a cost that was previously cross-funded within Transnet.

The historic relationship between transport infrastructure and economic growth

Evidence of the long-term relationship between expenditure on rail infrastructure and economic growth is an important consideration for assessing the impact of future investment in rail infrastructure. Several studies have sought to quantify the impact of transport infrastructure investment on the national economy (Perkins, 2003; Perkins *et al.*, 2005; and Fedderke *et al.*, 2006). These studies reviewed the long-term relationship between different categories of transport infrastructure and national economic growth between 1875 and 2003. They were subsequently updated in a project commissioned by the national Department of Transport (Marsay, 2008).

The findings of these studies are illustrated in Figures 4 and 5, which compare rail line expansion and railway carrying capacity with GDP growth in South Africa. The graphs are based on per capita measures rather than gross values because these offer a better perspective on the efficiency of the relationship between infrastructure spend and overall economic development.

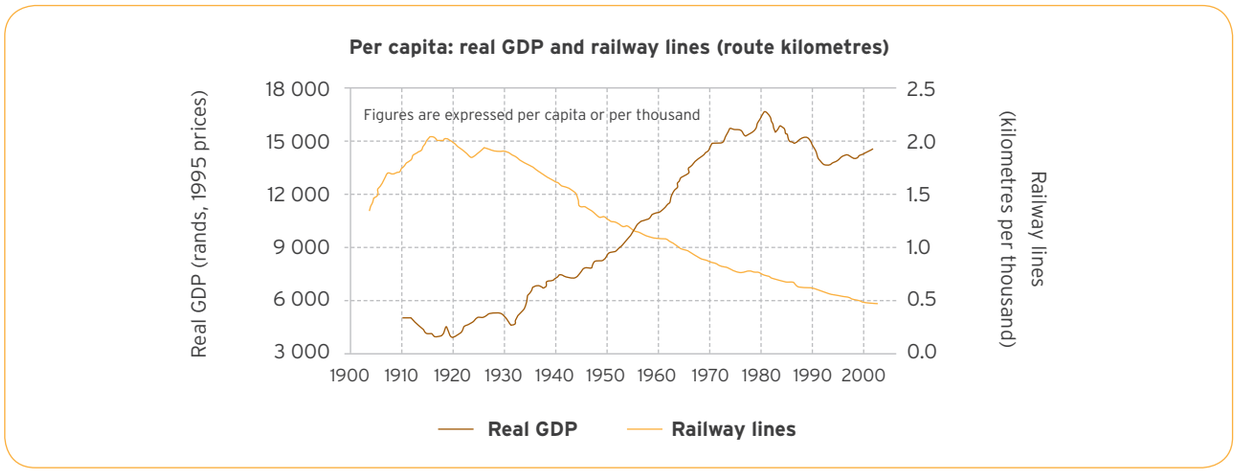


Figure 4: Rail line route km vs GDP, South Africa 1900–2003

Source: Perkins et al. (2005)

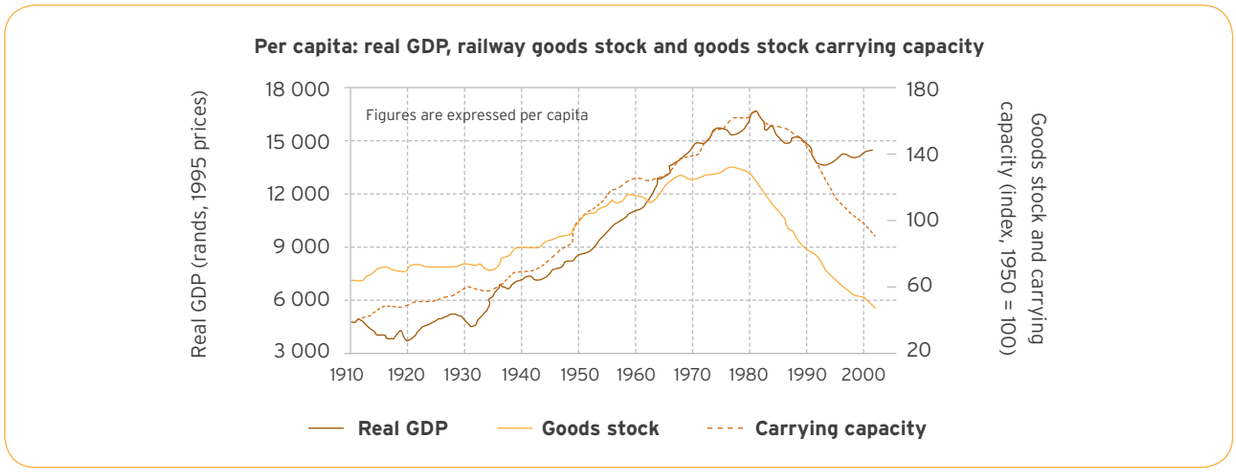


Figure 5: Rail goods stock and carrying capacity vs. GDP, South Africa 1900–2003

Source: Perkins et al. (2005)

The following key issues emerge from the study in relation to rail infrastructure:

- The growth of railway line construction, as measured in route kilometres, grew steeply relative to per capita GDP until 1925. Thereafter it declined. Hence most of the existing 21 000 km network (over 90%) was completed by 1925.
- Investment in railway carrying-capacity, that is rolling stock, continued to grow relative to GDP until the late 1970s, and then declined.
- Although there is a fairly close parallel between rail goods stock and GDP, the rate of growth of this investment relative to GDP growth has been declining since about 1920. This suggests that the economic impact of rail investment declined as continued growth of investment did not result in commensurate growth in rail business.
- While the fall in both GDP per capita growth and rail capacity growth after 1980 coincides with the impact of the sanctions period, deregulation of freight transport took place at about the same time and hence is also a factor in the steep decline in rail use.
- By 2003, neither rail carrying capacity nor goods stock recovered to match the post sanctions recovery in GDP growth. This suggests that GDP growth has become less dependent on rail capacity than it was in the earlier years of economic development.

The studies mentioned note that the growth of investment in rail capacity tends to follow trends of strong economic development rather than lead economic development. The opposite was found for investment in paved roads: from the mid-1920s to the present, growth of investment in roads infrastructure has tended to lead GDP growth.

These findings bring into question the commonly-held view that the decline in the economic impact of rail was caused by declining investment, leading to an 'investment backlog'. The statistical analysis shows that the economic impact of rail was declining even while investment was still rising. When investment in railway carrying capacity did eventually start to fall off in the 1980s, it was more of a symptom than a cause of the rail sector's declining economic impact.

The findings on the different relative economic impacts of rail and road infrastructure investment may be explained by the fact that rail transport technology lends itself mainly to the particular requirements of relatively small numbers of industries or commodities. While the actual users of the railway may benefit from rail transport's generally lower transport costs, the system does not lend itself to the establishment of new smaller and medium sized enterprises.

In contrast, the flexibility and accessibility offered by road infrastructure typically facilitates the development of a much wider range of commercial enterprises, and also allows many more locations to engage in economic activity, than would ever be possible with rail. This impact seems to occur despite the fact that road transport costs are generally higher than rail transport costs.

The historical analysis upon which this conclusion is based does not distinguish among the different categories of rail investment. Some rail sectors perform relatively better than others. For example, there is already a clear trend in the rail freight sector to concentrate on bulk minerals and high volume container transport. In short, directing investment to sectors where rail transport has a 'comparative advantage' will contribute to lower costs for customers and hence enhance economic growth.

Operational issues

The principal operational constraints within the freight and passenger rail sectors in South Africa are the areas in which both Transnet and PRASA seek to improve service delivery within the framework of their respective operational mandates. In support of this objective, the operating mandates set for Transnet and PRASA by the Department of Public Enterprises (DPE) and the Department of Transport (DOT) respectively, are the subject of intensive discussion within the 'Rail Reform' process. Table 2 illustrates the current and book value of the rail assets of Transnet and PRASA.

Table 2: Freight and passenger rail asset values

Company	Book value of assets	Current cost or replacement cost of assets	Ratio of book value/ current value
Transnet	R114 billion	R158 billion	0.72
Transnet Freight Rail (TFR)[1] (estimate)	R40 billion	R80 billion	0.50
PRASA	R16 billion	R150 billion	0.11

Sources: SARCC (2005); PRASA (2011); Transnet Limited (2010 b); Thomas & Transnet Limited (2010); author's calculations and estimates

The above table gives a simple view of the strength of the SOEs' balance sheet, showing how depreciated their assets are. Transnet as a group is in the strongest position; with a ratio of book to replacement costs of 0.72 it has some capacity to finance future investments off its balance sheet. Freight rail, however, is in a weaker position as its assets cover only half of their replacement costs. PRASA is in an acute position with deeply depreciated assets. This leads to the conclusion that PRASA cannot fund future investment from its balance sheet and will therefore have to rely on fiscal transfers or find alternative off-balance sheet funding arrangements. Passenger rail investment is further hindered by the limited revenue raised from passenger fares due to the affordability limits of low income commuters. Noting that SOE expansion plans need to be factored in, not simply investment to maintain business operations, the actual balance sheets of the entities should be further interrogated to assess their capacities to fund investments from their balance sheets.

Operational challenges confronting freight and passenger rail are discussed separately because they are managed by different state-owned enterprises and face distinct operational issues.

1 Though TFR accounts for 58% of total Transnet revenue it only accounts for 46% of EBITDA (earnings before interest, tax, depreciation and amortisation). TFR's higher contribution to overall earnings probably arises because the more highly capitalised ports businesses have to make proportionally larger contributions to servicing capital costs. Hence it is possible to deduce not only that TFR will account for a smaller share of asset value than it does of revenue, but also that its asset structure is more dated and hence the accounting value will be a smaller proportion of current value than is the case for the business as a whole.

Freight rail

The operating mandate of Transnet is to grow rail transport's share of freight on South Africa's primary freight transport corridors. To achieve this, Transnet is seeking to progressively increase the carrying capacity of the network and improve the service quality offered to users; however it faces a number of operational challenges in attempting to do so. The constraints comprise both institutional and technical issues. These are summarised in Table 3.

Table 3: Main operational issues facing freight rail in South Africa

Operational issue	Implications/actions required to resolve
Need for alignment of purpose among government stakeholders, operational management, and the workforce	Greater policy clarity from the policy department (DOT) and stakeholder department (DPE) via the 'Rail Reform' process (See section on Institutions and Regulation in this report). Work is progressing on improved alignment of incentives between management and workforce to achieve mandated objectives
Need to manage existing infrastructure in a way that aligns maintenance intensity with track usage	Research has been undertaken and findings are being pursued regarding the development of commercially (as opposed to technically) driven standards, leading to potential maintenance cost savings of up to 35%
Not enough capacity for growing demand for container services on Durban and other routes	Improve service quality; improve utilisation rates of existing traction and rolling stock; accelerate procurement of new traction and rolling stock
Difficulty in increasing access capacity to Port of Durban for container 'block trains'	The constraint is crossing passenger lines on the way into port. Options to resolve this constraint include: grade separation of freight and passenger lines on Durban port approaches; development of a new 'dig out' port with new, dedicated freight rail access; continue to grow Ngqura
Need to increase operational efficiency/reduce dwell time at container depots including Kings Rest in the Port of Durban and City Deep/Kaserne in Johannesburg	Immediate need for additional cranes and operational improvements to move containers. Medium-term need is for a less constrained location. Highly incentivised private sector partner may be required to operate facility efficiently
Inability to expand capacity on Sishen–Saldanha iron ore/manganese line fast enough to cope with rapidly increasing global demand	Immediate requirement is acceleration of construction procurement for rail infrastructure works. Eventual need for further investment in handling capacity of the port. Longer-term need to test where economic benefits are greatest and adjust investment priorities accordingly?
Inability to consistently operate the Richards Bay Coal Line to its capacity	Ongoing operational troubleshooting and negotiations with the many users competing for access/capacity
Need to create major increase in coal export capacity to accommodate Waterberg resources	Study under way to assess options for increase in capacity to deliver coal from Waterberg to Mpumalanga power stations as well as options for a longer-term step increase in bulk exports

Sources: Transnet Limited (2010a); Interview with Transnet Limited (2011)

Institutional constraints relate to Transnet's ability to utilise its assets more efficiently and deliver better operational outcomes. Technical constraints refer mainly to the need to increase physical capacity and to manage the existing infrastructure more efficiently. Technical challenges are compounded by the complexities surrounding procurement processes associated with future rail investment plans, alongside the difficulties involved in choosing among different options to resolve the same basic problem.

The most pressing technical constraint is that of increasing the capacity to manage rail-linked container import/export facilities. This affects ports as well as rail operations (and is addressed in more detail in Chapter 3 on Ports). The decision about whether to expand the Port of Durban in its existing location, or to pursue a combination that includes adding a completely new 'dig out' port on the site of the old Durban International Airport, clearly affects the equally pressing decision about how to increase container rail capacity between Gauteng and Durban.

Transnet recently commissioned a study to ascertain how a freight railway in South Africa could be structured in order to optimise its operational efficiency. The Centre for Supply Chain Management (2010) report concluded that to be operationally efficient, the freight railway needs to operate at much higher route/corridor densities than is currently possible. In particular, it confirms a previous analysis that the branch line network cannot sustain efficient rail services. It also argues that a smaller network is required; one that is reconfigured to connect more of the current major freight generating origins and destinations to rail hubs.

On the basis of asset value, Transnet Freight Rail (TFR) is able to fund a portion of its future investments from its balance sheet. It is also clear that the Transnet business as a whole has a higher ratio of book value to current value than the freight rail business. In other words, the ports and pipelines businesses contain the main collateral value against which Transnet is able to raise its investment funds. Such a step would mean that the ports and

pipeline businesses would cross subsidise the freight rail business. A distortion would be created in the market signals in all three markets, which in turn would undermine economic efficiency. An alternative which could be considered is to raise freight charges to become cost reflective. Failing this, (massive) subsidies would be required from the state to operate unprofitable freight transport lines (which would benefit users of these services); or alternatively investment could be channelled into more cost effective alternatives where they exist (e.g. in some cases, roads).

All these options have major implications for the quantum of investment that it is economically rational to channel into TFR's rail business: revenues alone are not a sufficient basis for investment. Critically, for asset value to be a useful tool in business planning, it must be linked with maintenance, operations and demand planning.

Passenger rail

The basic operating mandate of PRASA is to expand passenger carrying capacity and service quality into, and within, major urban centres. PRASA seeks to achieve this primarily via its commuter and inter-city rail services and, in future, to supplement these with its bus operating subsidiary, Autopax, where this may be a more economic option.

The socio-economic rationale underlying PRASA's operational mandate is the government's commitment to enable lower income people to have reasonably priced access to the urban economies which provide the majority of existing and new employment opportunities. The current guidelines for achieving these operational objectives emanate from the 2005/06 Rail Plan developed by PRASA/SARCC in 2005. This document established the principle of Priority Rail Corridors to channel investment into routes where rail transport is still able to perform strongly relative to other transport modes.

However, PRASA also faces policy pressures to provide commuter services in metropolitan areas such as Bloemfontein, Nelspruit and Polokwane, and from the KwaNdebele region north of Pretoria on the Moloto Corridor. Balancing these new demands with those in existing metropolitan areas which already have commuter rail networks is a major challenge.

Rail is extremely expensive to build and operate and its economics make it suitable for high numbers on dense corridors. Nevertheless, it needs to be borne in mind that if the demand for commuter services has been identified in certain areas, an assessment of whether a rail service is the optimal means for meeting this demand and whether the benefits outweigh the costs, needs to be conducted and weighed against other passenger transport options, for example, bus systems.

Inter-city rail services (Shosholoza Meyl) were transferred to PRASA ownership and operational control in 2009, but they operate largely on Transnet tracks and rely on Transnet for haulage and rolling stock maintenance facilities. This has resulted in operational challenges and is the main contributing factor to operational disruptions of inter-city and commuter services as can be seen in the summary provided in Table 4.

Table 4: Passenger train delays and cancellations in South Africa – 2009/10

Metrorail (commuter services)		Shosholoza Meyl (inter-city services)	
Contributing cause	**Percentage contribution**	**Contributing cause**	**Percentage contribution**
Rolling stock failures	40	Transnet Freight Rail network prioritisation	53
Signalling failures	25	PRASA operations	24
Train operations and security operations	22	Metrorail network prioritisation	13
Power supply	8	Rolling stock failures	9

Source: PRASA (2011)

In addition to experiencing delays, the prioritisation of freight services on the national network means that passenger trains are generally constrained to the typical freight average speed of 70 km/h. This results in much longer travel times than buses and has contributed to the loss of market share to other long-distance passenger transport modes.

Since being transferred to PRASA in 2009, the subsidy required to maintain inter-city rail has reached over R1 billion annually. PRASA is of the view that if it is going to recover rail market share, the top priority will be to increase the speed of inter-city rail travel to more than the current freight service average of 70 km/h. While the track infrastructure does have the capacity to accommodate more trains, especially in the case of the general freight network, the shortage of rolling stock is a major constraint to greater utilisation of available infrastructure.

Different approaches are needed to address these various operational constraints. For Shosholoza Meyl, although there is a need for new rolling stock if PRASA is to meet its mandate and grow inter-city rail, there will be no point in making investments unless the operational access issue can be resolved. This will almost certainly require economic regulation which will include a framework for managing access to the network for the various operators.

For Metrorail on the other hand, the resolution of operational constraints calls for heavy investment. PRASA's proposed priority areas for addressing these constraints are listed in Table 5.

Table 5: PRASA's priority interventions to address operational constraints

Operational element	Comment	Proposed intervention
Rolling stock	Most commuter rolling stock beyond economic life – average age 35 years. Serious overloading with consequent accelerated deterioration	Major programme in place for renovation of existing stock; procurement process has been initiated for long-term fleet renewal
Signalling/communications	Deterioration in condition and technical obsolescence is a major constraint on capacity and train operational performance	A 10-year signal replacement programme was commenced in December 2010
Power supply	Power supply failures are becoming an increasing reason for service disruption	Sub stations need replacement. Power lines and masts are old and on prioritisation replacement programme
Track layout	Most urban tracks were not initially designed for passenger services and so have many turnouts and tight curves geared towards accessing older rail-linked industrial sites	Rationalisation needed to optimise increased passenger service capacity
Track condition	Generally very good	Higher network capacity/modern trains will need doubling of some tracks and improved network/ staging areas (for storage and quicker deployment of trains into service at the right points/junctions)
Permanent way (civil engineering structures)	Condition generally good but affected in places by very heavy rains	Ongoing maintenance issue only

Source: PRASA (2011)

Notwithstanding the need for the capital interventions alluded to earlier, PRASA also has a programme to achieve operational improvements within the constraints of its existing system capacity. The aim is to change the nature of current operations by, among other things:

- An improved preventative maintenance programme;
- Focusing on the following 'key operational efficiency measures' (KOEM):
    - Monitoring of capacity utilisation versus passenger demand
    - Introduction of rotational shift system
    - Reduction of operational costs by 10% over the next three years;
- Focusing resources on high volume corridors – taking the Rail Plan's Priority Corridors a step further.

Utilisation of available infrastructure: demand patterns

Within the current configuration of available infrastructure, both Transnet and PRASA argue that demand exceeds currently available carrying capacity. While the track infrastructure does have the capacity to accommodate more trains, especially in the case of the general freight network, the shortage of rolling stock is the main constraint to greater utilisation of available infrastructure.

Freight infrastructure and demand/usage patterns

Transnet's rail operations include Transnet Freight Rail (TFR) and Transnet Rail Engineering (TRE). TFR runs rail freight services and TRE maintains the infrastructure and rolling stock. TFR has three main operating businesses: General Freight Business (GFB), the export coal line to Richards Bay, and the export ore line to Saldanha. Between them, the three operating businesses moved about 180 million tons of freight in 2010. Table 6 illustrates the share of volume by business, the notionally available capacity, and revenue earned.

To place TFR's role in perspective, Transnet's total revenue in 2010 was R35.6 billion, of which TFR's R21 billion accounted for 58%. Ports (terminal operations and port authority earnings) accounted for 33% and TRE and Transnet Pipelines, 4% and 3% respectively.

Within freight operations as a whole, the general freight business accounts for a disproportionate share of revenue compared to volume carried. This reflects in particular the fact that containers earn very high revenue per ton, compared to the very low margin bulk coal and ore businesses. The Durban–Gauteng corridor is

the most intensively used GFB corridor and also the highest revenue earning corridor in the country because it is the busiest container carrying route. From a revenue point of view it is critical for Transnet that this corridor is able to expand its capacity. As will be seen in the section on investment plans, this corridor is a major focus for new investment.

Notably, the global recession impacted far more on the GFB than on the bulk export sectors and hence on Transnet's revenues. Although 2010 levels are still lower than the previous year, the second half of the year demonstrated an upward trend warranting the expected GFB growth, as demonstrated in Figure 6.

Table 6: Transnet freight rail volumes carried and revenues earned – 2010

Business	Total volume/estimated current capacity	% of total volume	Total revenue/(approx. figures per business)	Approx. % of total revenue
General freight	72.1mt/100mt	40.4	R12.5bn	60
Export coal line	61.8mt/70mt	34.6	R3.2bn	15
Export ore line	44.7mt/50mt	25.0	R5.3bn	25
Total	**178.6mt**	**-**	**R21bn**	**-**

Sources: Transnet Limited (2010a); Transnet Limited (2010b); author's estimates and calculations

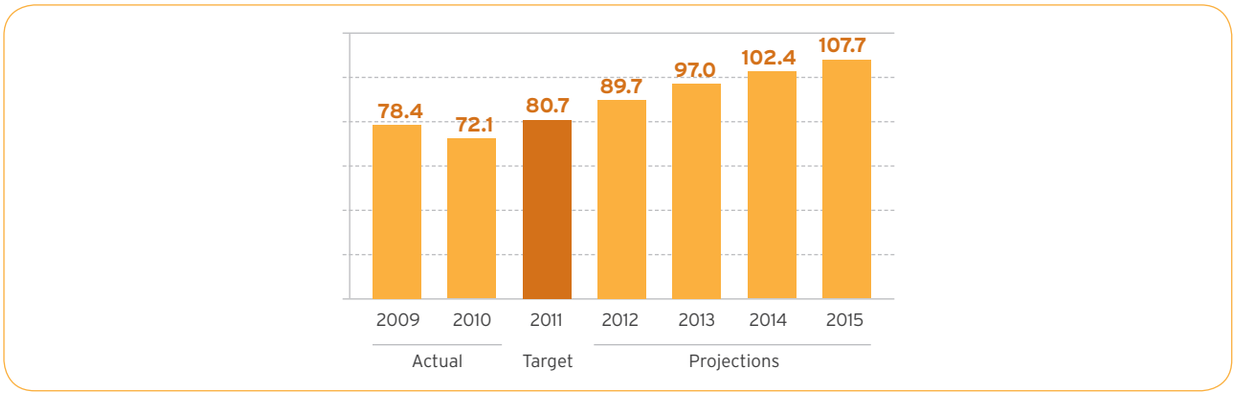


Figure 6: General freight 2009/10 volumes and growth projections (million tons)
Source: Transnet Limited (2010b)

In contrast to container business, global commodity market growth trends were only briefly interrupted by the 2008/09 recession, hence both the export coal and export ore businesses face intense demand for expansion of capacity and this too is reflected in growth projections. Coal exports in 2010 remained close to 2009 levels, but ore exports increased dramatically, mainly as a result of train operational efficiency improvements. The 2010 performance demonstrates the huge scope for increasing rail throughput through better utilisation of existing operating capacity.

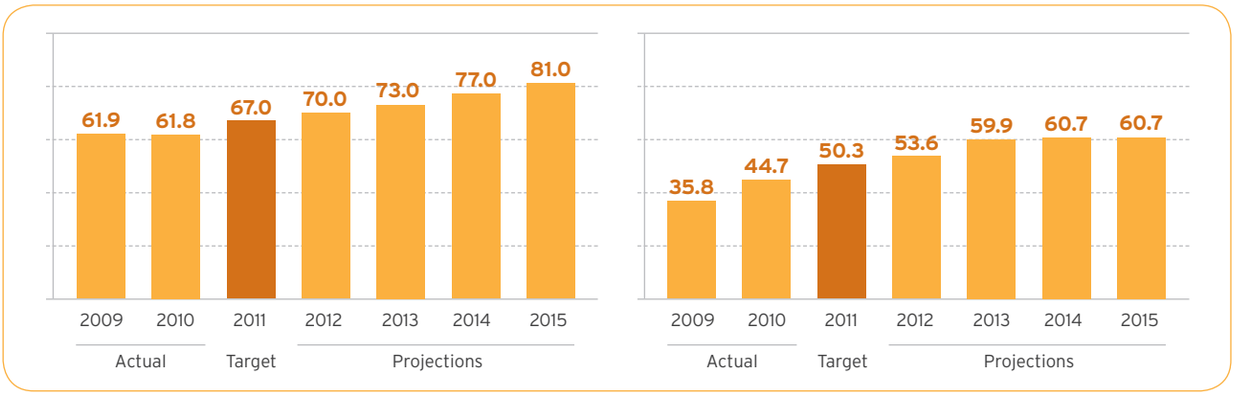


Figure 7: Export coal and ore 2009/2010 and growth projections (million tons). Export coal – Richards Bay line; Export ore – Saldanha line
Source: Transnet Limited (2010b)

Passenger infrastructure and demand/usage patterns

PRASA has two passenger rail operating businesses: commuter rail services are operated by Metrorail and inter-city services by Shosholoza Meyl. A higher quality tourist product, Premier Classe, is offered as part of the Shosholoza Meyl business.

In terms of **Metrorail**, Figure 8 illustrates trends in commuter rail demand for the past 30 years. From a peak of over 700 million commuter trips per year in the early 1980s, numbers declined steeply to a low of 400 million in the early 1990s. As discussed further in Chapter 4 this is accounted for substantially by the deregulation of passenger transport and the introduction of the minibus-taxi industry. After recovering to around 500 million trips per year, numbers remained static until the early 2000s. The further rise from 2003 is accounted for mainly by the fact that, while prices for buses and especially minibus-taxis will have risen in line with fuel prices, rail prices were pegged at September 2003 levels until the beginning of 2010.

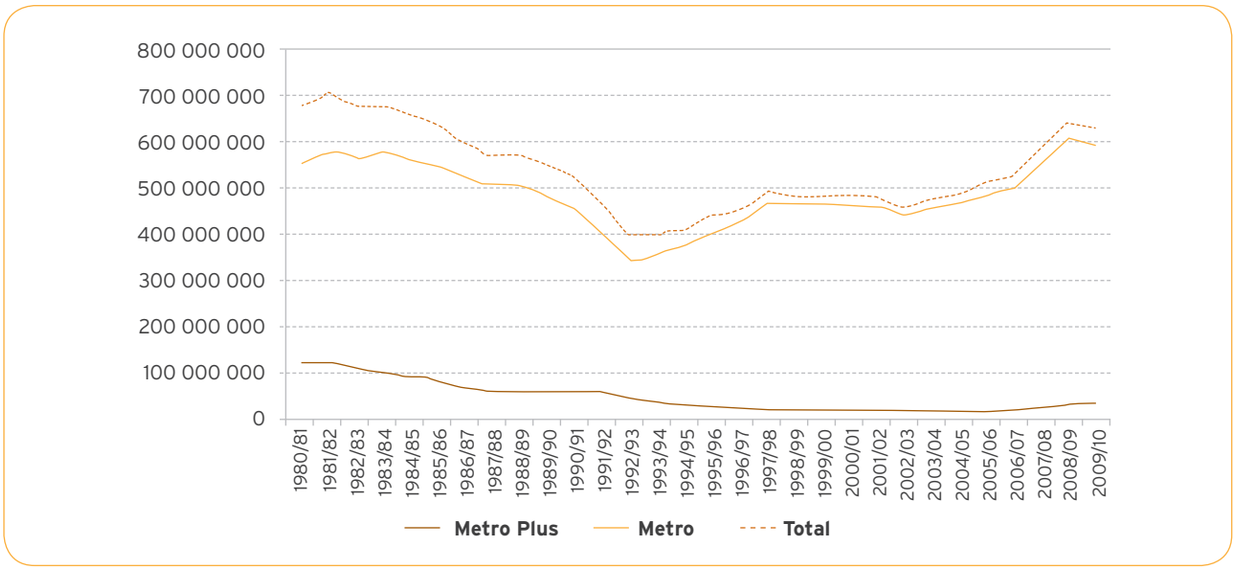


Figure 8: Commuter rail usage trends – 1980/81–2009/10

Source: PRASA (2011)

The reason for the 2003 price freeze was that some 20% of the oldest rolling stock had to be removed from service, thus reducing service frequencies. The growth since 2003 has thus placed increasing pressure on the network largely because plans to refurbish and then procure additional new rolling stock have not kept pace with this substantial increase in demand. As already noted in Table 4, capacity is also limited by signalling unreliability and failures and, more recently, by power outages caused by ageing infrastructure.

As a consequence, most parts of the commuter rail network face an excess of demand over supply to such an extent that PRASA believes that even if current infrastructure were fully restored, demand could not be met. The reason for this is that the original rail infrastructure network was not designed for the levels of line throughput currently being achieved, let alone the much higher passenger numbers that modern commuter rail systems in other countries achieve. On PRASA's busiest corridors such as Khayelitsha–Cape Town; Soweto–Johannesburg and Mabopane–Pretoria, maximum hourly throughputs are in the region of 25 000 passengers per hour, whereas certain modern mass transit rail systems can carry 60 000 passengers per hour.

This realisation has prompted PRASA to consider the option of introducing 'step changes' in commuter transit technology on selected 'demonstration corridors'. A new Passenger Rail Strategic Plan to replace the 2006 Rail Plan is currently in preparation and will consider various options for matching capacity planning to appropriate transit technologies. The data in Table 7 presents a snapshot of current commuter rail utilisation.

Table 7: Commuter rail (Metrorail) utilisation data – 2010

Passenger jouneys	600–650 m per annum
- Western Cape	50% of market share
- Durban	13% of market share
- Wits	38% of market share
- Pretoria/Tshwane	15% of market share
Daily passenger journeys	2.4 million
Average travelling distance	26 km
Train km	24 000 000 per annum
Passenger km	15 524 822 327 per annum
Trains scheduled	57 000 per annum
Market share	15% (10% main mode)
Employees	10 000 (PRASA 13 000)

Source: PRASA (2011)

A key feature is market share: in particular the market share of public transport modes, in which the minibus-taxi mode has 70%, commuter buses 15% and rail 15%. Cape Town is an exception to the national picture in that rail is actually the dominant commuter mode with nearly 50% of the public transport market share. This reflects the fact that the geography of the Cape Town network encompasses a much broader spectrum of population groups than in other cities. Nationally, 2.4 million commuter trips are made on the Metrorail commuter networks every day, with the largest number being in the Wits, or southern Gauteng, network region. Much smaller, single line commuter rail systems serve Port Elizabeth and East London.

The average commuter travelling distance of 26 km reflects the heritage of racially segregated residential areas typically being located inconveniently far from workplaces. As a result of such distances, the relatively low average speeds, and also the need for many passengers to connect to another mode for a second leg of their journey, commuting times by rail are generally longer than for journeys involving only bus or minibus-taxi. This highlights the need identified by PRASA for a step improvement in service levels on key corridors, if rail transport is to retain a significant place within the commuter travel market in South Africa.

As regards the **Shosholoza Meyl inter-city rail business**, the key issue is that inter-city rail travel has declined from a peak when it was the dominant inter-city travel mode in the mid-1950s, to a very small proportion of all inter-city travel. Shosholoza Meyl carries approximately 3.5 million passengers per year (compared to the 600 million passenger trips per year on the commuter rail network).

Although recent statistics for inter-city travel by various modes of transport are not available, it is possible to estimate the proportion of the inter-city market carried by Shosholoza Meyl by comparison of data for all travel and commuter travel: rail accounts for 15% of all *public transport* commuting, and public transport commuting accounts for approximately 50% of all commuting; therefore rail makes up about 7.5% of *all* commuting in the country. Given that Metrorail has 600 million passenger journeys per year and Shosholoza Meyl 3.5 million, the majority of rail's 4% (2004)/3% (2010) share of all travel will be accounted for by commuter journeys. It is therefore probable that rail transport is currently responsible for considerably less than 1% of all inter-city journeys in South Africa.

The majority of inter-city rail travel is on overnight 'sit-up' services for which prices are lower than buses, and larger amounts of luggage can be carried. These services are attractive between Gauteng and the Eastern Cape, Mussina for Zimbabwe, and Nelspruit for Maputo. Demand peaks during Christmas and Easter holidays.

Since being transferred to PRASA in 2009, the subsidy required to maintain inter-city rail exceeds R1 billion annually. PRASA is of the view that if it is going to be possible to recover rail market share, the minimum initial requirement will be to increase the speed of inter-city rail travel to more than the current freight service average of 70 km/h.

New rail investment projects

Transnet acknowledges that the performance of its assets lags behind global benchmarks for similar businesses. In 2010, the concept of a 'Quantum Leap Strategy' was introduced to emphasise that the new R93 billion five-year investment plan would be measured by its impact in terms of improved asset utilisation.

The main objective of the capital and operational investment programme is to improve the efficiency of rail and port services. For TFR, this involves reducing wagon turnaround times by 20%, improving punctuality by 25%, and locomotive efficiency by 30%, with the objective of growing volumes/revenues by 10% each year against an expected GDP growth of 3% per year.

At the time of writing, about 60% of Transnet's R93 billion investment plan, some R56 billion, is earmarked for the rail sector. Of this about 35% will be spent on expanding rail capacity and 65% on upgrading and maintaining existing rail capacity. From the point of view of assessing value for money, it is important to understand that the planned investments will only lead to enhanced revenue performance if the forecasts of freight demand are actually realised. If not, the investment will lead to increased capacity and deterioration of asset performance. This is the predicament that the 'Quantum Leap Strategy' seeks to address.

Investment planning in Transnet is guided by a comprehensive transport infrastructure plan (TIP) based on a 30-year time horizon, and broken down into five-year investment programmes. The TIP relies on a sophisticated freight demand forecasting model which estimates freight growth in magisterial districts around the country, in terms of the proportion of freight expected to use rail as opposed to road. Forecasts of freight rail capacity requirements, derived from this model, are the basis of the infrastructure plan and hence the investment programme.

Table 8 outlines the main rail freight programmes on which the R56 billion will be spent over the next five years.

Table 8: Transnet rail business – investment priorities for R56 billion, 2011–2015

Rail freight business sector	Investment focus	Comments
Export coal	• Expansion of the Richards Bay coal export line from current 61mt capacity to 81mt by 2015 • Upgrade of existing rolling stock • Rail yard expansions/electrical power upgrades • Purchase 110 new locomotives	Operational challenge of optimising bulk volumes in context of working with multiple coal suppliers
Major feasibility studies	• Expansion of Richards Bay line beyond 81mt • Capacity to Mpumalanga power stations • Capacity to export from Waterberg coalfields	Additional exports could involve links through other countries
Iron ore and manganese exports	• Expansion of ore exporting capacity to 80mt • Relocate manganese export facility from Port Elizabeth to Ngqura or Saldanha • Expand rail carrying capacity accordingly	Market desire is to grow manganese exports from current 5.5mt to 14mt
General freight business	• Investments in wagons and locomotives for growth in rail transport of containers • Investment in wagons, and new rail line for domestic coal transport routes	Aim is to increase total GFB volumes from current 72mt to 110mt, focusing on bringing containers from road to rail and expanding domestic coal deliveries

Sources: Transnet, (2010a); Transnet Limited, (2010b); Transnet Limited, (2011)

Unlike Transnet, PRASA is reliant directly on central government for its capital investment funds. Its revenues cover only 30% of operating costs and so cannot contribute to capital spend. PRASA has to motivate spending via its annual corporate plans as well as periodic strategic planning documents. The current strategic planning framework, within which capital expenditure is to be motivated, is the Cabinet-approved 2006 National Passenger Rail Plan (Department of Transport 2005a). This document sets out the Priority Rail Corridors Framework for commuter rail in South Africa.

The main thrust of the Rail Plan is to establish a rationale for the 'role of rail' in commuter transport generally. It argues that the primary role of commuter rail is to provide an economically efficient mode of commuting for lower income South Africans, and articulates the investment priorities required to enable rail to play this role. The main investment item, at a total capital cost of around R200 billion over a period of thirty years, is the refurbishment of rolling stock, with signalling improvement second, and power supply third.

In addition to articulating plans to meet these requirements, PRASA has faced further investment challenges from rural areas that want to be connected by rail to key employment centres. These include the Moloto Corridor line (KwaNdebele to Pretoria) and the Botshabelo line (central Free State to Bloemfontein). Besides growing investment pressures, PRASA has also been challenged by government to be more proactive in developing its asset base as a means of leveraging supporting funding from the private sector. Its property assets, in particular, could be seen as a potential source of funding. Recent restructuring has seen the property arm of the business, Intersite, being divided into:

- PRASA Corporate Real Estate Services, which will focus on the commercial management of operational properties, including stations; and
- Intersite itself which will focus on property developments on rail lands, commercial services and financial planning.

PRASA's aim is to raise additional money and reduce the funding burden on the Treasury. PRASA aims to become more focused on the commercial potential of its assets and thereby progressively reduce the level of subsidy required from 70% to 50%.

Finally, the Rail Safety Regulator (RSR) is already established in South Africa. Its safety mandate has substantial cost implications for rail operations. Failing rolling stock and in particular failing signalling and communications infrastructure places the operating environment at high risk. The RSR's mandate can enable it to insist on remedial work, and the costs involved may be greater than the rail operators' budgets allow. Ultimately, minimum standards of safety need to be met, and affordability remains imperative. The cost implications of safety regulation are an important factor in future rail investment plans.

Table 9: PRASA long-term capital investment programme

Investment area	Project/concept	Comment
Medium/long-term programme of R80 billion (30 years)	Procurement programme for complete recapitalisation of fleet	Important role for industry
Ongoing programme of rolling stock upgrades; R3 billion – R4 billion per year	Extends operating life of stock and better passenger accommodation	Performance of upgraded stock little better than current; may be rolled into recapitalisation programme
30-year programme of R30 billion to replace signalling systems	Tender stage	
Infrastructure upgrades – including power supply and stations R20 billion		
Focused, infrastructure upgrades and network expansions	Joint investments with developers to offer rail transport to new customers. Track/stations expansions where scope exists to capture market	e.g. Bridge City shopping precinct north of Durban e.g. Green View/Pienaarspoort, Tshwane network region

Source: PRASA (2011)

Legislation, policy and institutions

The South African Transport Services Act of 1981 (Government of RSA 1981) reconstituted the old SAR&H into the commercial, but state owned, South African Transport Services Company, responsible for railways, ports and South African Airways. The Legal Succession to the South African Transport Services Act of 1989 (Government of RSA 1989) provided for the creation of Transnet, which is still responsible for all rail operations, the ports, and South African Airways. The need for a separate planning body to focus on commuter rail was recognised, and so the South African Rail Commuter Corporation (SARCC) was established.

The Legal Succession Act gave Transnet a mandate to operate rail, ports and the national airline commercially, and as far as possible without recourse to state funding. SARCC was given a mandate to procure socially necessary passenger rail services, mainly for commuter services into and within the main metropolitan areas. It was understood that this would entail a government subsidy and that SARCC's role was to plan commuter services in conjunction with the operator Metrorail, which was still part of Transnet. SARCC would channel an annually agreed operational subsidy, as well as agreed capital funding, to Metrorail. At the same time, the physical assets, mainly the tracks and stations relevant to offering commuter services, were allocated to SARCC. Inter-company agreements were entered into to pay for access to each other's tracks.

Since then, Metrorail (2006) and Shosholoza Meyl (2009) have been transferred from Transnet to what has now become PRASA. This process required some amendments to the Legal Succession Act because of the need to allow PRASA to procure a range of support services for the inter-city rail business.

As regards rail policy, the Department of Transport (DOT) notes in a recent discussion document, that "[W]hile there are many transport-related policy documents, which are currently relevant to rail policy . . . there is no separate National Rail Transport Policy" (Department of Transport, 2011:12). The main 'transport-related' document is the DOT's 1996 White Paper on National Transport Policy (Department of Transport, 1996). However, this is a 'visioning' policy, setting out the socio-economic purposes of transport generally. It does not engage with the institutional structures though which rail transport in particular is delivered.

As a result, rail transport hardly features in the otherwise quite thorough, local government-based arrangements for transport planning in the country, including Integrated Development Plans (IDPs), Spatial Development Plans (SDPs), Integrated Transport Plans (ITPs) and Public Transport Registers. The absence of a comprehensive rail policy, part of the institutional heritage of the rail sector, has given the state-owned enterprises in the sector a very high degree of independent control, albeit within state ownership.

In order to plan effectively for the future of the rail sector, it is necessary to establish consensus about what is expected of the rail sector, as well as of the industry and institutional structures that will make it possible to achieve these goals. In the case of freight, the 2007 National Freight Logistics Strategy (NFLS) (Department of Transport, 2007) is the policy framework, while PRASA relies on the 2006 National Passenger Rail Plan (Department of Transport, 2005a).

The NFLS sets the following main priorities for freight rail:

- A better balance between road and rail modes should be sought involving a transfer of goods back to rail from road.
- Institutional changes are required to make rail more efficient, including separating infrastructure management from operations, and introducing a rail economic regulator.
- Rail's role in international trade in the southern African region should be promoted.

The Rail Plan highlights the following main priorities for passenger rail:

- Commuter rail services should be concentrated on priority rail corridors on which rail transport is likely to grow its market share compared to bus and minibus-taxi modes;
- A major programme of rolling stock upgrades and then recapitalisation should be planned in order to improve service quality, and then to grow the sector;
- Rail should investigate opportunities for serving additional commuter corridors linking more rural/semi-rural areas to centres of employment.

Rail reform process

Since 2007, the DOT has been seeking to implement the NFLS recommendation to introduce a rail economic regulatory function. These efforts have highlighted the fact that regulation in the context of separate passenger and freight rail operating mandates is problematic and that a comprehensive review of all stakeholders is needed to contemplate how the rail sector must be restructured in a way that allows freight and passenger objectives to be realised harmoniously. Consequently, a rail reform process is currently under way.

Initially, the driving factor of the reform process was the concern that both freight and passenger rail operations in South Africa are struggling to become efficient. It has since become increasingly apparent that South Africa is belatedly experiencing what has already been faced in many other countries: the institutional structures required to operate rail transport were more appropriate to a time when rail was the dominant land transport mode.

Critically, rail restructuring and future investments should be conducted, not only to meet the objectives of the railway businesses, but also to benefit overall national welfare. This is a vital distinction because it places national welfare above the operational objectives of transport operators.

The DOT Discussion Document (2011) reviews two main institutional restructuring models:

- *Vertically integrated* models in which rail operators remain responsible for managing the infrastructure which they use; and
- *Vertically separated* models in which a separate company is established to run the infrastructure and then operators enter into contractual arrangements and pay for access.

The latter model requires a regulator to oversee the arrangements for access agreements, in order to ensure fair competition and pricing of services. A robust economic framework would make the function of economic regulation both easier to implement and more acceptable to stakeholders, and would enhance the performance of the rail sector. Although no final recommendations are made in this preliminary document, there is a suggestion that the economic advantages of a competitively accessed, vertically separated structure may be difficult to achieve in the context of a relatively small rail market like South Africa.

The restructuring of South Africa's rail network must take cognisance of the reasons that have led to rail's major loss of market share over recent decades the world over. These include the link revealed in long-term historic analysis between different transport technologies and their capacity to transmit economic growth, and the fact that inappropriate institutional structures are more likely a symptom rather than a cause of rail's economic decline.

The problem is not unique to South Africa. In most countries where rail reform has been undertaken, the main reason has been rail's declining economic benefit-to-cost equation, often resulting in costs escalating to unsustainable levels. Although a recovery in rail market share is taking place in some countries, it is not yet possible to judge whether the high costs at which this is being achieved represents good value for money.

The need to subsidise rail is not in question: doing so for social reasons in the passenger environment is a long established principle in South Africa and other countries. Clarity of policy is necessary, with the subsidies being explicitly linked to securing agreed social objectives. However, if subsidies are required for freight rail as well in the future, it is important that there should be clarity about what the subsidies would be purchasing and why they are required.

Finance for the development of the sector

For the rail reform process, it is important to recognise that improvements in operational and asset utilisation efficiency should be the foundation of any case for ongoing funding, whether a business is approaching commercial markets or the National Treasury. One of the functions of a future rail economic regulator should be to ensure that operators are able to justify spending plans and show that all possible efforts have been made to obtain better productivity from existing assets. However, if this were to happen, the Regulator would need to show that it is better positioned and able to assess the investment case than the shareholder.

The financing requirements for both Transnet's and PRASA's capital investment plans need to be considered within the current uncertain institutional and policy context. As alluded to earlier, Transnet is of the view that it is able to finance new investments from its own balance sheet, while PRASA requires a fiscal transfer not only for new investment, but also to cover operational costs. Transnet's 'Quantum Leap Strategy' and PRASA's new focus on leveraging value from its property assets represent a healthy realisation that finance is not freely available, nor is new capital investment always the most economically appropriate response to operational concerns.

Until the rail reform debate is concluded, and in the absence of a settled institutional/policy framework, it is not possible to make meaningful comments about the actual availability of finance for the sector. It is, however, important to note that Transnet and PRASA have made it clear that they may not be able to fund all their infrastructure projects and may need to consider private sector participation options to supplement public funding for major

projects such as the total recapitalisation of commuter rolling stock. Both Transnet and PRASA will need to test the basis on which public-public or private sector participation might be forthcoming.

Key challenges in the rail sector

The central challenge to rail reform in South Africa is to be realistic in terms of both the financial and economic costs of policy aspirations. Furthermore, required policy, institutional and regulatory changes must be made to enable the rail sector to respond appropriately by prioritising investments in areas where rail has a comparative advantage and avoiding investments where no such advantage exists.

The policy discussion about rail reform in South Africa is anchored in the 'road versus rail' debate. Conclusions on the relative economic impacts of rail and road infrastructure investment may be explained by the fact that rail transport technology lends itself mainly to the particular requirements of a relatively small number of industries or commodities.

While the actual users of the railway may benefit from rail transport's generally lower transport costs, the system does not lend itself to the establishment of new smaller and medium-sized enterprises. The reason is that rail technology suits transporting large scale, bulky goods over long distances, which are not the typical transport requirements for small and medium enterprises. In contrast, the flexibility and accessibility offered by road infrastructure typically facilitates the development of a much wider range of commercial enterprises, and also allows many more locations to engage in economic activity, than would ever be possible with rail. This is the case despite the fact that road transport costs are generally higher than rail transport costs.

In terms of road transport, users typically operate and pay for their own vehicles, with access to the infrastructure often being free at the point of use. Unless tolling is involved, the operators have nothing to do with the infrastructure provider, nor do they have to make any contribution to the cost of the infrastructure that they utilise, save for revenues raised from fuel tax, only part of which goes towards roads. For rail, in contrast, it is the intrinsic 'infrastructure and operations' character that complicates attempts to improve service offerings. Historically, infrastructure and operations have been offered by the same organisation and, because competition from road transport was not strong, rail companies were better able than now to manage tensions arising from conflicting freight and passenger service demands.

The main determinant of the economic impact of transport infrastructure investment lies not in the *quantity* of investment deployed, but in the *quality* of spend. Furthermore, the quality of spend depends more on the ability of the different transport technologies to transmit general economic value than it does on the actual costs to users of the transport system. The evidence suggests that rail infrastructure investment does not transmit as much economic value as investment in paved roads.

The implication is that any measure of infrastructure efficiency will need to take a broader view than the cost of using different transport systems. For example, heavy investment in rail infrastructure to 'lower the cost of logistics', may benefit only a relatively small number of users of an operationally efficient rail service. A complete analysis of the situation, however, should ask whether the benefits to a minority of producers of 'rail-friendly' cargoes might be outweighed by a reduction in the numbers of small and medium-sized businesses which would otherwise have resulted from greater investment in road infrastructure.

Within this context, the immediate priorities for rail include:

- Funding rolling stock recapitalisation (commuter rail);
- Finding a satisfactory basis for motivating investment in the existing inter-city rail service, and only thereafter any new passenger rail service (deciding on the mode should depend on comparison of assessments of various modes, with the choice being based on the most optimal for purpose);
- Demonstrating a link between freight rail investments and overall economic benefit (it is not a 'given' that almost any rail spending is beneficial);
- Using economic sustainability measures as a basis for going to the market to seek funding for Transnet's infrastructure projects;
- Showing that the overarching challenge to the rail sector is to become more customer-focused in its investment prioritisation;
- Achieving consensus on what is expected from the rail sector; and
- Establishing a regulator to ensure implementation of – and compliance with – agreed policy.

3 Ports infrastructure

Photo: Hannelie Coetzee, MediaClubSouthAfrica.com

The agreed objectives of the infrastructure programmes in the ports sector is to provide capacity ahead of demand and to achieve globally benchmarked performance

South Africa has eight main commercial ports: Saldanha Bay, Cape Town, Mossel Bay, Port Elizabeth, Ngqura, East London, Durban and Richards Bay. All these ports are owned by the National Ports Authority (NPA), a division of Transnet. As the national ports planning authority, Transnet divides the ports into three groups: the Western, Central and Eastern ports, as illustrated in Figure 9. This division is based broadly on the hinterlands they serve. The ports are linked by corridors to the industrial and mining centres of Gauteng and Mpumalanga.

Commercial ports are a complex blend of physical infrastructure and operational services. Moreover, they function as one part of an intricate logistics framework within a commercial and economic environment. It is often difficult to draw a clear line between port infrastructure and that of the many port-related service industries that are often co-located with the port. Hence, it is not only the scale or physical capacity of the infrastructure that determines the effectiveness of the ports; rather, it is the efficiency with which they serve their users within an environment that measures their value in serving the national economy.

Such contextual matters are important. For example, in certain ports there may be a mix of public and private ownership and/or operation of the infrastructure; or the port may depend for its effectiveness on support from adjacent storage facilities and transport links into its hinterland; or it may serve multiple customers or only a small number of large customers. These other, non-infrastructural aspects of ports' performance are vital in any consideration of the efficiency and effectiveness of ports infrastructure.

South Africa's ports cover a wide variety of functions. Some of them focus almost exclusively on bulk commodities, such as ore exporting/petroleum importing at Saldanha. Others serve one major industry only, such as the off-shore oil industry in the case of Mossel Bay. Yet others may specialise in one cargo type, but also have facilities for a wide range of commodity types. Durban was previously the largest container handling facility in the southern hemisphere (overtaken in recent years by Jakarta, Indonesia). It is also the country's largest petroleum handling port, with a wide range of dry bulk and mixed use cargo services.

Figure 9: Ports of South Africa by corridors served
Source: Transnet Limited (2010a)

Table 10 summarises trade at all South African ports for the year 2008/09[2] in order of shares of the overall total throughput of 236 million tonnes. The following are some key points:

- Richards Bay and Durban together account for over 65% of all throughput;
- Richards Bay and Saldanha together account for 80% of dry bulk trade (mainly ores);
- Durban and Saldanha together account for nearly 84% of liquid bulk (mainly fuels);
- Durban and East London together account for 98% of all vehicle imports and exports;
- Durban and Cape Town together account for over 82% of all container trade.

Table 10: Trade volume – all South African ports, 2008/09 (million tonnes/percentages)[3]

Category	Richards Bay*	Durban	Saldanha	Cape Town	Port Elizabeth	Ngqura*	East London	Mossel Bay	Totals by category
Dry bulk	74.75	7.70	33.84	0.81	2.73		0.42		120.25
% of SA total	62.20	6.40	28.10	0.70	2.30	0.00	0.30	0.00	100.00
Liquid bulk	1.70	26.48	15.71	2.81	1.01		0.87	1.78	50.38
% of SA total	3.40	52.60	31.20	5.60	2.00	0.00	1.70	3.50	100.00
Break-bulk	3.75	2.30	0.98	0.32	0.31		0.13	0.07	7.86
% of SA total	47.70	29.30	12.50	4.10	3.90	0.00	1.70	0.90	100.00
Vehicles		3.60			0.07		0.51		4.18
% of SA total	0.00	86.10	0.00	0.00	1.70	0.00	12.20	0.00	100.00
Containerised		34.56		9.38	5.40	3.40	0.77		53.51
% of SA total	0.00	64.60	0.00	17.50	10.10	6.40	1.40	0.00	100.00
Totals	**80.20**	**74.64**	**50.53**	**13.32**	**9.52**	**3.40**	**2.70**	**1.85**	**236.18**
% of SA total	**34.00**	**31.60**	**21.40**	**5.60**	**4.00**	**1.40**	**1.10**	**0.80**	**100.00**

Sources: Adapted from Ports Regulator (2010a:35); Ports & Ships (2011)

History of South Africa's commercial ports

Each port in South Africa has its own history and origins. In the case of Cape Town, its trading history goes back to the formal Dutch settlement at the Cape in 1652. But before this, ports such as Saldanha Bay, Mossel Bay, Durban and several other locations were visited by Portuguese and then Dutch traders stopping for shelter, water or even small-scale trading.

The modern commercial era of South Africa's ports commenced with the unification of the country geographically and politically at the beginning of the twentieth century, following the 1899–1902 Anglo-Boer War. Three important features of ports in South Africa are critical to understanding the current institutional situation:

- the absence of strong competition among the ports;
- the relative independence of harbours and railways from direct government control; and
- the presence of a strong link between the ports and railways.

Prior to the Anglo-Boer War and right up until the establishment of the Union of South Africa in 1910, strong competition existed among South African ports, particularly between the eastern seaboard ports of Durban and East London, and Lourenco Marques (now Maputo) in Mozambique. But the South Africa Act of 1909 (Government of UK 1909) changed this by bringing both harbours and railways into government ownership.

Although enacting state ownership, the Act of the Union gave the harbours and railways a degree of independence from direct government control that persists to the present day. This framework of independence within state ownership was consolidated with the establishment in 1916 of the South African Railways and Harbours Regulation, Control and Management Act (Government of Union of SA 1916). One of the effects of the 1916 Act was that virtually all activities within the ports, as well as actual ownership of the infrastructure and equipment, were consolidated within one new company: South African Railways and Harbours (SAR&H). The only exceptions are in Durban where entrenched involvement of private leasehold terminal operators and hauliers is acknowledged, in particular the Richards Bay Coal Terminal (RBCT) which is privately owned.

While central ownership of ports has been, and continues to be practised in many other countries, a distinctive aspect of the arrangement in South Africa was the bringing together of ports and rail transport. Later, the SAR&H was to absorb Union Airways, an emerging mail and passenger air transport business, leading to the formation of South African Airways. From very early on it also engaged in limited road haulage activities in certain areas of the country and later entered into the road transport sector in a substantial manner.

2 The year 2008/09 is the latest year for which comprehensive, consolidated data is available. The year 2009/2010 was adversely affected by the global recession, but by 2010/11 overall trade levels in many categories had begun to grow again.

3 Ngqura data is 2009/10. Richards Bay has facilities for some container handling; data not separated here.

One of the effects of having the ports, and what was for many years the main surface transport mode (i.e. rail), under unified ownership, was that port investment and rail investment could be coordinated. Furthermore, the SAR&H was able to deal with competition from road through legislative – rather than competitive – means. From about the mid-1920s, for example, SAR&H became increasingly concerned about road competition, so the government appointed a commission to investigate the problem. This led to the 1930 Motor Carrier Transportation Act (Government of Union SA 1930) with its requirement that licences for road haulage be issued by road transport boards. In practice, issuing of such licences required SAR&H approval.

Between 1910 and 1930 ports' throughput and GDP growth moved in parallel but diverged thereafter and it was only again in the 1970's that port throughput started to track GDP growth again. This is further expanded upon in the paragraph titled, 'Relationship between investment in ports and economic growth' on page 44.

In the intervening period, which is when the SAR&H was protecting the railways from road competition, growth in goods handled at the ports lagged far behind GDP growth. However, during the 1980s, protection of rail transport weakened and was eventually scrapped. This happened after the De Villiers Report (Department of Transport, 1986) highlighted the fact that rail protection was working against the national economic interest.

The increase in road transport which took place once the restrictive rail industry practices ceased, appears to have led to a period of stronger growth in ports' throughput, from the mid-1980s to the end of the period measured, despite falling GDP. This evidence supports the view that protection of the rail sector acted as a major constraint on the growth of trade and, by extension, on ports investment.

Overview of South Africa's commercial ports

In order to provide a more nuanced perspective of South Africa's eight commercial ports, a brief summary of the composition and operation of each is provided below.

Port of Durban

The Port of Durban offers the most comprehensive range of infrastructure and services of all the country's ports. Figure 10 illustrates the layout of the port and the grouping of its facilities into bulks (liquid and dry), container and car handling, and mixed use/break-bulk. The port has 59 active berths as well as a single buoy mooring point at Isipingo (outside the main port) for Very Large Crude Carriers (VLCCs) to discharge crude oil. This translates into over 15 km of quays.

The main commodity categories handled at Durban are: containers, vehicles, grains (rice, maize), forestry products (including woodchip), liquid bulks (crude oil, petroleum products and chemicals), coal, fertiliser, steel, fruit, sugar, and passengers (including cruise vessels).

Although the whole port is owned by Transnet through the NPA, a number of terminals are operated by private companies, including:

- The coal/dry bulks terminal on the Bluff side of the port. The main operator is Bulk Connections;
- The Island View bulk liquids terminal;
- Fruit, sugar and forest products terminals mainly in the Maydon Wharf area of the port. Operators include: Outspan International; SA Sugar Terminals, Rennies Bulk Terminals, Tate & Lyle, ICI, Agriport Elevator, Grindrod, Bidfreight and Brunnermond.

The container terminal, Pier 1, and Durban Container Terminal (DCT) are operated by Transnet Port Terminals (TPT). However, container operations require extensive landside support services for storage, stuffing and unstuffing, receiving and despatching, and repairs. These services, both within and outside the port, are provided by a large number of logistics services businesses.

The NPA operates a fleet of some 10 tugs as well as service boats and a pilot boat. Pilot services are provided by helicopter, all ships being met three miles off-shore and a pilot landed on board to guide the vessel to berth. The pilot boat offers the service if the helicopter is out of action. Three dredgers are constantly employed to keep the entrance clear of fresh silt deposit, and also to maintain the correct depth of channels and berths within the port.

Durban operates a bunkering (fuelling) service for ships calling at the port. The private Joint Bunker Services (JBS) company supplies approximately two million tons of ships' bunkers to vessels, with delivery almost exclusively by barge, direct to the vessels rather than by shore side pipeline. Port infrastructure also incorporates ship repair facilities opposite the southern end of Maydon Wharf. Both Transnet and private operators have repair facilities.

Table 11 provides an analysis, by type of cargo, of tonnage throughput for the Port of Durban for the financial year 2008/09. Total tonnage for this year was just under 75 million tonnes. The largest single cargo category was containers, accounting for nearly 35 million tonnes or 46% of the port's total throughput. Imports dominate at 57%, with exports 31% and transhipment 11%. Petroleum is the second largest category with 24 million tonnes or 33% of total throughput. Durban is thus both the largest container port and the largest petroleum port in the country.

Plans are under way to further expand the port with the primary objective of increasing container handling capacity, including the ability to accommodate larger vessels. Projects include:

- widening and deepening the harbour entrance (already completed);
- deepening the draft alongside berths to accommodate larger vessels, especially newer generation, larger container ships: this is a complex engineering challenge.

Major expansion is required of the capacity of the container berthing and handling facilities. Options include digging out the Bayhead area behind the existing DCT terminal, or digging out the old Durban International Airport site, 10 km south of the existing port. The latter option is preferred for the next round of major expansion.

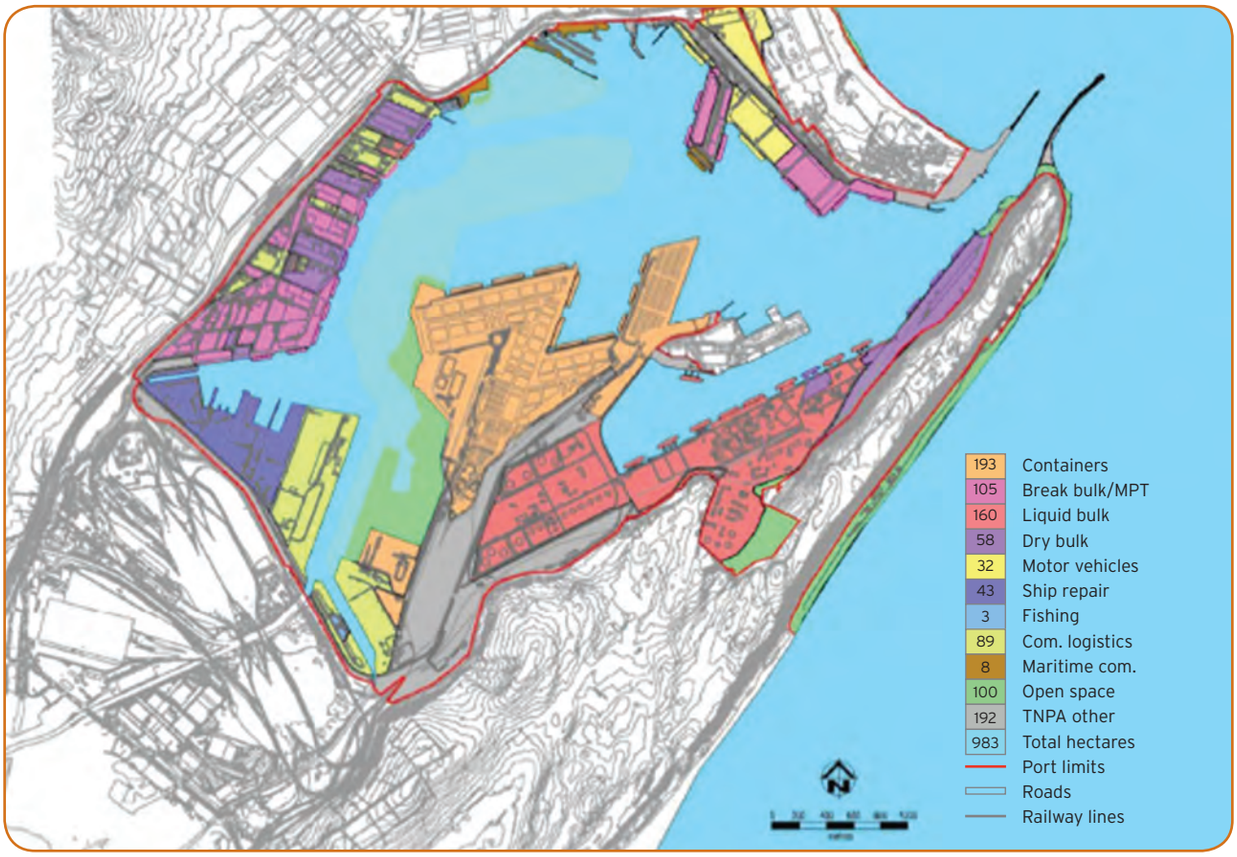


Figure 10: Port of Durban, layout of facilities

Source: Transnet Limited (2010a)

Table 11: Port of Durban throughput by cargo category, 2008/09 (million tonnes)

Category	Commodities	Tonnage	Sub-totals	% share
Dry bulk	Wheat and products thereof	1.05		1.4
	Other agricultural products	0.78		1.0
	Manganese ore	0.73		1.0
	Alumina	0.04		0.1
	Fertiliser and products thereof	0.73		1.0
	Wood chips	0.54		0.7
	Coal	1.58		2.1
	Other dry bulks	2.27		3.0
			7.70	**10.3**
Liquid bulk	Petroleum and products	24.42		32.7
	Animal and vegetable oils	0.73		1.0
	Chemicals	1.12		1.5
	Other liquid bulks	0.21		0.3
			26.48	**35.5**
Containers	2.56 million twenty-foot equivalent units (TEUs) @ 13.5 tonnes per TEU	34.56		46.3
			34.56	**46.3**
Vehicles	Vehicles on own wheels – 'roll-on; roll-off'	3.60		4.8
			3.60	**4.8**
Break-bulk	Steel and products thereof	1.03		1.4
	Citrus fruit	0.32		0.4
	Wood pulp	0.22		0.3
	Granite and products thereof	0.05		0.1
	Other break-bulks	0.68		0.9
			2.30	**3.1**
Total			**74.64**	**100.0**

Sources: Ports Regulator (2010a); KZN Freight Transport Data Bank (2011); Ports & Ships (2011); Consultant's calculations

Port of Richards Bay

The Port of Richards Bay was developed between 1972 and 1976 in response to the demand for additional rail-linked port infrastructure to service export potential from the (now) KwaZulu-Natal and Mpumalanga coalfields. A deepwater facility was needed because of the development internationally of very large bulk carriers. Richards Bay was chosen because of the large lagoon; the ease of dredging; direct links with the national rail network; an adjacent town, Empangeni, to stimulate initial development; and an ample supply of fresh water.

The port is now South Africa's premier dry bulk port, handling an increasing variety of bulk and neo-bulk commodities in addition to break-bulk. Much of the general cargo has resulted from businesses migrating away from Durban in recent years because of the abundant land and the generally less congested environment around Richards Bay. A small amount of container handling is also catered for. Figure 11 provides a diagrammatic view of the layout of the berths.

As at 2009, Richards Bay had 21 operational berths including those at the Richards Bay Coal Terminal, and also smaller quay facilities for berthing dredgers and tugs when not in operation.

The five-berth coal terminal is privately operated by the Richards Bay Coal Terminal Company. Other private operators in the port include: Island View Storage which operates a single bulk liquids berth adjacent to the coal terminal, and Sasol Agri which has facilities for bulk liquids storage as well as a phosphoric acid loading facility. Transnet Port Terminals (TPT) operates the dry bulk terminal for various ores, minerals and woodchip, as well as a multi-purpose/ break-bulk terminal handling ferrochrome, pig iron, steel, forest products, granite, aluminium, bagged cargo, containers, heavy lifts and abnormal loads.

Bunkering services in the port are provided by Joint Bunker Services which imports fuels from Durban or Cape Town for direct delivery to vessels in Richards Bay.

The Transnet National Port Authority (TNPA) operates five tugs, two pilot boats, and a service boat. The TNPA also undertakes dredging on a continual basis inside the port and immediately outside the entrance using a trail suction hopper-type dredger. Only limited ship repair facilities are available and there are no dry dock or floating dock services.

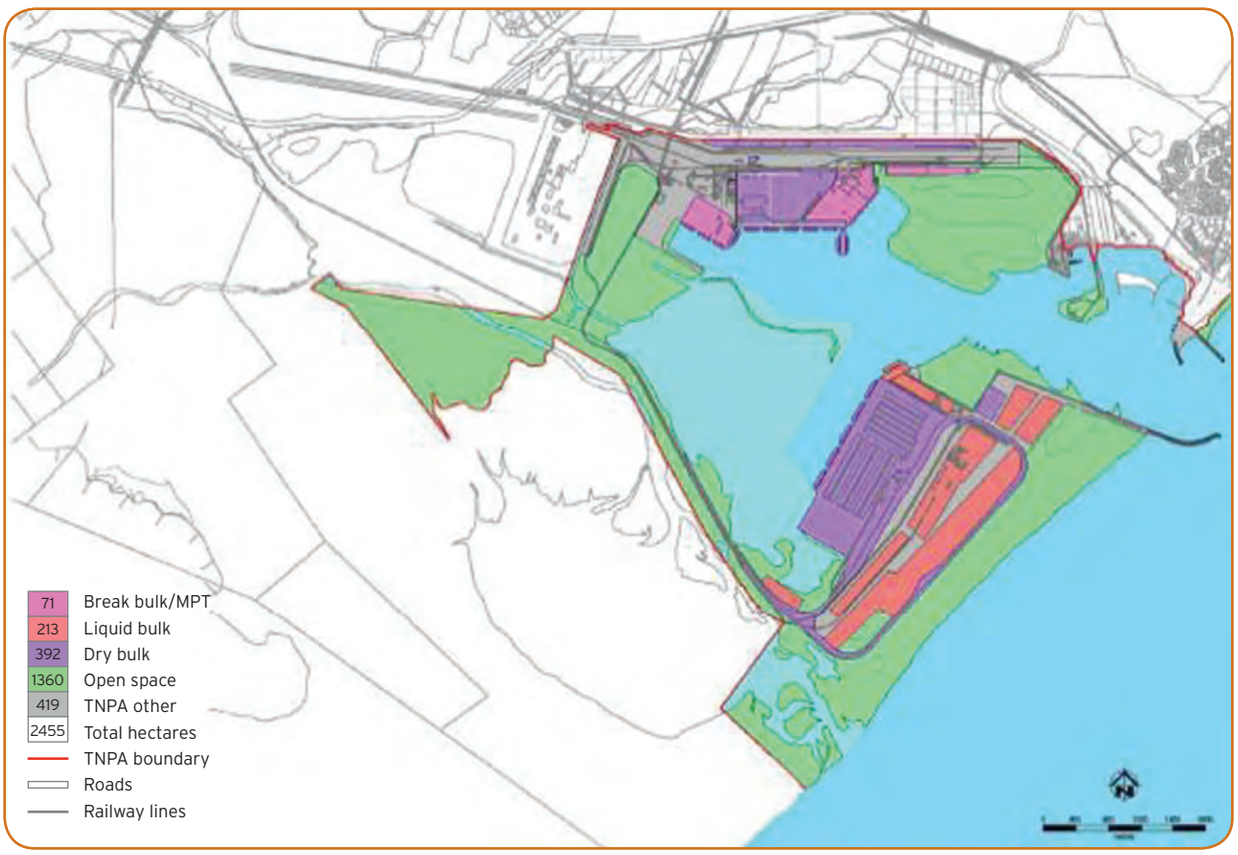


Figure 11: Port of Richards Bay, layout of facilities
Source: Transnet Limited (2010a)

Table 12 summarises the cargo throughput by category for the financial year 2008/09.

Table 12: Port of Richards Bay, throughput by cargo category, 2008/09 (million tonnes)

Category	Commodities	Tonnage	Sub-totals	% share
Dry bulk	Manganese ore	1.01		1.3
	Chrome ore	1.27		1.6
	Sulphur	0.84		1.0
	Alumina	1.53		1.9
	Titanium slag	0.77		1.0
	Wood chips	2.47		3.1
	Coal	66.08		82.4
			74.75	**93.2**
Liquid bulk	Petroleum and products	0.26		0.3
	Acids (mainly phosphoric)	0.61		0.8
	Chemicals	0.83		1.0
			1.70	**2.1**
Break-bulk	Granite/granite products	0.32		
	Ferro alloys	2.09		2.6
	Steel and steel products	0.42		0.5
	All other break-bulk	0.13		0.2
			3.75	**4.7**
Total			**80.20**	**100.0**

Sources: Ports Regulator (2010a: p35); Ports & Ships, (2011)

Total port throughput for 2008/09 was just over 80 million tonnes. By 2009/10, trade had recovered following the recession and total throughput for the year ending 31 March 2010 was around 85 million tonnes, of which 76 million tonnes was bulk goods, indicating that dry bulk including coal, was not the main factor causing the growth. Trade at the port of Richards Bay is dominated (82%) by coal exports, while total dry bulk throughput accounts for 93% of total volume. Wood chips (3.1%) and ferro alloys are the only other significant tonnages in volume terms.

In terms of port revenue, there is no direct relationship between volume and revenue: coal export accounts for 82% of volume; but earns only 30% of the port's total revenue. The other dry bulks, on the other hand, bring in 56% of revenue against just 11% by volume. Break-bulk, contributing only 4.7% of total volume accounts for 20% of earnings.

In terms of capacity expansion plans, the Coal Terminal has the capacity to export in the region of 90 million tonnes of coal per year which, with current levels of non-coal traffic, would take the total throughput to well over 100 million tonnes per year. Its plans to expand have, however, been postponed pending the availability of increased capacity on Transnet's coal line from Mpumalanga.

Port of Cape Town

The Port of Cape Town was established by the Dutch on 6 April 1652 when Jan van Riebeeck arrived in Table Bay to establish a supply station for the Dutch East India Company's ships on their voyages to and from the Dutch East Indies. The original 'inner' port developed steadily over the centuries and consists of what is today called the Victoria and Alfred Basins, home to the Cape Town Waterfront, but remaining in commercial use by smaller commercial vessels, including fishing and pleasure boats, and smaller passenger cruise ships. Repair facilities for smaller vessels are also found in this inner part of the harbour.

The newer and larger, Ben Schoeman Dock comprises the container terminal and the Duncan Dock with its multipurpose and fruit terminals, as well as a dry dock, repair quay and tanker basin. An extensive yachting marina is also found here. Unlike the original inner harbour, the Duncan Dock and subsequent container terminal developments required extensive land reclamation and extend up to 2 km further seaward than the original layout.

Figure 12 illustrates the layout of the port and the different terminal facilities.

The Port of Cape Town is not as significant in national trade terms as either Durban or Richards Bay, but serves a more regional function. However, because it is on the extremely busy east-west shipping route, it has a significant function as a trans-shipment hub for cargoes destined for West Africa from both the east and the west. Regular feeder services support this function. The port is, however, far more than merely a trading facility, with its very extensive fishing, ship repair and world famous Waterfront leisure facilities.

The port has 34 berths including lay-by berths. TPT operates the container terminal which has six deep sea berths equipped with post Panamax container cranes. TPT also operates the multipurpose terminal berths in the Duncan Dock part of the harbour, handling fruit (deciduous), steel, paper, maize, wheat, rice, timber, coal, scrap and various other general cargo. Passenger cruise vessels are handled mainly in the Victoria & Albert Dock with larger ships being accommodated in the multipurpose area of Duncan Dock.

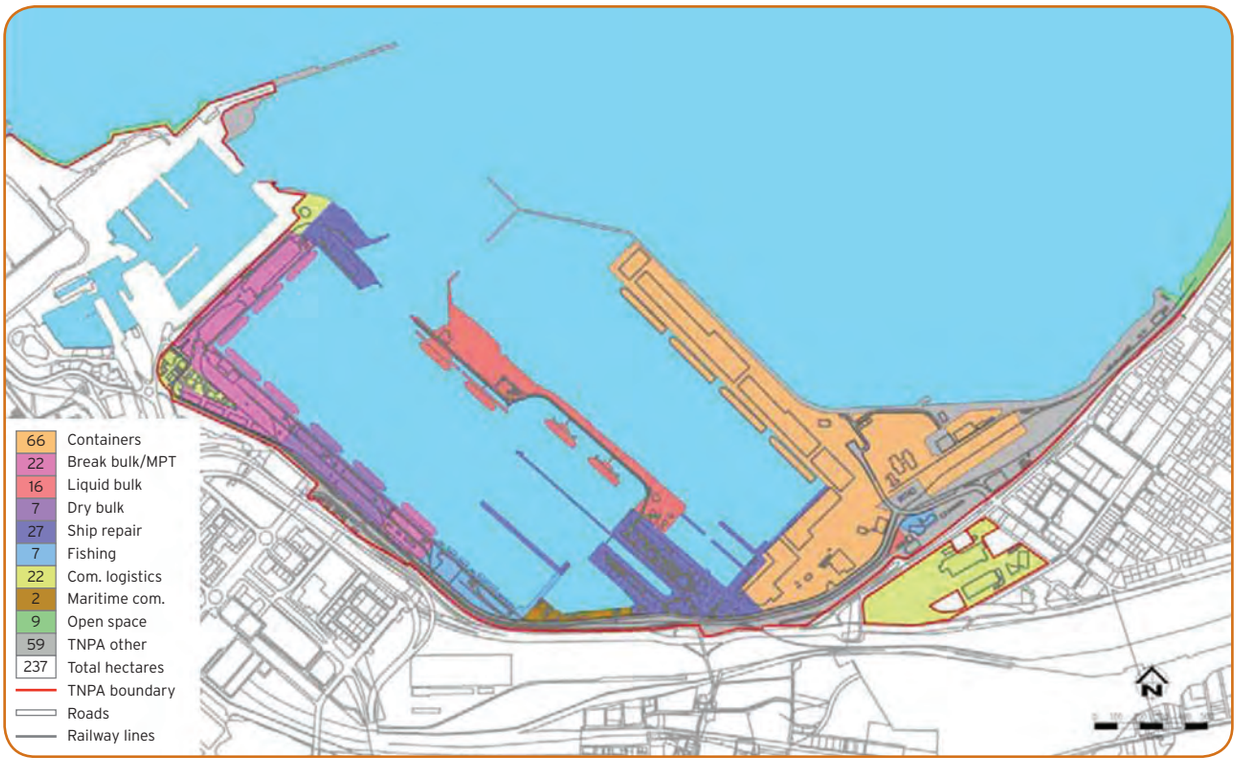


Figure 12: Port of Cape Town, layout and facilities
Source: Transnet Limited (2010a)

Table 13: Port of Cape Town, throughput by cargo category, 2008/09 (million tonnes)

Category	Commodities	Tonnage	Sub-totals	% share
Dry bulk	Wheat and by products	0.11		0.8
	Agricultural products	0.29		2.2
	Fertiliser	0.22		1.7
	Other dry bulks	0.19		1.4
			0.81	**6.1**
Liquid bulk	Petroleum and products	1.74		13.1
	Animal and vegetable oils	0.05		0.4
	Chemicals	1.02		7.7
			2.81	**21.1**
Break-bulk	Citrus fruit	0.07		0.5
	Steel and steel products	0.02		0.2
	Other break-bulk products	0.23		1.7
			0.32	2.4
Containerised	694,737 TEUs @ 13.5t/TEU	9.38		70.4
			9.38	**70.4**
Total			**13.32**	**100.0**

Sources: Ports Regulator (2010a); Ports & Ships (2011)

Private companies operate the refrigerated fruit and fish terminals although most deciduous fruit is now containerised.

Cape Town is an important repair facility, especially for the oil and diamond industries and the South Atlantic fishing industry. Extensive ship repair facilities are available at the 350 m long Sturrock dry dock and for smaller vessels there is a synchro lift in the Victoria & Albert Dock. The NPA offers the normal range of tug and pilotage services, as at Durban.

Table 13 summarises cargo throughput by category for the financial year 2008/09. Total port throughput for 2008/09 was over 13 million tonnes of which 70% was containerised. Liquid bulk at 21% was the second highest cargo type, influenced by 1.7 million tonnes of petroleum and related products.

In terms of capacity expansion plans, the most important project relates to increased container handling and depth of water at the container berths in order to be able to accommodate the larger, newer generation container vessels.

Port of Saldanha

Until the late 1970s the Port of Saldanha was a small fishing village. The opportunity to export iron ore from Sishen in the Northern Cape led to the construction of a 800 km railway line, together with storage and loading facilities for the largest dry bulk carriers in the world. The first vessel loaded with ore left Saldanha in September 1976. The construction of the Saldanha Steel Mill near the port led to the export of steel manufactured from more iron ore which is railed from Sishen directly to the mill.

The Port of Saldanha is the deepest port in the country and is able to accommodate vessels of up to 21.5 m draft. It has a 990 m long jetty containing two iron ore berths linked to the shore along a 3.1 km long causeway/breakwater. At the end of the ore jetty there is also a 365 m tanker berth. The ore export facilities incorporate tipplers to offload the ore trains, stacker/reclaimer equipment to load ore onto stockpiles and reclaim it onto conveyors which transport the material up to 7 km to the shiploaders on the jetties.

There is also 874 m of multipurpose quays for break-bulk cargo. These berths have a draught of between 12 m and 13.4 m. The multipurpose terminal handles various lower volume mineral exports, steel coils and pig iron. Imports include anthracite, coking coal and steel pellets.

NPA services include a fleet of three tugs with a fourth available from Cape Town to assist with vessels of greater than 19 m draft, for which regulations require four tugs. Pilotage service is compulsory and is provided by a diesel-powered pilot boat. The port also has two service launches. Ship repair is limited to fishing vessels, although diving services are available for vessel inspection. Vessels need to visit Cape Town for repairs.

In 2008/09 cargo handled by the port totalled about 51 million tonnes, including petroleum imports. Of this total 49 million tonnes was bulk cargo, with 34 million tonnes being exports and 14 million tonnes imports, and 1.7 million tonnes of trans-shipment. Of approximately 1 million tonnes of break-bulk, 90% was exports and 10% imports. The port handled no containers during this period. Table 14 details the trade through the Port of Saldanha for the year 2009/10.

Investments to increase the capacity of the port's ore handling equipment have recently been made to allow for increased ship loading capacity and to accommodate projected increases of throughput of ore on the Sishen Saldanha Orex line. Medium-term plans include the possibility of expanding secondary manganese exports currently handled by Port Elizabeth and soon to be transferred from Port Elizabeth to the nearby Port of Ngqura.

Table 14: Port of Saldanha, throughput by cargo category, 2008/09 (million tonnes)

Category	Commodities	Tonnage	Sub-totals	% share
Dry bulk	Iron ore	32.98		65.30
	Coal	0.86		1.70
			33.84	**67.00**
Liquid bulk	Petroleum and products	15.71		31.10
			15.71	**31.10**
Break-bulk	Granite and granite	0.02		0.04
	Steel and steel products	0.57		1.10
	Other general cargo	0.37		0.70
			0.98	1.90
Total			**50.53**	**100.00**

Sources: Ports Regulator (2010a:p35); Ports & Ships (2011)

Port of Port Elizabeth

After its formal establishment in 1825, the Port of Port Elizabeth grew rapidly and by 1877 had become the principal port of the colonies in value terms at least, primarily because of the valuable merino wool export trade. Notwithstanding this early success, the port lacked modern infrastructure and it was only in 1935 that the main Charl Malan quay was constructed.

Port Elizabeth's infrastructure comprises the following terminals:

- TPT container terminal (3 berths totalling 925 m)
- TPT break-bulk terminal (6 berths totalling 1170 m)
- TPT bulk terminal (manganese ore)
- TPT car terminal (1 berth)
- TPT tanker terminal
- Fresh produce terminal (private)

The container terminal is equipped with the latest generation gantry container cranes and straddle carriers. Containers can be loaded direct to rail if required, with rail lines coming onto the quayside underneath the gantry cranes. In addition, there are jetties for tugs (120 m), fisheries (165 m) and larger trawlers (136 m).

The port has a small facility for the navy, although no ships are permanently based at Port Elizabeth. There is also a yacht basin. Figure 13 illustrates the layout of the port infrastructure.

The principal goods moving through the Port of Port Elizabeth are containerised imports and exports, much of it in support of automotive manufacturing, and manganese ore exports. Between them, these two trades account for 85% of all trade at Port Elizabeth. The container trade is fairly well balanced, with 55% imports and 45% exports.

There are some car imports/exports, though not on a scale as large as East London. Fruit exports, principally citrus, are also important. Bulk fuel is also imported, coastwise from other South African ports. The data is summarised in Table 15.

A significant expansion plan for the Port of Port Elizabeth will be triggered by Transnet's investment in increased capacity of the rail line from the Northern Cape to Port Elizabeth, to allow expansion in manganese throughput by up to 5.2 million tonnes. For the longer term growth in manganese exports, Transnet is proposing to either use Ngqura or expand capacity at Saldanha Bay.

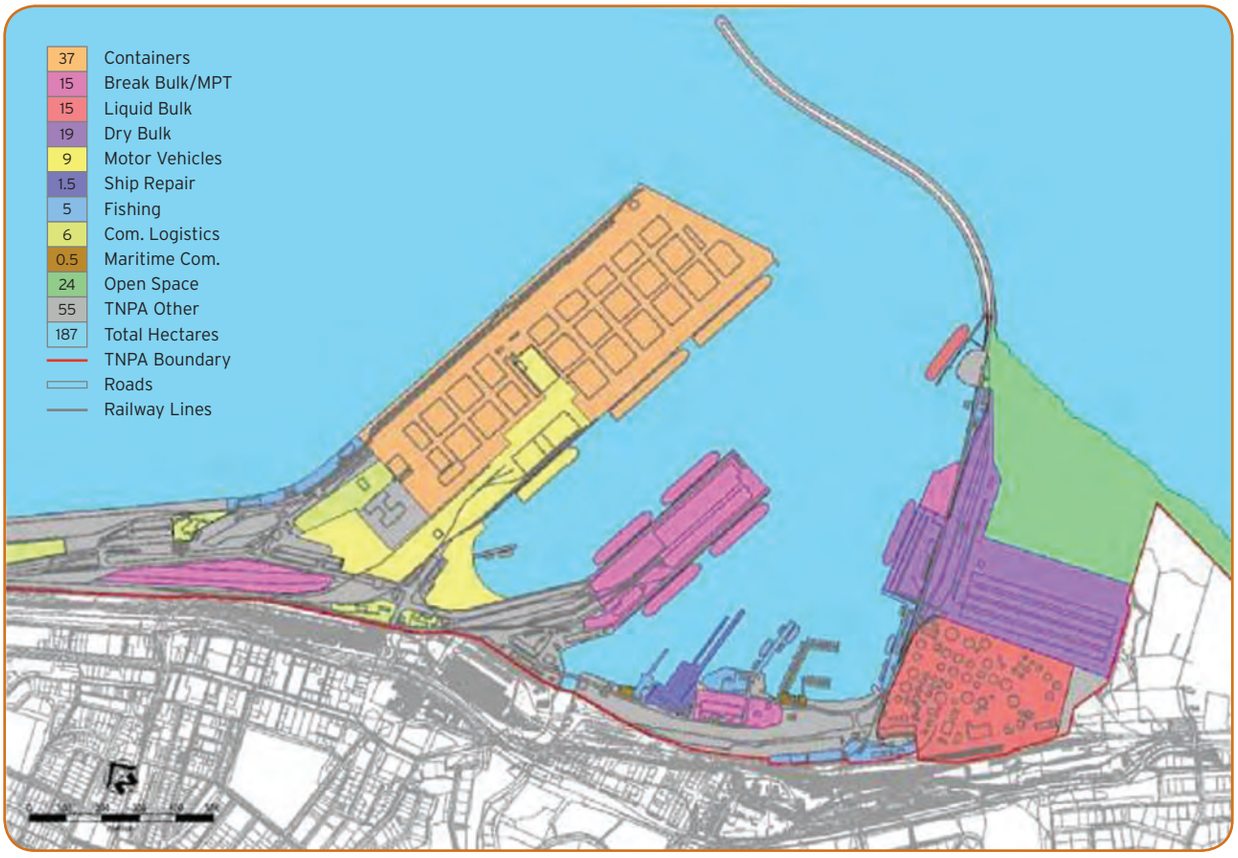


Figure 13: Port of Port Elizabeth, layout of facilities
Source: Transnet Limited (2010a)

Table 15: Port Elizabeth, throughput by cargo category, 2008/09 (million tonnes)

Category	Commodities	Tonnage	Sub-totals	% share
Dry bulk	Manganese ore	2.72		28.6
	Woodchips	0.01		0.1
			2.73	**28.7**
Liquid bulk	Petroleum and products	1.01		10.6
			1.01	**10.6**
Containers	399 000 TEUs assessed at 13.5 tonnes/TEU	5.40		56.7
			5.40	**56.7**
Cars	That is, vehicles on own wheels – 'roll-on; roll-off'	0.07		0.7
			0.07	**0.7**
Break-bulk	Citrus fruit	0.10		1.1
	Steel and products	0.11		1.1
	Other break-bulk	0.10		1.1
			0.31	**3.3**
Total			**9.52**	**100.0**

Sources: Ports Regulator (2010a); Ports & Ships (2011)

Port of Ngqura/Coega

The Port of Ngqura is South Africa's newest port. It is situated 20 km northeast of Port Elizabeth and opened for container operations in October 2009. The NPA is responsible for developing the deepwater port, while TPT was appointed to handle all terminal operations, currently all containerised. The port is of deepwater construction, capable of serving post-Panamax dry and liquid bulk vessels. Container ships initially of 4500 TEU capacity are catered for, but with design provision for subsequent deepening to accommodate new generation 6500 TEU vessels.

The port consists of a main eastern breakwater 2700 m in length, extending into Algoa Bay to a maximum water depth of 18 m, and a secondary western breakwater 1125 m in length. The initial port development comprises five berths, or 1800 m of quay wall. Two are for container vessels, two for dry bulk and break-bulk cargo, and one for liquid bulk. The port development master plan makes provision for an eventual total of 32 berths.

Adjacent to the port is the 12 000 hectare Coega Industrial Development Zone (IDZ), with 4500 hectares identified for development. The objective is that the IDZ will serve as a location for export oriented economic activities. Figure 14 illustrates the layout of the port facilities.

The Port of Ngqura opened for business in October 2009 with two deep-sea container berths. In its first year of operation it handled 250 000 TEUs, or approximately 3.5 million tonnes of cargo, almost all of which was containerised. Some 40% of this was trans-shipment trade, as summarised in Table 16.

Investment continues to consolidate the first stage of development, but plans to expand the port to five berths have been postponed because of the global economic downturn.

Table 16: Port of Ngqura/Coega, throughput by cargo category, 2009/10 (million tonnes)

Category	Commodities	Tonnage	Sub-totals	% share
Containers	Import/export 150 000 TEU at 13.5 tonnes/TEU	2.05		60.0
	Trans-shipment 100 000 TEU at 13.5 tonnes/TEU	1.35		40.0
Total		**3.40**	**3.40**	**100.0**

Sources: Ports Regulator (2010 a); Ports & Ships (2011); Transnet (2010a)

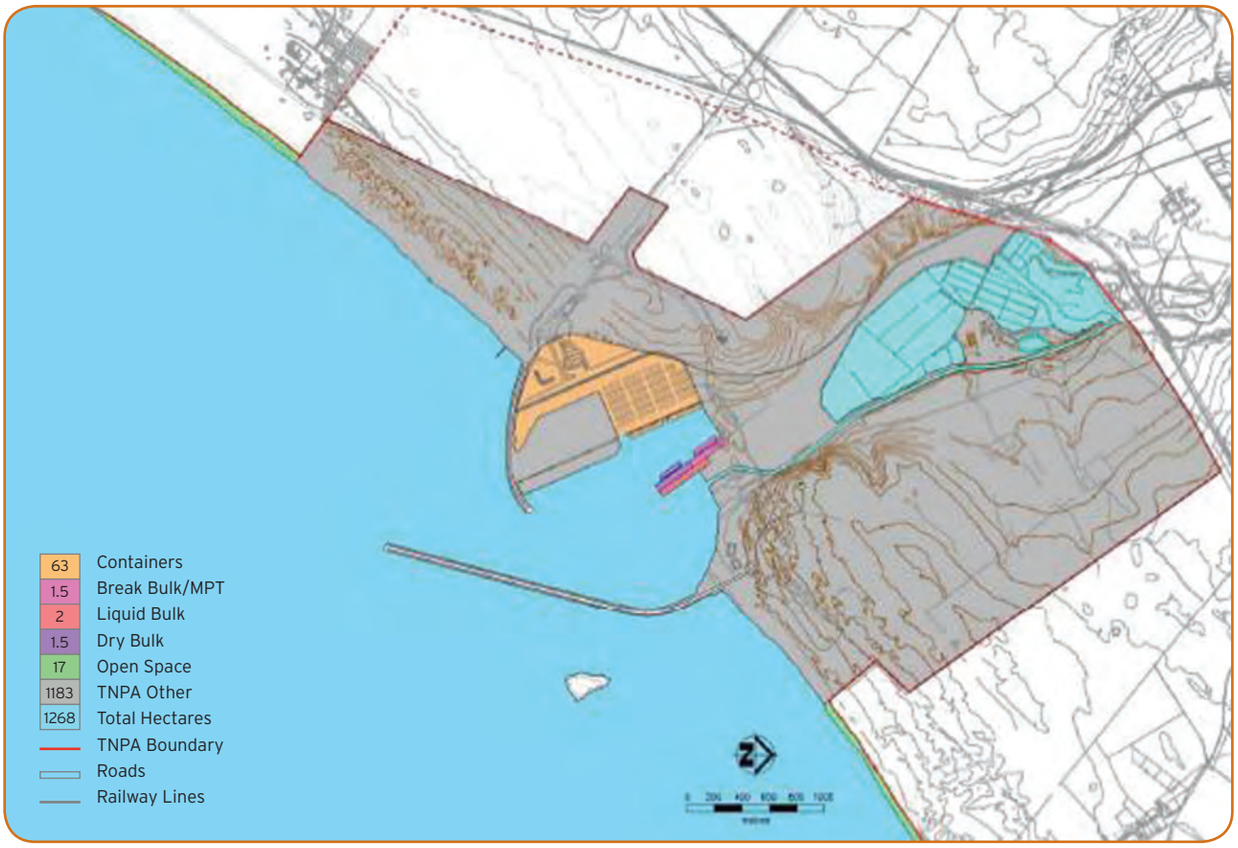


Figure 14: Port of Ngqura/Coega, layout of facilities
Source: Transnet Limited (2010a)

Port of East London

The Port of East London is South Africa's only remaining river port and is situated at the mouth of the Buffalo River in the Eastern Cape Province. The port consists of a multipurpose terminal (including a container terminal) on the East Bank, and a bulk terminal (grain elevator) and car terminal, both on the West Bank. The port has a total of 2410 m of quayside with a total of 12 commercial berths, of which six are on the West Bank.

In past decades, East London was one of the main maize exporting ports of the country. The grain terminal, which includes the largest grain storage elevator in the country – and which used to export several million tonnes of maize annually – has fallen into disuse in recent years as overall maize exports declined. Deterioration in the condition of the overhead handling gantries led to the facility being under threat of closure until Transnet recently announced plans to invest in upgrading it. Alternative means of discharging and loading grains have had to be found in the interim to handle wheat imports required by local milling businesses. The automotive sector has now largely overtaken grains as the dominant business of the port.

The port has extensive ship repair facilities including a dry dock capable of handling ships of up to 200 m. Bunkering with fuel oil and marine gas oil is available from on-shore pipelines at two of the berths on the West Bank. Cruise ships are usually accommodated at the East Bank multipurpose terminal. Figure 15 illustrates the general layout of the port.

Car imports and exports are now the main trade, by value, through East London, together with a container trade, largely in support of the automotive industry. Containers are handled by ships gear only, as the port has no container gantry cranes. Petroleum is the largest trade by volume.

The total throughput of 2.7 million tonnes in 2008/09 included 0.5 million tonnes of imported or exported cars, as well as nearly 0.8 million tonnes of containerised goods, much of which comprised materials to support car manufacturing. Table 17 provides the detailed analysis.

In terms of expansion plans, the car terminal and its associated multi-storey parking garage is to be expanded to increase the parking garage to eight storeys. Furthermore, Transnet plans to refurbish the grain elevator and handling gantries in order to support the expansion of wheat imports and maize exports.

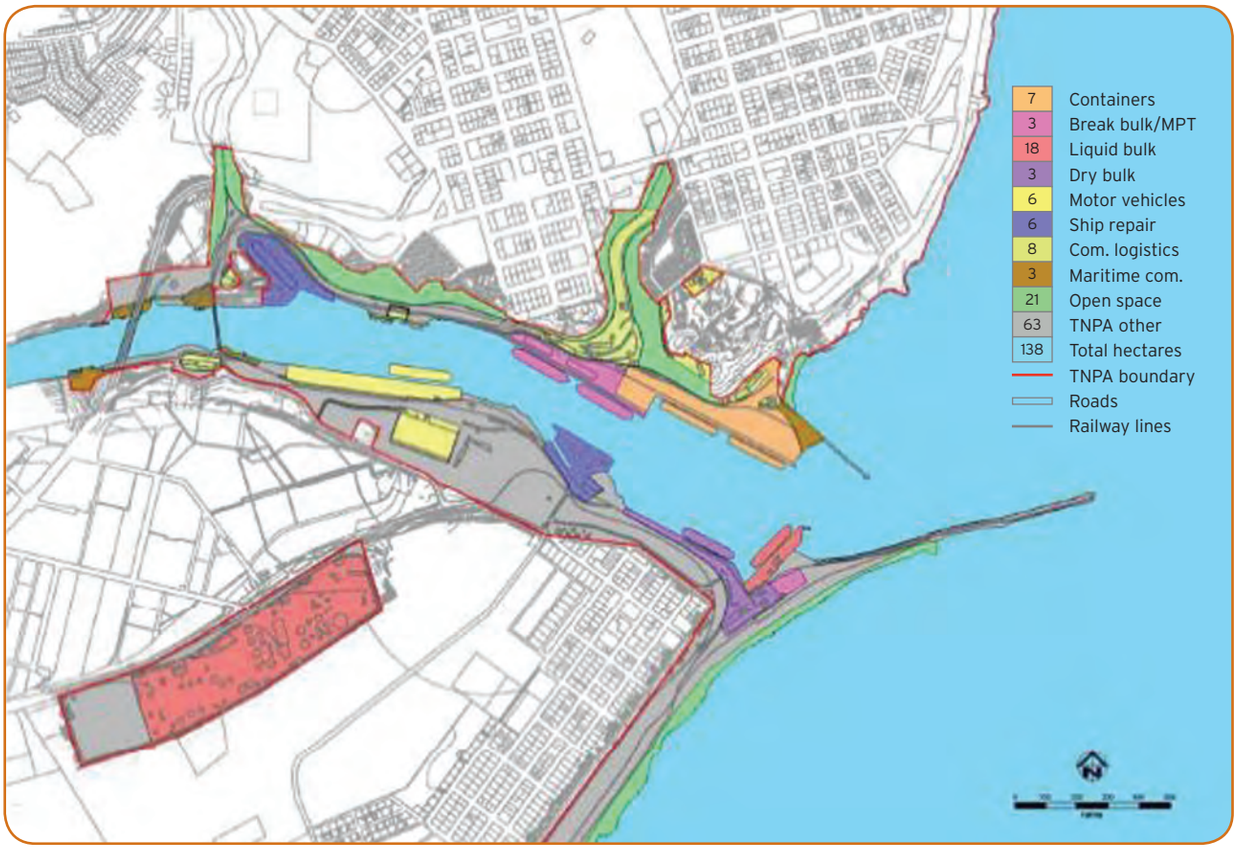


Figure 15: Port of East London, layout of berths and facilities

Source: Transnet Limited (2010a)

Table 17: Port of East London, throughput by cargo category, 2008/09 (million tonnes)

Category	Commodities	Tonnage	Sub-totals	% share
Dry bulk	Wheat/wheat products	0.07		
	Other agricultural products	0.03		
	Other dry bulks (maize)	0.32		
			0.42	**15.6**
Liquid bulk	Petroleum and products	0.87		
			0.87	**32.3**
Containers	Based on 56,767 TEUs	0.77		
			0.77	**28.5**
Cars	That is, vehicles on own wheels – 'roll-on; roll-off'	0.51		
			0.51	**18.8**
Break-bulk	Steel and steel products	0.03		
	Other break-bulk products	0.10		
			0.13	**4.8**
Total			**2.70**	**100.0**

Sources: Ports Regulator (2010a); Ports & Ships (2011)

Port of Mossel Bay

The Port of Mossel Bay is almost entirely dedicated to the support of the off-shore oil industry. There are two off-shore mooring buoys inside port limits, of which one is a marine tanker terminal single point mooring buoy used by feeder vessels feeding the refineries in Durban and Cape Town. The harbour itself caters mainly for fishing vessels and service vessels for the off-shore oil industry. Bunkering for small vessels is available at the quayside and on the jetty. Figure 16 illustrates the port's location and layout.

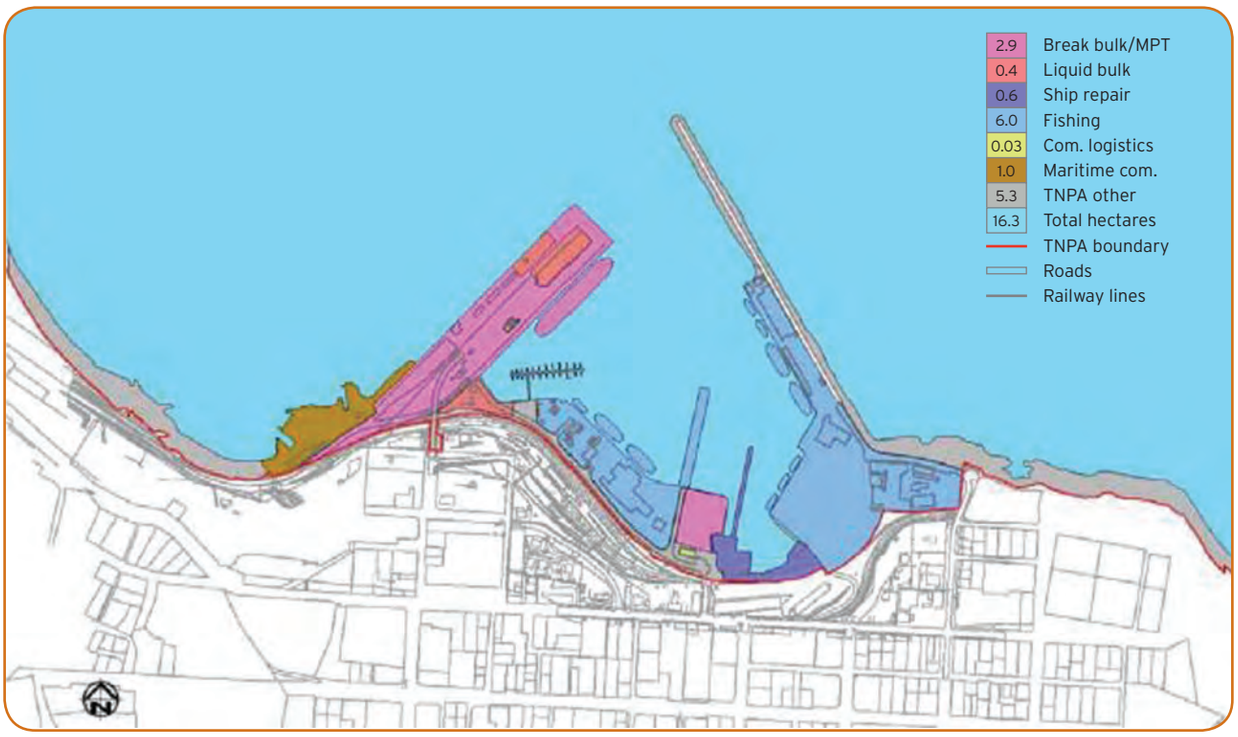


Figure 16: Port of Mossel Bay location and layout
Source: Transnet Limited (2010a)

Table 18 summarises cargo throughput, which is almost entirely petroleum products.

Table 18: Port of Mossel Bay, throughput by cargo category, 2008/09 (million tonnes)

Category	Commodities	Tonnage	Sub-totals	% share
Liquid bulk	Petroleum and petroleum	1.78		96.2
			1.78	**96.2**
Break-bulk	Miscellaneous products	0.07		3.8
			0.07	**3.8**
Total			**1.85**	**100.0**

Sources: Ports Regulator (2010a:p35); Ports & Ships (2011)

Operational issues

Having outlined the salient features of each of South Africa's commercial ports, the key overarching operational issues are now analysed. There are a range of such issues which constrain South African ports from realising the overall objective of the ports sector, which is *to provide capacity ahead of demand and to achieve globally benchmarked performance*. The key issues are:

- Cargo handling productivity, especially with respect to containers;
- Leasing and licensing of port facilities and services by the National Ports Authority (NPA);
- The relationship between port productivity and port capacity; and
- Transport access generally, and the relationship between ports and railways in particular.

The Ports Act sets out the respective roles of the National Ports Authority (NPA) and the Ports Regulator in achieving national policy objectives. Although both these parties are mandated to implement the National Ports Policy and Ports Act (Government of RSA 2005), Transnet also has a commercial mandate to cover its costs and make a return on investment. Transnet occupies a dominant role in the transport sector as sole owner of the ports (via the NPA) and main operator in the ports (via TPT), as well as being sole owner and operator of the freight rail and fuel pipeline networks, both of which are linked to the ports. Notably, Transnet Port Terminals (TPT) has a dominant position, especially in the case of container terminals where it controls nearly 100% of all business.

The productivity of a port can be measured in many different ways, and the various measures are more important to some stakeholders than to others:

- How many lifts per hour (e.g. containers) or tonnes loaded (e.g. bulk coal) per hour. This measure is critical to ensure that very expensive cargo handling equipment is paying for itself and that the terminal operator is optimising revenue earning capacity.
- Ship turnaround time – i.e. how long a ship spends waiting, plus the time in the port. This measure is critical to shipping line owners especially in container trades, because of the high value of the goods on board the vessel, as well as the vessel's high operating costs.
- The time taken to move goods between the third party logistics solutions (3PLS) facilities adjacent to the port and the port's short-term holding areas prior to loading/discharging the ship. This measure is of particular concern to dispatchers and consignees. Time 'in depots' can often be longer than the time goods spend either in port or during inland transport.
- How long a consignment, e.g. containers, actually spends within the port. Although this adds to the dispatcher/consignees' concerns, it is also of concern to the port landlord because revenue based on port throughput (cargo dues) is constrained. Delays here can also impact on each of the other measures of productivity.

For a port to be efficient there needs to be a good level of productivity on all the above measures. This in turn requires effective cooperation among all stakeholders: the landlord; the terminal operator/s; the seaward services providers; and the logistics services companies. Efficient ports find ways of operating that permit progress on all measures to be prioritised. If one stakeholder has too dominant a position, it is possible that they may focus too closely on the productivity measure closest to their commercial interest. As a result, even though progress may be made on that measure, it may not make much difference to overall port productivity.

In South African ports, Transnet Port Terminals has a dominant position; especially in the case of container terminals where it controls nearly 100% of all business. Significantly, the container category of cargo is also by far the highest revenue earning handling category. TPT also controls 100% of car trade which is also a high-earning category. Table 19 compares the share of trade at the three main container ports by volume of throughput and by revenue. It shows that the container trade is even more dominant in revenue terms than it is in volume terms.

Table 19: Analysis of SA ports trade by handling categories in volume and revenue terms[4]

Cargo handling category (with % ownership by Transnet of each category)	Durban		Port Elizabeth		Cape Town	
	% vol	% rev	% vol	% rev	% vol	% rev
Containers (97%)	46.3	74.1	56.7	81.9	70.4	91.6
Cars (100%)	4.8	13.3	0.7	10.7	-	-
Dry bulk (37% – see note)	10.3	3.4	28.7	3.7	6.1	4.8
Liquid bulk (37% – see note)	35.5	7.6	10.6	2.8	21.1	2.6
Break-bulk (78%)	3.1	1.6	3.3	1.1	2.4	1.6

Sources: Ports Regulator (2010a:p35); Ports & Ships (2011); Consultant's analysis

4 Note: Liquid bulk and dry bulk together are 37% Transnet controlled; the percentages for each may be different.

While Transnet has expressed concern about its low container handling rates (it reports an average of 22 lifts per hour in its ports, against a global benchmark of over 30), its dominant position within the high revenue cargo handling categories places it under very little competitive pressure to address any operational inefficiencies.

A benchmarking study of port performance criteria and port tariffs in various ports around the world was carried out by the South African Ports Regulator (Ports Regulator, 2010b). It found that tariffs in South African ports tend towards the high end of the spectrum and that performance is well below international benchmarks. The study showed, for example, that it costs a container ship a total of $182 151 to dock in Durban. The second most expensive port, as at April 2010, was Long Beach California in the US at $175 230, followed by Los Angeles at $164 431. The average tariff of the ports surveyed was just over $65 000. This is illustrated in Figure 17.

Furthermore, the regulator found that existing capital deployed is inefficient and hence Transnet should not be permitted to raise funds for additional investment in ports before showing improvement in the use of existing assets.

These operational concerns were well understood when the National Ports Act was prepared and provision was made to progressively dilute Transnet's operational dominance. Although the Act provides for retention of ownership of infrastructure in public hands, whenever opportunities emerge for the creation of new ports or terminals within ports, or when licences of port services contractors expire, the NPA is required to invite tenders from suitable candidates from the public or private sectors. In this way, competition can be introduced with the objective of progressively improving operational effectiveness and efficiency in the ports. In practice, however, new capacity has not been put out to tender.

Finally, access to ports is important for effective operational performance. This is especially true for the older ports where access is hampered by dense urban development. Cape Town and Durban, the two main container ports of the country, are both constrained by the interaction between port access traffic and city traffic.

What, then, is the most efficient way of improving port performance? The most effective approach would be to create incentives for port performance improvement by:

- addressing Transnet's dominance, especially in the high revenue handling categories; and
- encouraging more diligent implementation by the NPA of its duties under the Ports Act.

In practice, however, Transnet tends to focus more on continued capital investment to create new capacity than it does on better use of existing capacity (Ports Regulator, 2010b). Transnet itself acknowledges that the performance at its container terminals is unacceptable. It also acknowledges that it is not making efficient use of its existing capital assets and is prioritising achieving productivity improvements in all aspects of its business (Transnet Limited, 2010b). In responding to these challenges there are plans to increase investment still further (as outlined in its 'Quantum Leap' Strategy), although attention will have to be given to the institutional impediments that are causing its inefficiency.

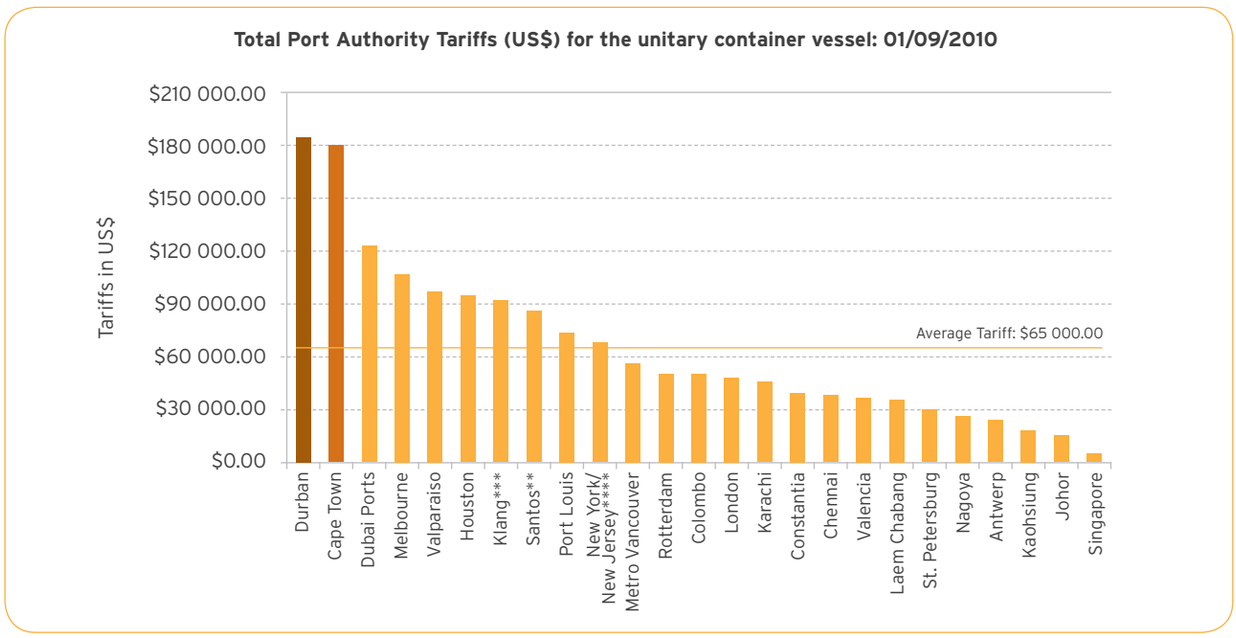


Figure 17: Port Authority tariffs at selected ports – Durban (on far left) highest
Source: Ports Regulator (2010 b)

The effective resolution of operational problems in South Africa's commercial ports requires constructive relationships among stakeholders, which also applies to transport access to all ports. Clear policy and statutory guidelines are now available to guide these relationships and offer solutions to how operational efficiency issues can be addressed.

Value of port assets

The book value of Transnet ports (NPA and TPT) is estimated at R40 billion and its replacement value at R80 billion, yielding a ratio of book to replacement value of 0.5. Table 20 shows the current and book value of the assets of Transnet as a whole.

The estimate of the asset value for Transnet's divisions is deduced from an analysis of Transnet accounts as published in the GCE's Annual Review and shown in Figure 18. In particular, it is based on the fact that while the rail divisions of Transnet contribute a larger share of group revenue after interest, tax, depreciation and amortisation than they do to earnings before these deductions, the port divisions show a higher share of earnings before the deductions than after.

It is therefore possible to deduce that more interest, tax, depreciation and amortisation are deducted from the port divisions' revenue than from that of the rail business. This suggests, in turn, that the port businesses are more highly capitalised, and profitable, than the rail businesses and that their assets are newer. By the same token, it means that the rail assets are on average much older; and that the rail divisions are less profitable. As a result, the book (accounting) value of port assets is relatively close to their replacement value, while for rail, the book value is much lower than the replacement value.

What this implies, in general, is that the ports sector contains a high proportion of the 'collateral' against which Transnet will be able to raise funds. More specifically, it also suggests that Transnet will tend, from an accounting point of view, to rely heavily on the ports divisions as collateral against which to raise funding for its less asset-healthy rail business.

The analysis of the asset values of the railways and ports may provide a useful indicator of how much it is actually worth investing in the respective sectors. The implication is clear that Transnet may be over-investing in at least some parts of the rail sector, using the higher earning sections of its ports business to sustain this over-investment.

Table 20: Asset value of Transnet, National Ports Authority and Transnet Port Terminals[5]

Transnet/Transnet division	Book value of assets (R billion)	Replacement/ current cost assets (R billion)	Ratio of book value/ current value
Transnet	114	158	0.72
Transnet Freight Rail (TFR)	40	80	0.50
Transnet Ports (NPA/TPT)	40	48	0.83
Other (pipelines)	24	30	0.80

Sources: Transnet Limited (2010 a); Thomas & Transnet Limited (2010)

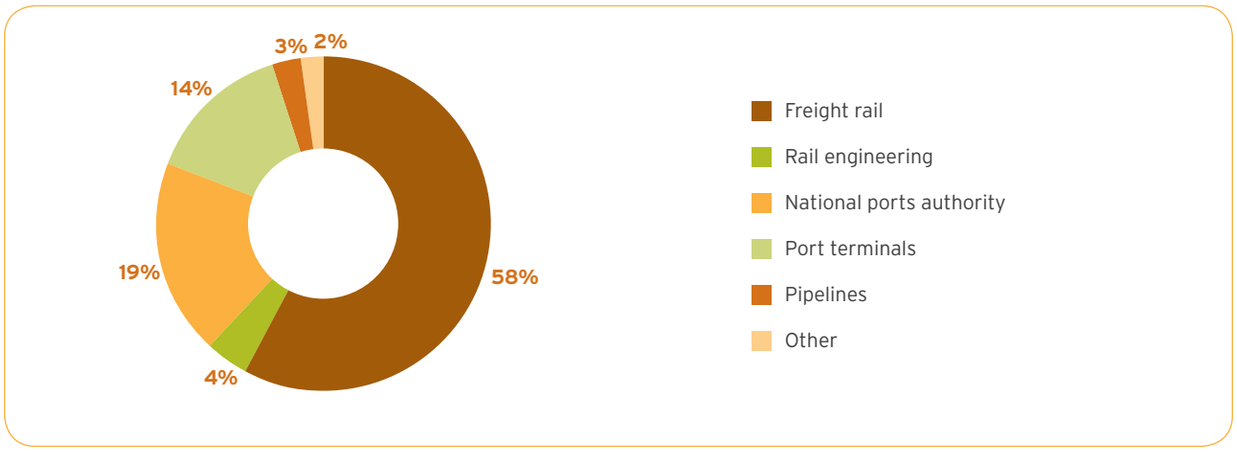


Figure 18: Contribution by Transnet divisions to external revenue, 2010 (%)
Source: Transnet Limited (2010b)

5 The assets of private terminals within the ports are not included in this table.

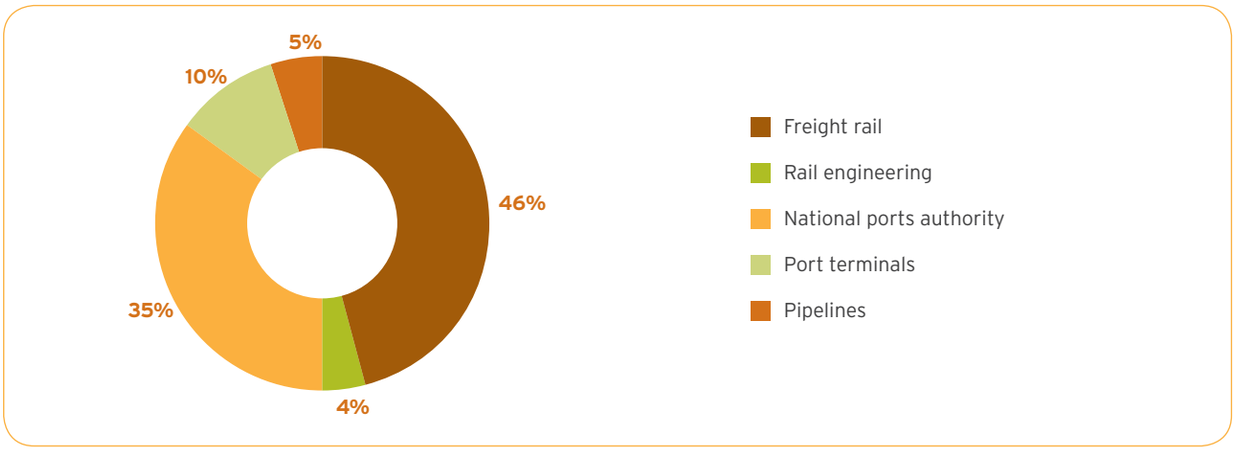


Figure 19: Contribution by Transnet divisions to EBITDA, 2010 (%)[6]

Source: Transnet Limited (2010b)

New investment projects

Transnet's ports investment programme is focused on expanding handling capacity at the main container ports of Durban, Cape Town and Ngqura. It is also upgrading the ore handling capacity at the Port of Saldanha. The handling capacity of especially the bulk ports is closely linked to the capacity of the dedicated bulk rail lines which serve them. Table 21 summarises current and immediate future investment projects in ports and their associated rail links.

Table 21: Port and port related investment – Transnet capital projects[7]

Project	Future capacity	Estimated total costs (R million)	2010 actual spending (R million)	Spend from project inception to 31 March 2010 (R million)	5-year planned spending (R million)
Coal line expansion	81mt	3 839	453	2 189	1 029
Ore line Phase 1A and B (ports)	47mt	2 549	194	2 229	163
Ore line Phase 1A and B (rail)	47mt	6 974	906	4 185	2 312
Ore line Phase 1C (ports)	60mt	567	283	343	137
Ore line Phase 1C (rail)	60mt	3 722	452	461	2 610
Cape Town container terminal expansion	0.9 million TEUs	4 375	868	2 278	2 649
Ngqura container terminal	0.8 million TEUs	7 888	1 198	4 326	1 032
Durban harbour entrance channel widening	9 200 TEU vessels	3 360	781	2 770	566
Durban container terminal re-engineering	2.9 million TEUs	1 863	500	1 245	452
Total port-related investment programme		**35 137**	**5 635**	**20 026**	**10 950**
Total ports investment only		**20 602**	**3 824**	**13 191**	**4 999**

Source: Transnet (2010b)

6 EBITDA = Earnings before interest, tax, depreciation and amortisation.
7 Specific port investments are highlighted in shaded components of the table.

With regard to long-term growth in container terminal capacity, Transnet is looking beyond current investment programmes to a projected growth of up to six times the current national container throughput of around 3.5 million TEUs. A comprehensive container strategy is being developed, including both port capacity and inland terminals.

Development plans for Durban include the proposed procurement of Salisbury Island in the port which will permit additional capacity of approximately 600 000 TEUs to be created after further investments. For growth beyond this stage, Transnet is considering the option of purchasing the former Durban International Airport site, for use for both third person logistics services (3PLS) activities and a possible future dig-out port.

In the case of bulk minerals exports, Transnet is conducting feasibility studies with the iron ore and manganese exporters to determine the viability of options for future expansion. These include options to increase iron ore export capacity to over 80 million tonnes eventually.

Manganese ore is currently exported via Port Elizabeth which has a maximum potential of about 5.5 million tonnes per year. Manganese exporters would like to see annual export capacity growing to at least 14 million tonnes. Transnet therefore plans to relocate the manganese ore export terminal away from Port Elizabeth, to either Ngqura or Saldanha.

Legislation, policy, regulation and institutions

Although the ports and rail sectors in South Africa share a common institutional heritage with, and are still part of a single organisation, Transnet, there are some very important differences that affect any consideration of the future direction of the ports sector:

- Unlike the rail sector, the ports sector has a long tradition of private sector involvement, some of it pre-dating the consolidation of ports and harbours legislation via the 1916 South African Railways and Harbours Regulation, Control and Management Act.
- There has been substantial institutional development in the ports sector in recent years, with the 2002 White Paper on National Commercial Ports Policy, leading to the National Ports Act of 2005.

The purpose of the ports White Paper and then the Ports Act was to clarify what the economic role of the ports should be, and to provide an institutional framework to permit the ports sector to optimise its economic contribution. Both the policy and the Act seek to create a degree of separation between the ports and railways, and also between the institutional and the operational aspects of running the ports sector. Thus the National Ports Authority (NPA) and Transnet Port Terminals (TPT) were constituted with separate and clear mandates:

- The NPA is the ports 'landlord', entering into leases with both public sector and private sector terminal operators and also granting licences to public and private sector contractors to provide the services involved in safe handling of ships and their cargoes.
- TPT is the state-owned terminal operating division of Transnet. It is the dominant player in the ports sector, controlling virtually all the high value containerised and roll-on roll-off cargoes, as well as having substantial break-bulk, dry bulk and liquid bulk facilities.

To ensure that the White Paper policy objectives for the ports sector are actually achieved, the Ports Act also makes provision for a Ports Regulator, accountable directly to government and not to either the institutional or operational arms of the ports sector itself. The task of the Regulator is to receive and consider complaints from industry stakeholders about practices which they believe to be contrary to the intentions of policy and legislation. The Regulator will investigate such queries, inviting both parties to submit their views. A ruling will then be made which can only be challenged in terms of compliance with relevant regulations. The factual aspects of determinations are final.

Although this appears to give considerable powers to the Regulator, in practice (partly for resource reasons): only a relatively small number of issues can be handled effectively; and the Regulator has a staff of about 10 and a budget in the region of R5 million per year. Within this budget the Regulator needs to conduct the detailed research needed to ensure that cases it hears are fully researched and able to stand up to the rebuttal evidence of the party complained against. When it is Transnet that is the defending party in such complaints, the limited resources of the Regulator's office restricts both the number of cases that can be taken on and the depth with which they can be analysed.

Of possibly greater significance in addressing broader issues of non-compliance with policy and legislation is the Regulator's ability to commission independent research into port practices and costs elsewhere in the world, and also into the general issues surrounding the economic impact of the current institutional structure of the ports industry in South Africa.

Financing in the ports sector

Transnet (2010a) states that the key imperatives for its funding strategy include: raising cost-effective funding ahead of demand; diversifying Transnet's funding sources, both in the domestic and international markets; and minimising market risk, foreign exchange risk, and interest rate risk. In 2009/10 the funding requirement was R20 billion, including maturing debt. This was driven primarily by the need to fund the capital investment plan. During the year, Transnet raised the required R20 billion including pre-funding.

Transnet established its US$2 billion Global Medium Term Note (GMTN) programme, enabling the company to issue bonds in the euro, dollar and pound sterling markets. Post-balance sheet, an international investor road show was conducted in Europe (UK and Germany) and the United States, in keeping with the strategy to diversify funding sources. In addition, Transnet started negotiations with the African Development Bank (AfDB) for a substantial loan facility. Discussions are at an advanced stage, and a due diligence exercise was conducted by the AfDB.

Transnet's objective is to continue its current practice of self-funding: i.e. borrowing on the strength of its financial position without reliance on government subsidies or guarantees. A key part of this plan will be vigilant monitoring of adherence to the key financial metrics, such as cash interest cover, and maintaining and improving Transnet's positive standalone investment-grade credit rating.

The Ports Regulator paints the following picture (2010a:53):

- Capital investments by Transnet ran to R80 billion in its five-year investment plan [...] Financing this capital expenditure programme in Transnet's case is through ongoing operations and debt (not state guaranteed) raised on its balance sheet. Strategic port pricing practiced by the Port Authority through charging cargo dues, ostensibly to pay for infrastructure, makes the largest contribution to Transnet group profit and its ability to carry out its investment plan.
- Debt has been raised on the assets of the Transnet group, including port assets. Debt and ongoing investment is financed by the rents raised by cargo dues collected by the Port Authority. Corporatising the Port Authority will increase Transnet's tax liability. Under the current divisional structure within which Transnet organises its operating arms, the above normal profits earned by the Port Authority are consolidated at group company level with other profits and losses in a tax efficient manner.
- The National Ports Authority returned an EBITDA margin of 73.9% for 2009 and 67% of Transnet Limited profit before tax (Transnet Limited Annual Report 2009). Corporatising the Port Authority and transferring its assets and liabilities to a new state-owned company, as provided for in Chapter 2 of the Ports Act, would require a restructuring of the capital structures in the group and the allocation of debt to subsidiaries.

Hence, notwithstanding the fact that Transnet raises finance from its own balance sheet, without government guarantees, it relies on the revenues generated by its ports sector to finance investment in the rail sector. Therefore, the monopoly pricing of NPA is a necessary condition for Transnet to finance its investment plan across other sectors, particularly rail, as evidenced by the fact that the NPA's EBITDA margin was 73.9% in 2009, accounting for 67% of Transnet Limited's profit before tax.

Critically, if the institutional structure of the NPA were changed as required by the Ports Act, to a corporate one, then it would become liable for more taxation and this would reduce the group's net revenue position. Transnet is therefore raising its funds on an economically and institutionally unsustainable basis. The capital investment programme is, in effect, being subsidised by all port users and their customers, who are paying higher prices for the use of the ports than they would if cargo dues were more competitive.

Relationship between investment in ports and economic growth

Two studies (Perkins *et al.*, 2005; Fedderke *et al.*, 2006) compared infrastructure investment and utilisation over the long term with growth in Gross Domestic Product (GDP), which is relevant to investment in ports (and concomitant financing mechanisms).

The studies found that investment in the ports sector is constrained by the relationship between ports and railways. Figure 20 shows the relationship between the growth in goods handled through all ports and the growth of GDP, between 1910 and 2003. Cargo handled at the ports was used as a proxy for ports investment. Data are expressed in per capita terms to make comparisons sharper.

The graph shows that while ports' throughput and GDP growth moved in fairly close parallel between 1910 and 1930, they diverged thereafter. The rate of growth of ports' throughput only begins to gain on the GDP growth rate during the 1970s when the Richards Bay coal line and Sishen-Saldanha ore line were built thus facilitating major growth in bulk exports.

In the intervening period, which is when the SAR&H was protecting the railways from road competition, growth in goods handled at the

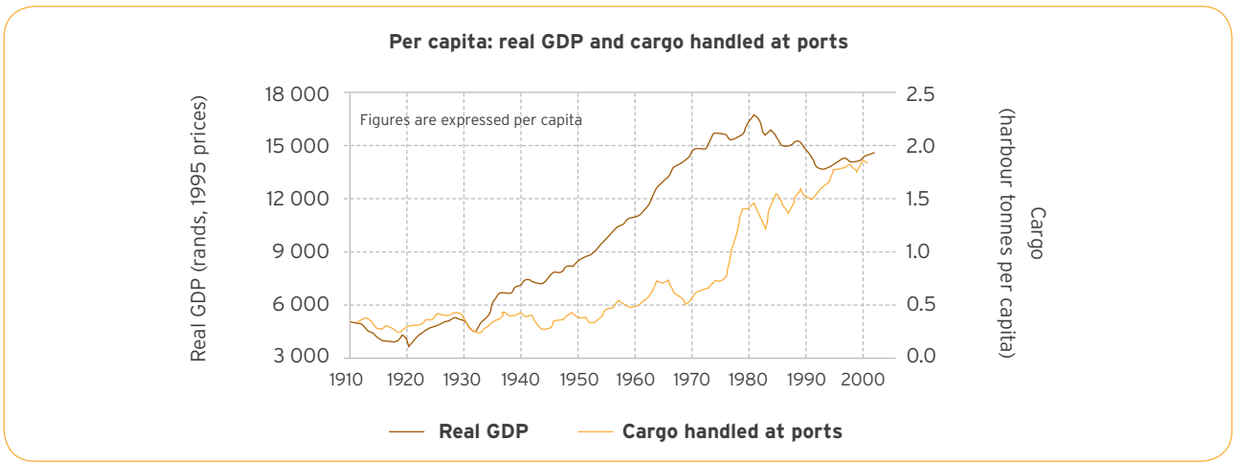


Figure 20: Ports development vs. GDP development, South Africa 1910–2003
Source: Perkins et al. (2005)

ports lagged far behind GDP growth. However, during the 1980s, protection of rail transport weakened and was eventually scrapped. Growth in goods handled at the ports continued to grow strongly from the mid-1980s to the end of the period measured, despite falling GDP. This suggests that the protection of the rail sector may have acted as a constraint to trade growth and, by extension, to ports investment. The increase in road transport which took place once the restrictive rail industry practices ceased, appears to have led to a period of stronger growth in ports' throughput.

Challenges

The ports sector has clear policy guidance and a sound legislative basis for achieving the government's objectives for the sector. The central problem is that a number of important provisions in policy and legislation are not being effectively implemented. As a consequence, Transnet's internal corporate interests prevail over the national interest articulated in ports legislation.

The Ports Regulator is seeking to progressively redress some of the effects of Transnet's dominant position in the ports industry. However, to do this it requires economic resources and institutional strength to pursue and enforce all elements of the Ports Act. More effective implementation of this Act is the central challenge of the ports sector.

More specifically, the challenges in the sector include *inter alia*, the need to:

- revisit Transnet's capital investment plans on the assumption that the ports sector is compliant with the Ports Act, both economically and institutionally;
- identify the extent to which funds raised in the ports sector are being used to cross-subsidise other divisions within Transnet;
- ensure that the NPA manages the concessioning of port services and operations in a manner that is consistent with the Ports Act; and
- confirm whether the current (*de facto*) restriction of certain commodity types to certain ports is in the national interest.

4 Roads infrastructure

Photo: Graeme Williams, MediaClubSouthAfrica.com

In general, the function of the road network is to provide access and mobility to facilitate economic and social linkages and ultimately promote economic development and stimulate exports

This section of the report reviews the roads component of the transport sector, to complete the review of transport infrastructure. It reviews the plans of national and provincial road authorities in South Africa in their historical, institutional and strategic planning context.

Extent and location of road infrastructure

Roads can be classified into different operational systems, functional classes, or geometric types. These classifications are vital for communication among authorities and the general public. Different classification schemes have been applied for various purposes in different regions, and these vary from province to province. Roads are generally 'numbered' or 'designated' as being under the control of a specific road authority. However there remain significant lengths of unnumbered or undesignated roads with no obvious ownership by any road authority.

As illustrated in Table 21, South Africa's total road network consists of approximately 154 000 km of paved roads and 454 000 km of gravel roads, which are proclaimed as national, provincial or municipal roads. Un-proclaimed roads account for 140 000 km, or 33% of the total gravel network of 593 000 km. The un-proclaimed roads are predominantly in rural areas, have not been officially recorded in road inventories, and no authority is responsible for their maintenance and upgrading (SABITA, 2010). The total road network is in the order of 750 000 km in length.

Figure 21 illustrates South Africa's major road network, defined as roads of national significance, as modelled by the NATMAP (National Transport Master Plan) (Department of Transport, 2005b). The major road network includes national roads, as well as the main provincial and metropolitan roads that provide access to land uses of national significance.

The South African National Roads Agency Limited (SANRAL) is responsible for all national roads, comprising 11% of the total paved network. The main function of national roads is to provide mobility to promote economic development and stimulate exports. In recent years, more and more provincial roads have been transferred to SANRAL due to the lack of capacity in, and funding from provincial road authorities. SANRAL's target is to increase its inventory from 16 170 km to 38 000 km by taking over provincial roads of national importance.

Provincial road authorities, which take the form of provincial departments of transport, are responsible for some 31% of the total paved network. These roads primarily provide access and mobility within a region and support a range of economic and social functions via linkages between towns that are not situated on the national road network. Table 22 summarises the extent of roads in South Africa's nine provinces.

While the condition of South Africa's roads has deteriorated due to over-utilisation and under-investment, there does appear to be a stabilisation of the condition of the primary systems as a result of higher investment over the past few years. It is, however, difficult to provide a reliable assessment, as there is limited capacity to assess the condition of South Africa's road network. This gap is currently being addressed by SANRAL, the South African Local Government Association (SALGA) and the DBSA.

Table 21: Extent of the South African road network by authority

Road authority	Paved		Gravel	
	Length (km)	%	Length (km)	%
National roads (SANRAL)	16 170	10.5	0	0.0
Provincial roads	48 176	31.3	136 640	20.3
Metropolitan (9)	51 682	33.6	14 461	2.1
Municipalities	37 691	24.5	302 158	44.8
Total proclaimed roads	153 719		454 000	
Unproclaimed (estimate)	0	0.0	140 000	32.8
Total	**153 719**	**100.0**	**593 259**	**100.0**

Source: Kannemeyer (2011)

Figure 21: South Africa's major road networks

Source: Department of Transport (2010)

Table 22: Extent of the provincial road network by province

Province	Paved (km)	Gravel (km)	Total (km)
	%	%	%
Eastern Cape	11.6	23.9	21.4
Free State	13.4	12.5	12.7
Gauteng	10.2	0.8	2.8
KwaZulu-Natal	15.2	20.3	19.2
Limpopo	6.5	2.4	3.2
Mpumalanga	11.6	5.1	6.5
Northern Cape	11.9	12.4	12.3
North West	5.6	9.4	8.6
Western Cape	13.9	13.2	13.4
Total	**100**	**100**	**100**

Source: Department of Transport (2005)

Evidence of the deterioration in the condition of South Africa's roads is found in the 'Report Cards on South African Infrastructure' prepared by the South African Institute of Civil Engineers (SAICE, 2011), illustrated in Figure 22. Notably, the paved provincial roads, paved district and local municipal roads and all gravel roads are 'At Risk – D Rating' or 'Unfit for Purpose – E-Rating'.

Figure 23 portrays the condition of paved national and provincial roads by authority in 2009. Figure 24 shows the condition of provincial gravel roads. The KwaZulu-Natal province performed the worst, with over 40% of roads in poor to very poor condition, followed by Mpumalanga (35%) and North West (30%). The best performing provinces are the Free State and Limpopo, with less than 10% of their roads in poor or very poor condition. Less than 10% of national roads are in a poor to very poor condition.

Roads	
B for national roads	The national road network is in the good to excellent range with the proportion of roads in poor to very poor condition never exceeding the international benchmark of 1096. SANRAL demonstrates expert knowledge, world-class management and excellent monitoring and maintenance systems. Close to 80% of the network has exceeded its 20-year structural design lifespan. SANRAL's current success in maintaining the national road network will see its responsibilities and network allocation expand further. These will be severe challenges.
D- for paved provincial roads	The paved provincial road network has deteriorated significantly over time. Shortages of skilled personnel in provincial departments, inadequate funding and outdated systems, and the lack of routine and periodic maintenance, have contributed to the current condition.
C- for paved metropolitan roads	Generally, these roads are in a satisfactory condition. Less than 10% (except for Buffalo City) of the paved metropolitan roads are in a poor to very poor condition. Balancing the need for the upgrading of township roads with the necessity to perform routine and periodic maintenance remains a challenge given the limited resources at their disposal. Concerns about the lack of capital expenditure on capacity improvements and signalling upgrades.
D for paved district and local municipal roads	In general, municipalities lack capacity, skilled resources and funding to efficiently and effectively manage their road networks. Reliable condition data is scarce. Few municipalities make use of pavement management systems to prioritise their needs. Capacity improvements amount to much less than that required, especially with high urbanisation rates. Based on the limited data available, the paved road network on average, nevertheless appears to be in a fair condition.
E for all provincial, metropolitan and municipal gravel roads	Maintenance of gravel roads, which constitutes 75% of the total length of the proclaimed South African road network, has been neglected. Condition data is scarce (only available for 24% of the network). Approximately 50% of the provincial gravel roads and 30% of the minicipal gravel roads, for which condition data is available, are in a poor to very poor condition.

Figure 22: Report card on South African road infrastructure
Source: SAICE (2011)

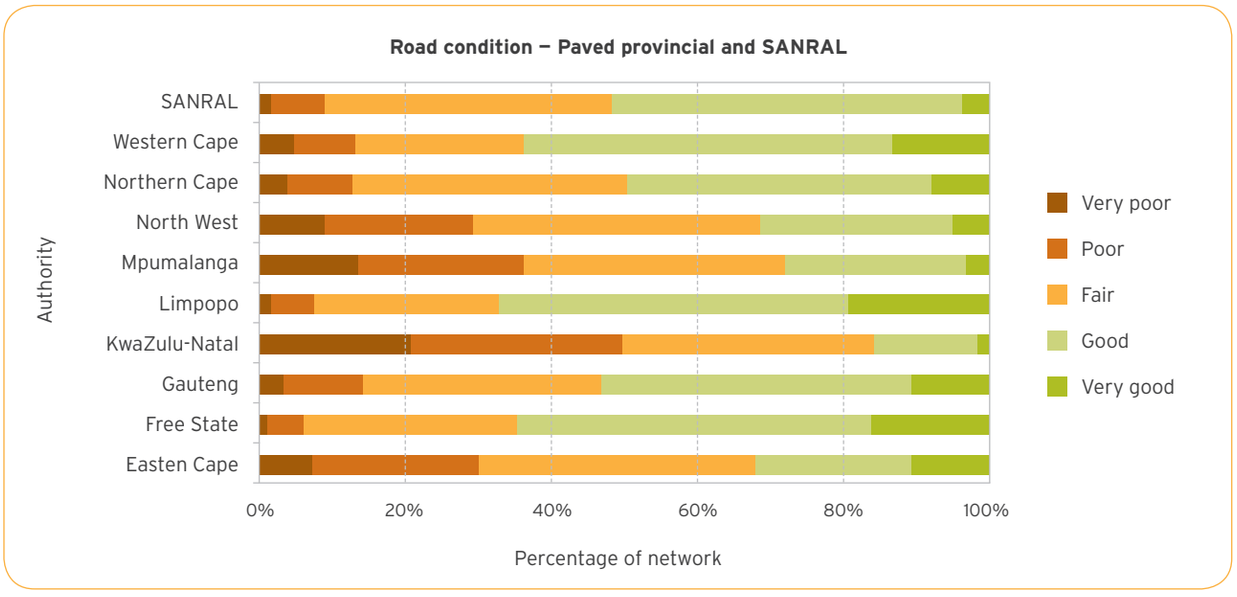


Figure 23: Visual condition of paved national and provincial roads by authority as well as provincial gravel road network (SANRAL, 2009)
Source: SABITA (2010)

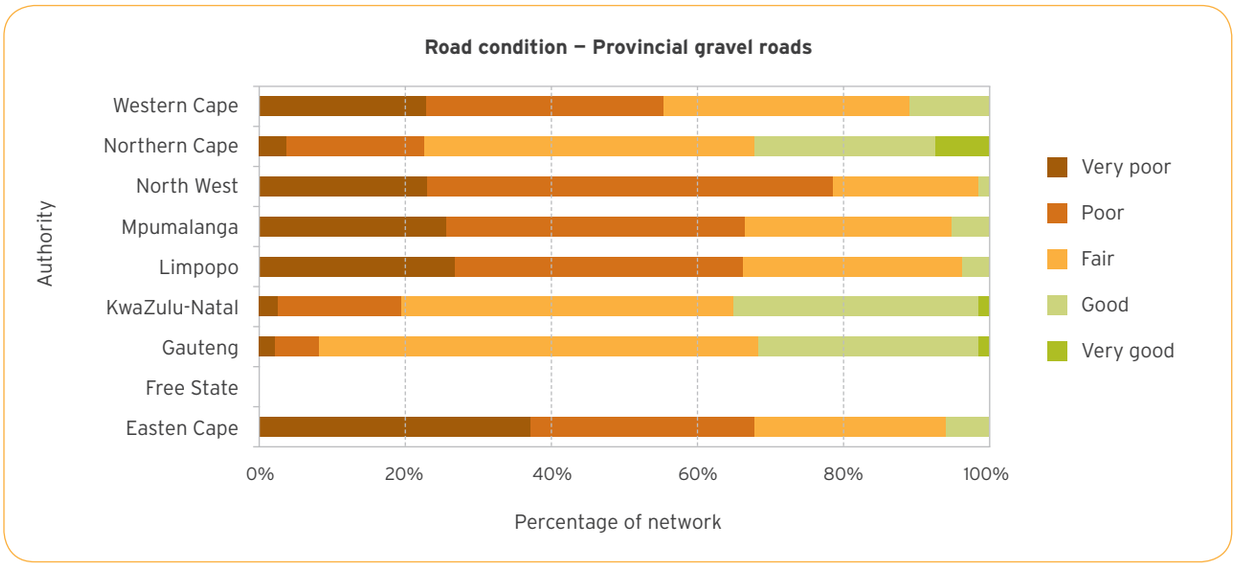


Figure 24: Road condition – Provincial gravel roads

Source: SABITA (2010)

There are three major consequences of the deterioration of the road network (Automobile Association, 2000):

- The cost to repair the roads is said to be seven times more than it would have been if adequate maintenance had been done;
- The backlog in funding grew to R65 billion in 1999; and
- Road user costs are twice as high on a road in poor condition as compared to a road in good condition.

It is a cause for concern that in a context of substantial growth in allocations to provincial transport authorities, deterioration of the road networks is ongoing. In particular, the Northern Cape, North West, Gauteng and Western Cape provinces were unable to stem the ongoing deterioration of their networks, despite substantial increases in funding (averaging 17% a year in the past five years). The extent of the deterioration of provincial roads is illustrated in Figure 25.

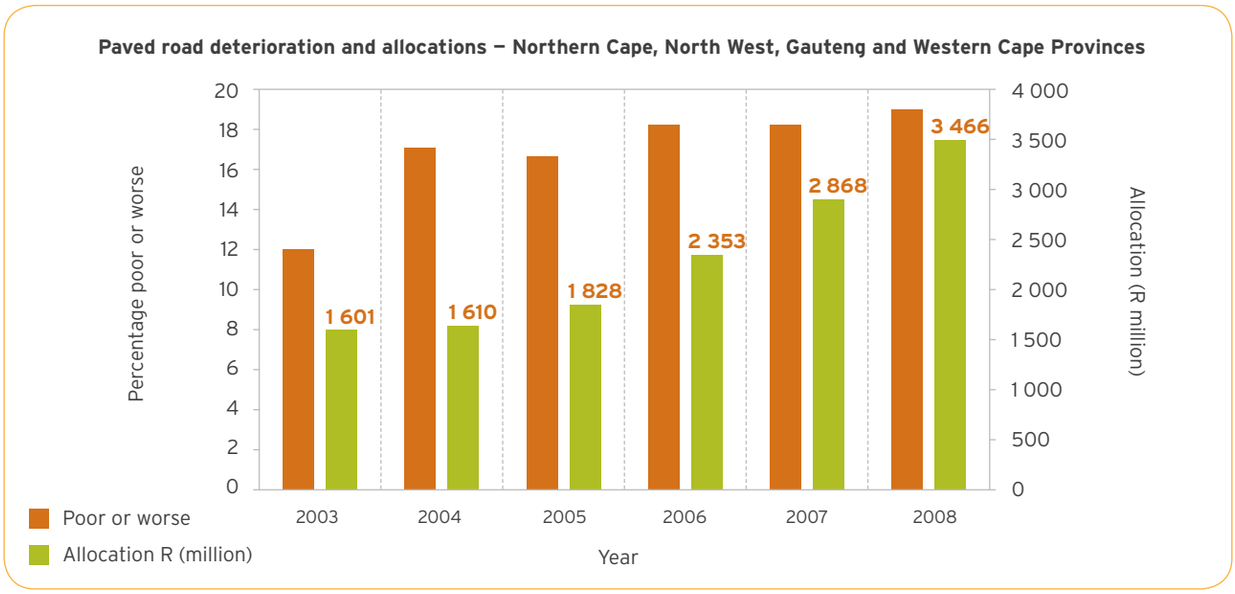


Figure 25: Paved road condition and funding allocation in selected provinces

Source: SABITA (2010)

For gravel roads in the provinces, the situation is even worse. Approximately 50% of the 136 640 km of the provincial gravel road network is in poor to very poor condition. This suggests that provinces do not have the capability or resources to manage their gravel networks adequately.

Historical under-investment in South Africa's road network is evidenced by the fact that some 78% of the national road network is older than the original twenty-year design life, as illustrated in Figure 26. This is an important indicator of increasing rehabilitation needs. However, despite the poor and deteriorating condition of South Africa's roads, it is worth noting that they still measure up favourably when compared to others in Africa.

The major challenge confronting South Africa's road network is that there is a huge backlog in road maintenance and rehabilitation. Figure 27 provides a spatial perspective of the backlogs in terms of the Visual Condition Index. Notably, the map underestimates the poor condition of South Africa's roads, because it only portrays the condition of the major road network, which is better maintained than the rest of the paved network and gravel roads.

Historical perspective

During the period of colonisation, a number of trading posts and harbour towns were established by the Dutch and the British (1652–1854). Major political events led to the migration of residents away from Cape Town (and environs) to the hinterland: for example the Great Trek (1834 and 1850). Over time this led to the establishment of roads and later railway lines connecting the hinterland settlements and the coastal towns. Many of the current national routes evolved from historically established routes linking the Cape and Natal colonies to the hinterland.

The discovery of diamonds in Kimberley and gold in Johannesburg from 1860 onwards, were key drivers for expanding the transport network. Equipment and supplies to support the mining sector were transported by means of ox wagons on gravel roads to Kimberley and Johannesburg. Later, rail dominated after railway lines from Cape Town to Kimberley and from Cape Town to Johannesburg were completed in 1875 and 1892 respectively.

During the segregationist/apartheid period (1910-1994), motorised public transport was entrenched technologically, institutionally and commercially, and captured the major portion of the public transport market. Buses and metropolitan rail systems gradually took over from trolley buses, which were phased out in the late 1960s.

Starting from a low base in the early 1900s, private car travel grew exponentially as the road network was gradually expanded and improved. During this period, cars and trucks started to compete in both passenger and freight transport markets hitherto serviced by rail. The introduction of toll roads during the 1980s allowed for further expansion of the road network, as summarised in Table 23.

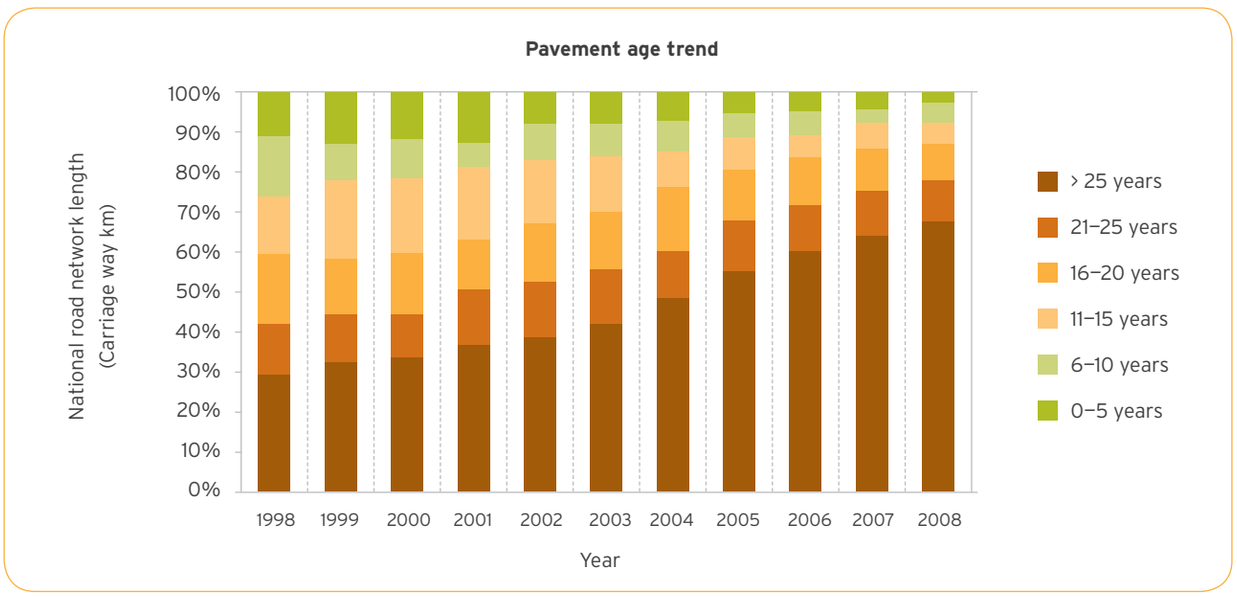


Figure 26: Age trend of the SANRAL road network[8]
Source: SANRAL (2009)

8 'Pavement age' refers to the top 300mm of road structure

Figure 27: Visual condition of major road networks of South Africa

Source: Department of Transport (2010)

Table 23: Expansion of the road network

Year	Total network (km)	Paved network (km)
National and provincial roads		
1935	120 000	
1936	NRB commenced paving national roads	
1948	136 000	5 840
1973	185 000	38 500
2007	202 600	202 600
Local roads		
1973	40 000	16 000
2007	250 000	Majority

Source: Department of Transport (2010)

The vehicle population increased rapidly as the road network expanded. Growth in per capita income was a significant contributing factor to growth in car ownership and use.

South Africa's transition to democracy was accompanied by a decisive shift in road policy with the publication of the White Paper on Transport Policy (1996). The prioritisation of rural transport in support of the country's rural development imperative was a central feature of the new policy. To that end, various road projects have been implemented to improve road capacity in rural areas and to enhance traffic safety on the roads linking urban and rural areas. The national road network was also further extended by introducing more state toll roads and by means of concessions to private investors.

Operational issues in the roads sector

After a comprehensive analysis of the operational problems in the road sector, the DOT (2010:1–11) identified the following challenges:

- Many provincial roads are in a very poor condition and are deteriorating exponentially, whilst capacity in some areas becomes limited and is unable to satisfactorily accommodate demand;
- Planning of rural access roads that ensure proper linkages to provincial and district roads which provide effective access to low density dispersed settlements has been poor, as rural roads have not been recognised as an integral element of the provincial road network and therefore are allocated little funding;
- The shift away from rail freight onto road is placing significant pressure on the road network and is resulting in the deterioration of road pavement structures;
- The growth in both private and freight road transport is resulting in traffic congestion within major urban areas; and
- Road safety is poor.

While South Africa has a well-developed road network, traffic congestion is a problem both on commuter routes in and around urban areas, and on major national routes during peak holiday periods. Road is also the dominant mode for freight transport as evidenced by the findings of a 2011 Supply Chain Foresight survey (Barlow World Logistics, 2011) amongst 300 top industry executives in South Africa. The survey found that 78% of companies move less than 10% of their freight by rail, while only 4% of companies move over 50% by rail. As argued in Chapter 2, the allocation of investment across road and rail will play a critical role in enhancing the efficacy of South Africa's transport networks, which in turn will have a significant impact on the future economic growth trajectory.

One consequence of growing freight volumes on the roads is that the overloading of freight trucks is causing not only rapid deterioration in road conditions, but also diminishes road capacity and safety. In this regard, the following problems have been identified:

- A lack of trained staff;
- Limited hours of operation of weighbridges resulting in early morning and late evening violations;
- Lack of escape roads and alternative routes;
- Poor geographic coverage of weighbridges and permanent overloading of control facilities;
- Poor enforcement and inadequate legal support for the overloading enforcement system;
- Possibility of corruption; and
- The profitability of overloading.

To address these challenges, the DOT, together with the Road Freight Association, has implemented a Road Transport Management System (RTMS), which is an industry-led, voluntary self-regulation scheme that encourages consignees, consignors and road transporters to implement a management system that preserves road infrastructure, improves road safety and increases productivity. The system's key components are load optimisation, driver wellness, vehicle maintenance and productivity.

This initiative should be closely monitored as it holds the promise of addressing the freight overloading problem. It could result in substantially reducing road damage and thus potentially decreasing maintenance investment required, as well as improving general road safety.

South Africa has one of the worst road safety records in the world – the road accident fatality ratio is more than double that of any developed nation in the world. Approximately 14 000 deaths are incurred due to approximately a million accidents per annum. In 2005 alone, this road carnage cost the South African economy in the order of R43 billion.

Analyses have revealed that heavy vehicles play a central role in compromising road safety. Firstly, the size and slow speed of heavy vehicles impedes traffic flow, provoking hazardous driving on the part of other drivers. Secondly, the weight of overloaded vehicles rapidly destroys road pavements thus creating physically unsafe conditions for all road users. Consequently, areas of high heavy vehicle traffic should be prioritised from a safety perspective.

Value of road assets

The value of South Africa's total road network is R1.971 trillion, of which R1.165 trillion is attributed to the paved road network. Table 24 provides an estimate of the road length per authority, replacement cost per km, and replacement value. The replacement cost for SANRAL is based on actual detailed calculations per kilometre of road, taking into consideration traffic, climate, terrain, etc. The replacement cost for other levels is based on the best estimated average rate applicable throughout South Africa.

Table 24: South Africa's asset value of road network and replacement value

Network length summary (km)				Replacement cost per km (Rand)		Replacement value (R billion)		
Authority	Paved	Gravel	Total	Paved	Gravel	Paved	Gravel	Total
SANRAL	16 170	-	16 170	15 489 652	-	250.47	-	250.47
Provinces – 9	48 176	136 640	184 816	9 675 938	1 500 000	466.19	204.96	671.11
Metros – 9	51 682	14 461	66 143	5 611 130	1 500 000	289.99	21.69	311.69
Municipalities	37 691	302 158	339 849	4 208 391	1 500 000	153.72	453.26	606.98
Total	158 618	453 237	611 855					
Unproclaimed (est.)		140 000	140 000		900 000		126.00	126.00
Estimated Total	**153 719**	**593 259**	**746 978**			**1 165.23**	**805.89**	**1 971.12**

Source: Adapted from NRSAAL Annual Budget (2010) and National Treasury MTEF Estimates (2010)[9]

As a benchmark, the theoretical depreciated value of the network, based on international best practice on the minimum acceptable road condition, is calculated as R1.379 trillion and the expected deterioration value would be R591.3 billion. It may thus be inferred that the additional (accelerated) depreciation (loss of value through deterioration) as a result of poor maintenance on the network is in the order of R204 billion or 10% of the current asset value.

The value of road infrastructure extends well beyond its replacement value. The expansion and maintenance of road infrastructure is pivotal to socio-economic development. There are five spheres of economic activity where road infrastructure supports improving efficiencies:

- Distribution and the structure of employment – the geographic distribution of remunerative jobs is both directly and indirectly associated with the transportation system;
- Distribution of personal income – the share of total output and income accruing to different sectors of the population;
- Distribution of regional output and income – the share of production and economic output generated by different geographic regions;
- Distribution of sectoral output and income – the share of total production and output attributable to particular economic sectors; and
- Growth in economic output – increased total production valued at market prices, both at a national and regional level.

In a context of high and growing inequality, it is important to appreciate the role of road infrastructure in redressing economic exclusion and marginalisation. Rural poverty, in particular, has been linked to the isolation of rural communities from economic centres. Improving access to road transport would open up opportunities for non-farm employment and improved utilisation of social services. Consequently, improved roads should be considered as elements of a social development programme.

Future investment in South Africa's road network must take cognisance of the following issues:

- Maintenance of existing infrastructure is as important, if not more important than development of new roads.
- Improving the operating efficiency of existing infrastructure is vital for it to have an optimum economic impact.
- SANRAL's economic appraisals indicate that state support is necessary to facilitate higher levels of investment in roads.
- Performance of entities responsible for procurement and maintenance has varied across provinces and requires strengthening.
- Local authority transport infrastructure procurement agencies are typically under-funded.

9 Notes: 1. Replacement costs for SANRAL are based on actual detailed calculations per km of road, taking into consideration traffic, climate, terrain, etc. 2. Replacement cost for other levels are based on best estimated average rate that will be applicable throughout South Africa.

New investment projects in the roads sector

Table 25 illustrates expenditure on roads between 2003 and 2010, as well as planned expenditure by transport authorities for the 2011–2013 MTEF period. The data shows that in real terms, expenditure has increased since 2003, peaking in 2009. Expenditure is, however, projected to decline mainly as a result of reduced expenditure by SANRAL following the completion of the Gauteng Freeway Improvement Project (GFIP).

Phase four of the National Transport Master Plan (NATMAP) developed an Action Agenda, including an investment programme with cost estimates for short, medium, and long-term projects for each transport infrastructure component. The Department of Transport intends to ensure that all Road Authorities conduct their future planning within the framework of NATMAP, which will be updated every five years. To that end, a process of drafting a legal framework to facilitate the development of a NATMAP Implementation Bill, and subsequently a NATMAP Act is currently under way.

The NATMAP 2050 blueprint for the future transport system prioritises the following issues:

- A major shift from road to rail transport is envisaged for both passenger and freight traffic.
- In terms of freight traffic, a number of measures will be introduced to support this modal shift. These include economic and technical regulations for selected commodities. The focus is on traffic that causes the most damage to roads and would be more appropriate for rail transport.
- In terms of passenger transport and private car use, a priority focus is to promote public transport by getting people out of their cars and into public transport modes, with an emphasis on mass modes, higher capacity and more energy efficient vehicles with lower carbon emissions.
- Create a 'wall-to-wall' service delivery network for passenger transport with a fair and equitable service in place for all communities so that a situation where there is no choice other than mini-bus taxis for the poorest communities can be avoided. There needs to be a balance between efficiency (particularly high volume roads) and equity (access for poor communities).
- Adequate rail transport network and airport capacity will ensure that road transportation is not the only choice available for freight transport.
- Acceptable and efficient alternative transport networks and systems will bring about a better modal balance.
- Road network enhancements should focus on capacity and quality improvements, rather than adding to the network. Traffic Demand Management and high pricing strategies for road use will be introduced as part of the strategy to shift passengers and freight from road to rail.

Table 25: Historic and future expenditure on roads by SANRAL and provinces (R million)

Year ending	03	04	05	06	07	08	09	10	11	12	13
	Expenditure								MTEF Estimates		
North West	316	437	393	605	689	677	728	948	1 071	1 172	1 189
Northern Cape	128	127	187	176	236	365	432	449	574	632	683
Eastern Cape	1 314	1 431	1 282	1 369	1 492	1 615	1 915	1 713	1 664	1 777	1 899
KwaZulu-Natal	838	1 180	1 384	1 682	1 856	2 360	4 122	3 530	3 700	4 099	4 355
Limpopo Province	659	829	952	1 152	1 139	1 442	1 426	1 487	1 561	1 916	1 976
Western Cape	598	527	653	962	1 285	1 345	1 393	2 155	1 627	1 682	1 769
Gauteng	559	519	595	610	658	1 079	1 447	1 735	1 534	1 715	1 766
Mpumalanga	479	450	607	723	688	993	1 124	1 035	1 243	1 437	1 444
Free State	366	292	321	333	801	740	994	888	1 079	1 157	1 197
Total Provincial	**5 257**	**5 792**	**6 374**	**7 612**	**8 844**	**10 616**	**13 581**	**13 940**	**14 053**	**15 587**	**16 278**
Growth rates yr/yr %	34.7	10.2	10.0	19.4	16.2	20.0	27.9	2.6	0.8	10.9	4.4
SANRAL	**1 203**	**1 291**	**1 441**	**1 753**	**3 286**	**6 119**	**13 893**	**19 225**	**17 362**	**12 539**	**12 441**
Growth rates yr/yr %	12.7	7.3	11.6	21.7	87.5	86.2	127.0	38.4	-9.7	-27.8	-0.8
Total Provincial and National (R million nominal)	**6 460**	**7 083**	**7 815**	**9 365**	**12 130**	**16 735**	**27 474**	**33 165**	**31 415**	**28 126**	**28 719**
Yr/yr change (5) %	29.98	9.64	10.33	19.83	29.52	37.96	64.17	20.71	-5.28	-10.47	2.11
CPI (in Year end -1) %	72.1	76.3	77.4	80.0	83.7	89.7	100.0				
Total (Rm 2008)	**8 960**	**9 283**	**10 097**	**11 706**	**14 492**	**18 657**	**27 474**				
Yr/yr change (% 2008)	19.16	3.61	8.77	15.94	23.80	28.74	47.26				

Source: SANRAL (2009)

The projects envisaged within these timeframes and strategies foresee a much higher investment in rail compared to roads, respectively 43% (R326 billion) and 27% (R202 billion) of the total investment in transport over the 2010 to 2050 period. It should be noted that NATMAP focuses more on upgrading geometric capacity[10] than on road pavement rehabilitation. In contrast, the highest proportion of the MTEF allocation for roads is for road maintenance and rehabilitation.

As set out in Chapter 2 on rail infrastructure, the issue of prioritising investment in either road or rail as the basis for developing the future freight and passenger transport networks needs to be carefully considered. There is a real danger of over-investment in rail, at the expense of economic development, should it not be made clearer where roads are to be prioritised against where rail is more appropriate.

Rail is able to support only specific types of economic activity and hence there is a real risk of inhibiting economic growth. Historically, there has been under-investment in the road sector as passenger volumes grew and as a consequence of the deregulation of road freight in 1988, alongside poor regulation, specifically in relation to overloading. However, seeing rail as a panacea for freight and passengers should be critically evaluated within the framework of South Africa's future growth path.

Policy, legislation and regulation

There is a bewildering array of acts and regulations governing both road infrastructure and transport services. They range from the Constitution (which identifies roads as a concurrent function of the three spheres of government), to national legislation, provincial road ordinances (some of which emanate from the apartheid period and need urgent updating), and a plethora of legislation governing municipalities.

Within this framework, there are substantial gaps which require urgent attention:

- In some provinces there are portions of the road network that remain unproclaimed: they fall under neither provincial nor municipal authorities. This issue clearly requires urgent resolution so that provincial and municipal roads are clearly defined, and the concomitant responsibilities for planning, investment and maintenance are clearly allocated.
- SANRAL, provinces and municipalities do not have access to dedicated funding for roads, relying on transfers from the fiscus.
- The National Land Transport Act 5 of 2009 (NLTA) (Government of RSA 2009), promulgated in the Government Gazette on 8 April 2009, is not yet in operation, except for the provisions which came into operation on 31 August 2009 dealing with the roles of the three spheres of government and contracting for public transport services.
- The Local Government Municipal Finance Management Act (MFMA) (Government of RSA 2003) does not address taxes, levies and user charges for the provision of municipal services.
- With the exception of Gauteng and KwaZulu-Natal, the legislation governing roads in the remaining seven provinces was developed during the apartheid era. While most of these provinces have developed new transport legislation, it remains unpromulgated.

Notwithstanding the policy issues addressed earlier in this section, the following hindrances need to be highlighted to emphasise their role in compromising road infrastructure delivery:

- Lack of capacity of provincial and municipal road authorities to perform legislative functions;
- Lack of effective coordination between national, provincial and municipal authorities in terms of planning and operations;
- Unclear relationship between national and provincial toll roads, and possibly future municipal toll roads, suggesting that there may be a need for a national toll road policy;
- No clear distinction between provincial and municipal roads;
- Lack of clearly demarcated functions between the various road authorities; and
- Inadequate road traffic law enforcement, especially for road-user violations.

Finance for road infrastructure

South Africa's road network was historically built and maintained by finance collected from a dedicated levy on fuel sales. The dedicated use of this levy for roads was, however, abolished in 1988. Since then road construction and maintenance has relied on an annual grant from central government. For eleven years, this grant decreased steadily, but over recent years has increased to being one of the fastest growing in the national budget. Moreover, the allocation to transport and roads, in particular, exceeds what is collected through the fuel levy. It is estimated that currently less than half of the amount required annually for maintenance of the network is provided by government. This has had severe consequences for the quality of the road network. Even if the level of budget allocated to roads were to be substantially increased, the funding gap will continue to widen as a result of inadequate maintenance over the past decade. It also needs to be noted that although the argument that the fuel levy should be used to cover all the costs of the road network is very popular, the levy would in reality have to at least double in size.

10 Upgrading geometric capacity permits more vehicles and better safety at a higher operational speed such as is seen on the recently completed Gauteng Freeway Investment Project (GFIP). Road pavement rehabilitation, on the other hand, focuses on repairing road pavement without enhancing geometric capacity; provincial road rehabilitation programmes are following this strategy.

One response to this pressure has been the development of toll roads, based on the principle of user charges. The current toll road network comprises about 19% (3120 km) of the current national road grid. Some 1832 km of these toll roads are managed by SANRAL and 1288 km of the tolled sections of the national road have been concessioned to private companies to develop, operate and maintain. In its endeavour to continue with the expansion and maintenance of the comprehensive national road network, SANRAL will continue with the selective expansion of the toll road network. There are, however, limitations to the viability of toll roads: less than 5% of the rural paved road network is amenable to tolling.

In some cases, concessioning to the private sector (for example, *inter alia* through Public Private Partnerships, including Build Operate and Transfer arrangements) can be an effective means of expanding current infrastructure facilities owned by government. In this scenario, private investors and operators upgrade and operate specified facilities for a defined period of time, within a framework allowing them to recover their investment and other costs. However, it is critical that risk allocation is equitably allocated between the parties and that government is not left carrying a higher risk burden.

It is anticipated that road infrastructure (construction, rehabilitation and maintenance) will continue to be funded by the public sector including public agencies and entities. The total public sector transport investment estimate for the 2011/12 to 2013/14 MTEF is R212 billion, accounting for 31% of the total MTEF across all sectors. This is the second highest estimate after energy at 35%. In addition, the Provincial Road Maintenance Grant (PRMG) was created in response to maintenance shortfalls of the provincial road network. Its budget allocation is R6.457 billion in 2011/12; increasing to R8.259 billion in 2013/14. These funds, previously allocated to the Expanded Public Works Programme (EPWP), are being ring-fenced for road maintenance.

Furthermore, the S'hamba Sonke Programme (Moving Together: Accelerating Rural Development Through Access and Mobility) is a new initiative by the Department of Transport to address the ongoing deterioration of South Africa's secondary (provincial) road networks. This project involves a road construction and maintenance methodology that is both labour extensive and meets the criteria of the Integrated Transport Sector Code and the Construction Sector Code (Department of Transport, 2011).The intention is to create a three year pilot programme with provinces in order to:

- benchmark value for money in road construction and maintenance budgets;
- oversee the introduction of uniform best practice methodologies; and
- create new jobs and opportunities where people live.

This programme is pivotal to the improvement of rural roads. It should be closely monitored and taken to scale at the earliest opportunity. Critically, it has the potential not only to improve the condition of rural roads and expand the rural road network (thereby enhancing labour mobility), but also to create direct employment in areas with very high levels of poverty and unemployment.

Given the backlog and need to provide adequate maintenance in future, the question is what budget is required to eliminate the backlog and sustain maintenance? The maintenance budget assumed that the pavement strengthening would be addressed over five years and the gravelling over 10 years. The 2010/11 budget allocation varies between 28% and 55% compared to the yearly budget required, yielding an overall proportion of 40%. Road authorities will therefore have to be careful to balance their own funding allocation between different road needs. With a 60% shortfall in required annual budget, it would take 10 to 15 years to fully eliminate the backlog, provided that current funding levels are maintained. Additional funding sources amounting to R99 billion are therefore urgently needed, and roads authorities would need to think of innovative ways of raising this and reducing deterioration and minimising the impacts of utilisation.

Challenges

The challenges currently confronting the roads sector are not limited to a lack of funding. They are immense and complex. Despite increased funding for roads, resources allocated to roads infrastructure remain inadequate for eliminating the huge backlogs in maintenance over the next five to ten years – the backlogs are compounded by, and the result of increased utilisation.

During the last few decades there have been repeated road needs studies, calls by the road industry for a dedicated road fund, and negotiations at various fora. As regards institutional factors, the challenges are so widespread and of such magnitude that it would take a concerted and coordinated effort by all stakeholders to implement effective solutions. Even if this level of cooperation is attained, it would take decades to reach a satisfactory state of road infrastructure. Monitoring the extent and severity of the problems and the impact of current measures is critical if the challenges in the roads sector are to be resolved.

The priorities for crucial interventions are as follows in no specific order:

- *Skills:* Road authorities at all levels require well-placed technical skills to ensure adequate planning and decision-making capacity to facilitate the preservation and expansion of the roads network.
- *Funding:* Sustainable road funding is required to ensure that road maintenance and capital investment into the road sector are achieved.
- *Asset management systems:* Appropriately designed paved road management systems and gravel road management systems are required for each road authority to ensure adequate and timeous decision making.
- *Operations:* Effective and coordinated actions are required to ensure the efficient utilisation of the existing road infrastructure and to address road safety, control overloading, and manage travel demand.
- *Integrated planning:* The DOT's efforts to integrate planning between roads, transportation and traffic functions as well as between transport and other sectors such as Land

Affairs, Public Works, Human Settlements, Health, Education, Economic development, Mining and Agriculture should be continued and intensified. All sectors need good transport and roads; integrated, proactive planning will provide funding motivation from other sectors, and reduce pressure on roads by reducing the need for travel and by optimising the role of public passenger transport and rail freight transport.

- *Political will:* A determined focused effort is required to coordinate and ensure the success of the various efforts to maintain an economical road network.

5 Electricity sector infrastructure

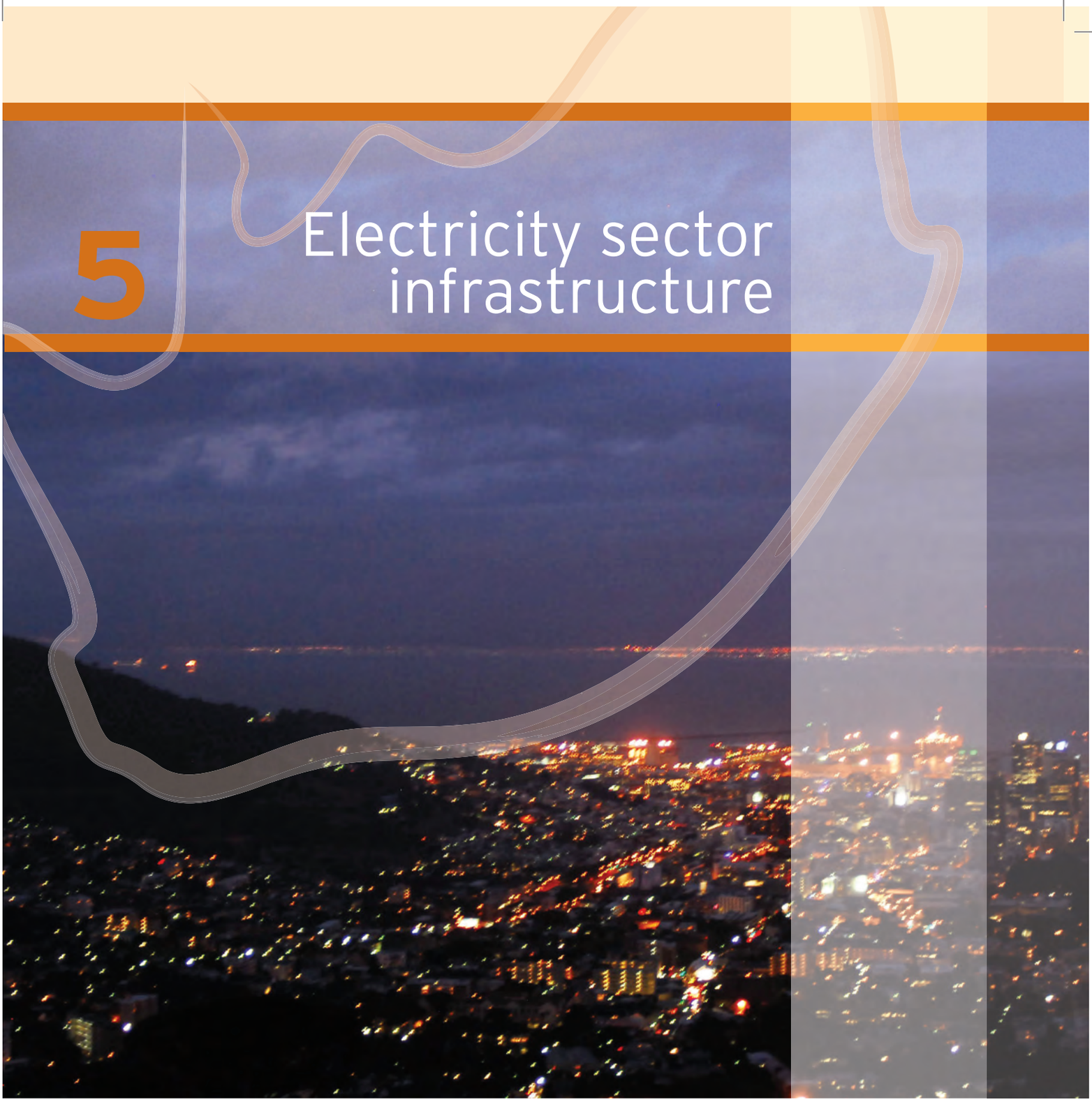


Photo: Jeffrey Barbee, MediaClubSouthAfrica.com

The key challenge for electricity generation, transmission and distribution in South Africa is ageing infrastructure

The electricity sector in South Africa is dominated by the national utility Eskom, which owns and operates most of the national electricity generation infrastructure and supplies 95% of the country's electricity requirements. The balance is supplied by municipalities and redistributors (4%), as well as private generators (1%). Electricity infrastructure comprises three sub-sectors: generation, transmission and distribution.

In terms of generation, Eskom dominates the production of electricity, with a generation infrastructure comprising thirteen coal-fired power stations, as illustrated in Figure 28. These power stations (34 952 MW) account for 85% of Eskom's total net maximum capacity (41 194 MW, an increase from 37 764 MW in 2007). Most power stations are located in Mpumalanga, except for Lethabo and Matimba which are located in the Free State and Limpopo respectively.

South Africa has, since 2007, faced electricity supply challenges. Inadequate generation capacity is exacerbated by the fact that some power stations are approaching the end of their lifespan, resulting in substantial operational inefficiencies. Other challenges include the availability of coal supplies to power stations, as coal exports are financially attractive to the local coal mining industry.

There are also private companies that own and operate projects that generate power to meet their own needs and/or to sell to the national electricity grid. While this source of generation capacity reduces the need for Eskom-generated capacity, it is very small in relation to the base load generated by Eskom.

Eskom owns and operates the national transmission system. In 2011 Eskom had more than 300 000 km of power lines, of which 28 790 km constitute the national transmission grid. The installed transmission

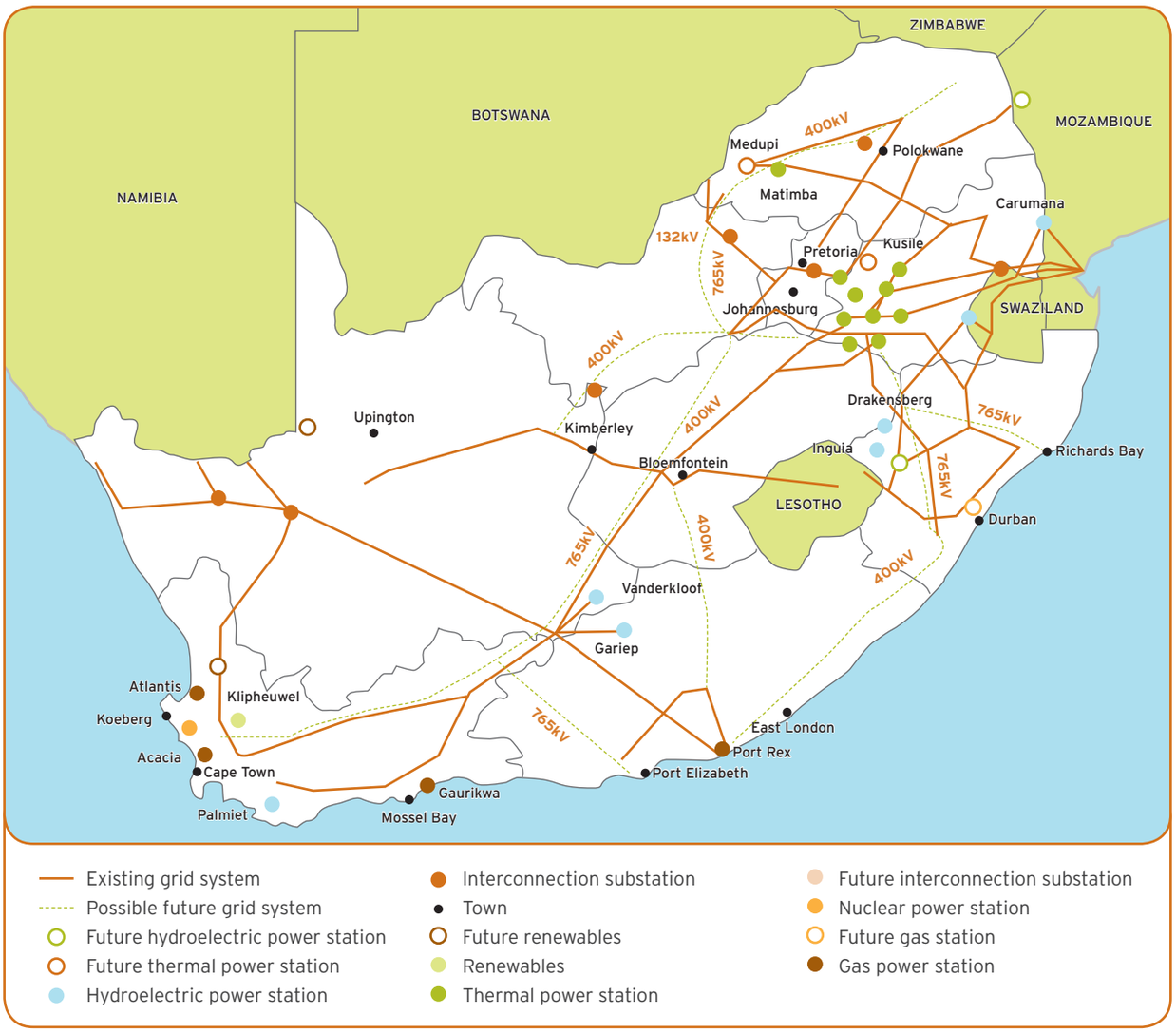


Figure 28: South Africa's electricity infrastructure network

Source: Eskom (2011: 5)

transformer capacity has increased from 118 630 MVA in 2007 to 130 005 MVA in 2011. A challenge facing electricity transmission is the theft of steel structures, which contributes to network failure. Access to land for rolling out more transmission infrastructure is also becoming a challenge.

Given that South Africa is facing electricity supply constraints, generation capacity locally or in neighbouring countries needs to be augmented to strengthen security of supply. This, however, requires investment in the necessary transmission infrastructure and improved regulation.

As regards electricity distribution infrastructure, Eskom retails approximately 60% of electricity sales in South Africa to 40% of national consumers. Approximately 184 licenced municipalities as well as a small number of private distributors sell the rest of the electricity to the remaining 60% of national consumers. The bulk of electricity distribution customers are in the residential sector.

The distribution industry has an asset base of R261 billion. Eskom and the 187 municipalities responsible for the distribution of electricity to approximately nine million customers employ 31 000 people. The operation of distribution facilities varies between regions and municipalities. Networks in many municipalities are believed to be in a poor state, with substantial investment required to maintain and rehabilitate assets.

The cabinet decided in December 2010 to discontinue the process of restructuring the Electricity Distribution Industry (EDI) through the establishment of Regional Electricity Distributors (REDs). Consequently, EDI Holdings was dismantled on 31 March 2011. The dismantling of REDs has meant that municipalities retain their constitutional mandate for distribution, yet face the challenge of financing electricity distribution backlogs. This situation is made worse by neglected maintenance. The estimated cost of the necessary refurbishment amounted to R27.4 billion by 2010 and has been growing by some R2.5 billion annually. The period of uncertainty over the introduction of the REDs unfortunately exacerbated the neglect of infrastructure. The Department of Energy is currently reviewing the entire electricity value chain in order to develop a holistic approach towards energy security.

One of the biggest challenges in the distribution sector is the need to achieve universal access to electricity, through the national electrification programme. This is recognised as a social infrastructure programme that requires subsidisation. The intention is to accelerate this programme, with a target date of 2012 for 100% access to electricity by households, schools and clinics. The level of electrification in South Africa currently stands at 73% (3.4 million households remain without electricity).

Operational issues in the electricity sector

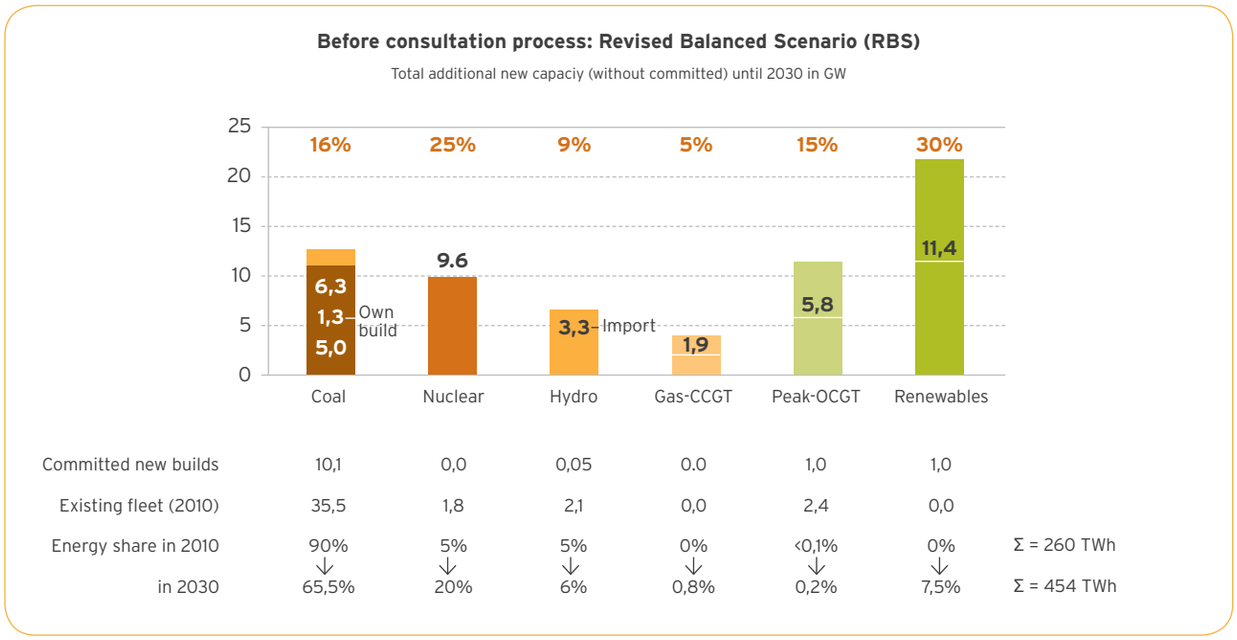
The South African electricity generation sector is dominated by coal-fired power stations. Consequently, there are concerns about both the environmental impact of coal use in power generation, and increasing competition for coal resources between the local coal generation sector and export markets (which creates the risk of future increases in coal prices). The South African government's strategy is to diversify the energy mix for new generation capacity.

The Integrated Resource Plan (IRP 2010) includes plans for new coal-fired power stations to be built by Eskom as well as independent power producers (including imports); and to incorporate proven technologies that reduce water requirements and environmental impacts. New power generation capacity of 6250 MW (14.7%) will be added to the country's coal-fired power plants by 2030, as illustrated in Figure 29. This new capacity will augment Eskom's existing programmes to expand coal-fired electricity capacity (Medupi, Kusile and old power stations being returned to service).

The key drivers of continued coal-based power use in South Africa (in spite of the environmental concerns) is the abundance (locally and in the southern African region) and the relatively low direct cost of the resource. The most important reason, however, is the performance of coal-fired power stations in terms of availability and reliable output. They operate at base-load capacity, which is available continuously (for twenty-four hours) except during maintenance and technical outages, thus increasing the security of supply. While this view is not uncontested, the only other technologies that can achieve the same performance are nuclear reactors and big hydro power schemes. South Africa lacks the water resources for the latter and intends to implement the former with due regard to emerging concerns about the safety of nuclear power generation.

For South Africa, the pursuit of renewable energy looms large in the electricity sector because of its contribution to the mitigation of environmental challenges. Security of supply, however, remains a concern in relation to the use of such technologies. Renewable energy capacity is variable due to the use of weather-dependent solar and wind resources. Without due mitigation such as smart grid technology and pumped storage facilities, such variability can negatively impact the security of the national electricity generation system as well as grid stability.

The IRP 2010 sets a target of 10% penetration for wind and solar photovoltaic (PV) system capacity as a share of the total installed capacity by 2020, expanding to 20% in 2030. Capacity targets for renewable energy up to 2030 are 8400 MW for wind, 8400 MW for solar PV and 1000 MW for Concentrated Solar Power (CSP).



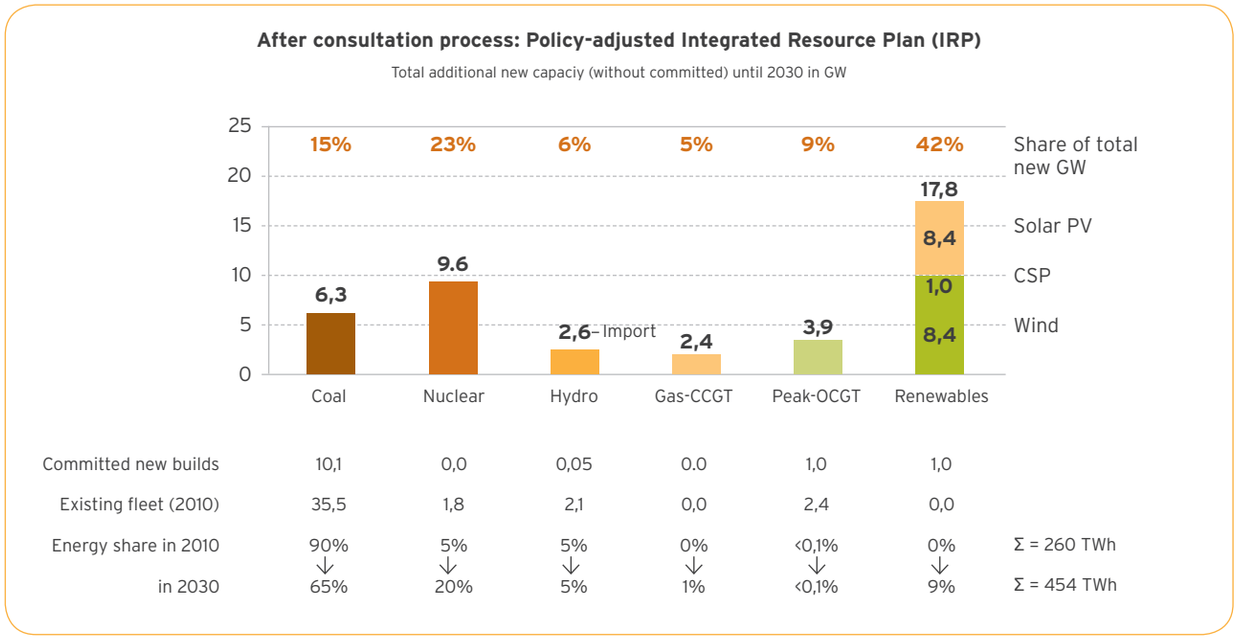


Figure 29: Summary of IRP 2010
Source: Department of Energy (2010)

History of South Africa's electricity sector

The history of the electricity sector in South Africa is characterised by very high growth in electricity intensity over the long term, as illustrated in Figure 30. There has also been a high level of volatility in the supply of electricity. South Africa's resource-based economic growth trajectory has played an important role in the electricity-intensive nature of the economy. Indeed, the discovery of diamonds (1867) and gold (1886) were catalysts for the introduction of electricity on a commercial scale. Gold mining has been a major driver of electricity consumption, particularly as mines became deeper, increasing the amount of electricity utilised for the same quantity of output.

The generation of electricity increased significantly in the 1932–1940 period (growing at an annual average rate of 14%, against a 7.6% growth in GDP), largely because of an increase in the price of gold, alongside the following developments:

- more households started using electricity;
- mechanisation continued – Iscor and the African Metals Corporation (AMCOR) commenced with metals and ferroalloys production respectively;
- mining activity expanded, with mines becoming deeper;
- negotiations with mines to build a new plant (Klip) resulted in an 11.5% fall in the cost of electricity.

Between 1947 and 1973, the introduction of import controls, together with the discovery of further gold resources, led to a sharp rise in the demand for electricity. This was reinforced by the further expansion of electrified rail transport in 1950. Consequently, supply constraints arose in 1951, despite the construction of additional power stations. The power crisis was resolved in 1960 when electricity supply capacity was doubled. The average annual rate of increase in electricity demand during the 1947–1973 period was 8%, against a GDP growth rate of 5%.

In the light of current controversies surrounding electricity price hikes, it is interesting to note that South Africa's electricity price increases were exceptionally high during the 1974–1978 period: 16.5% in 1975; 30.3% in 1976; 48.2% in 1977; and 16.5% in 1978. During this period GDP increased at an average annual rate of only 1.7%, while the electricity sector grew at an average annual rate of 7%.

From 1980 to 1986, blackouts and brown-outs caused major protests, resulting in an electricity crisis. In response, more power stations were built within a relatively short period of time, in order to meet the rising demand. Electricity prices increased further (by 12.7% in 1981; 22.9% in 1982; and 19.8% in 1983). Despite the turmoil caused by the global oil price crisis of 1986, the recovery of the steel industry in 1984 and the high growth in gold mining resulted in growing electricity demand. Thus although the average annual GDP growth was only 1.1%, the electricity sector grew at an annual average rate of 4.7% per annum during this period.

Ironically, in the 1987–2007 period, South Africa's electricity supply capacity substantially exceeded the demand for electricity. Consequently, between 1990 and 2000, the real price of electricity decreased. Following the first democratic elections in 1994, major changes occurred in the South African electricity environment, including:

- the establishment of the Atomic Energy Corporation's plant in Pelindaba (1995);
- the establishment of a National Electricity Regulator in 1995 (now NERSA); and
- the publication of the White Paper on Energy Policy (1998).

The exceptionally cold winter of 1996, alongside the establishment of the new Hillside aluminium smelter, Columbus Steel and other heavy mineral plants, resulted in a very high demand for electricity. In the same period, the Saldanha Steel plant reached full capacity.

Further energy sector reforms and policy developments included the following:

- in 2002 Eskom was transformed from a statutory body to a public company – Eskom Holdings Limited, in terms of the White Paper on Energy Policy Act (Government of RSA 2001a);

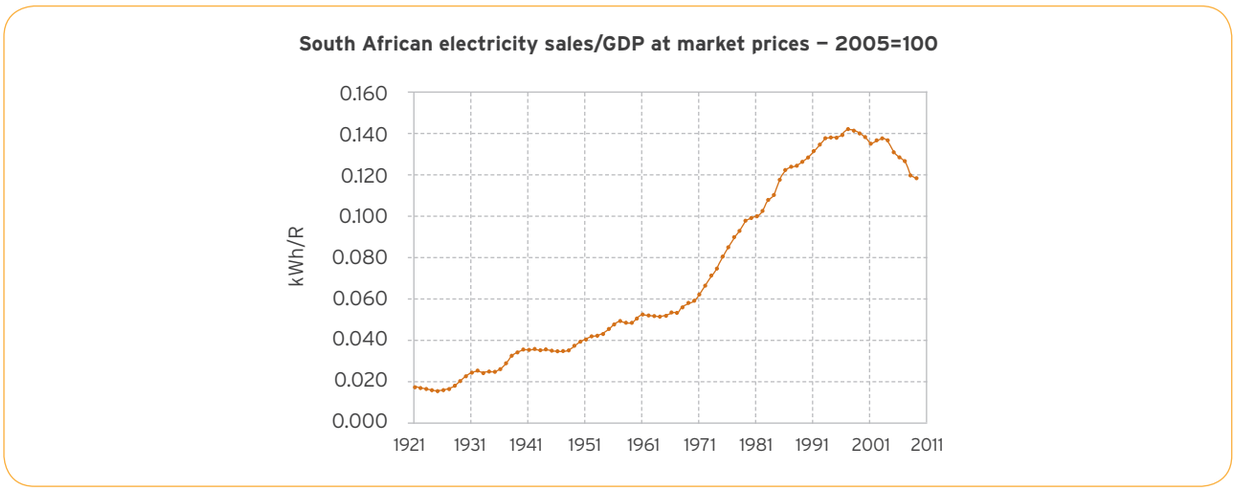


Figure 30: Index of electricity intensity in South Africa, 1921–2011

Source: Eskom (2011)

- in 2003 the White Paper on Renewable Energy (Department of Minerals and Energy 2003) was released;
- in 2004 the National Energy Regulator Act (Government of RSA 2004) was promulgated and the importation of natural gas from Mozambique to South Africa commenced;
- in 2005, NERSA was established as a successor to the energy regulator created in 1995.

In January 2008, South Africa experienced another electricity supply crisis, evidenced by widespread load shedding. At the end of the same year, the global financial crisis emerged, driving the South African economy into recession. Consequently, electricity demand contracted by -2.2% and -2.7% in 2008 and 2009 respectively. In 2009, measures were put in place to deal with the electricity crisis, including the reduction of supply to electricity intensive users such as mines and smelters.

In order to deal with the long-term challenges posed by the electricity sector, the South African Government promulgated an Integrated Resource Plan for Electricity 2010-2030 (IRP 2010) (Department of Energy 2010) in May 2011, following extensive modelling of the electricity sector and stakeholder consultations. The IRP 2010 was approved by Cabinet in 2011 as a long-term strategic plan to guide the expansion of electricity supply over the 2010-2030 period. To that end, it identifies investments in the electricity sector that are necessary to enable it to meet the anticipated demand for electricity in the most efficient manner.

Notably, the level of electricity intensity started a decline from the early 2000s. This was due to the growth of economic sectors which are less electricity intensive, such as the financial services sector, and was reinforced by:

- improvement in energy efficiencies of existing facilities;
- new technologies using less energy per unit produced;
- downsizing electricity intensive products such as copper and plastic/fibre;
- recovery and recycling of some materials/commodities.

Nevertheless, by international standards, energy intensity remains high.

Electricity sector demand and load profiles

Electricity is a crucial component of the final energy mix in South Africa, accounting for 28% of total energy consumption in 2006, as illustrated in Figure 31. Furthermore, the iron and steel sub-sectors are the most important industrial users, followed by non-ferrous metals, chemicals, and non-metallic minerals.

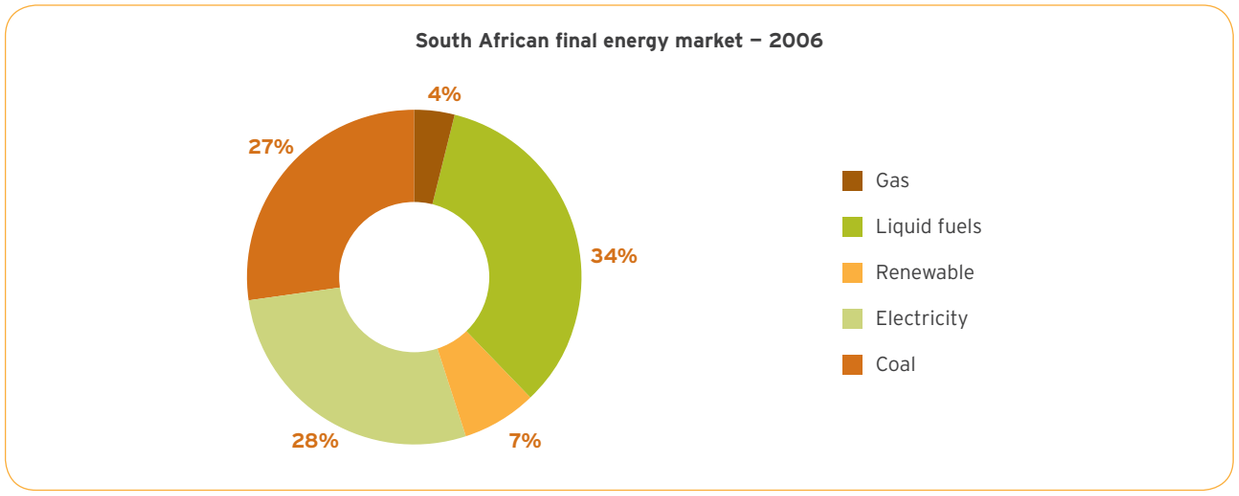


Figure 31: South African energy market in 2006
Source: Department of Energy (2009)

South Africa has a very diverse electricity market. Electricity consumers vary from high energy intensive users (units of energy consumed per unit of GDP produced) such as deep level mines, non-ferrous smelters, ferroalloy smelters, basic iron and steel plants; to low energy intensive users such as commercial and residential consumers. Although the economy has historically been characterised by high energy intensity, its structure has changed over time due to the growing contribution of the services sector to economic output (see Figure 32).

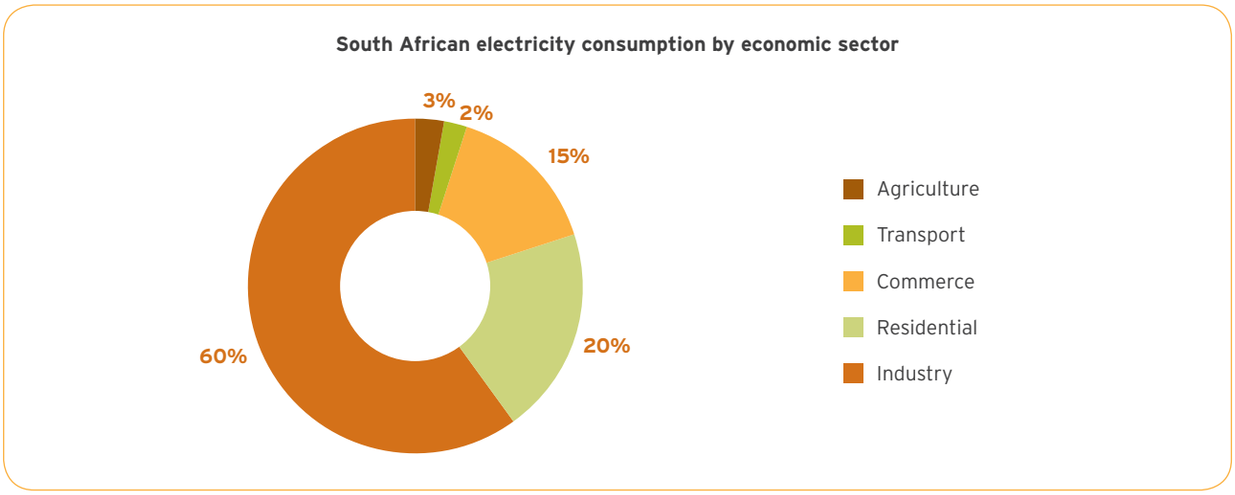


Figure 32: Electricity consumption by economic sector, 2006
Source: Department of Energy (2009)

By international standards, however, energy intensity remains high. Recovery or recycling of commodities, the use of plastic or fibre instead of copper, and the adoption of more energy efficient processes are some of the measures that should be actively promoted in order to reduce the energy intensity of the South African economy.

Electricity demand patterns/load profile

It is important to note that there is a distinct pattern in the demand for electrical energy. The pattern of demand is referred to as the 'load profile'. Figure 33 illustrates the hourly maximum demand of the Eskom integrated system (the hourly load profile) over one week. The morning and evening peaks are clearly visible. Hourly demand for a full year, i.e. for 52 weeks, is displayed in Figure 34. It illustrates that low temperatures result in a higher demand for electrical energy in winter. Although the history of the load profiles lies beyond the scope of this report, it is important to note the difference between electrical energy provision and maximum demand.

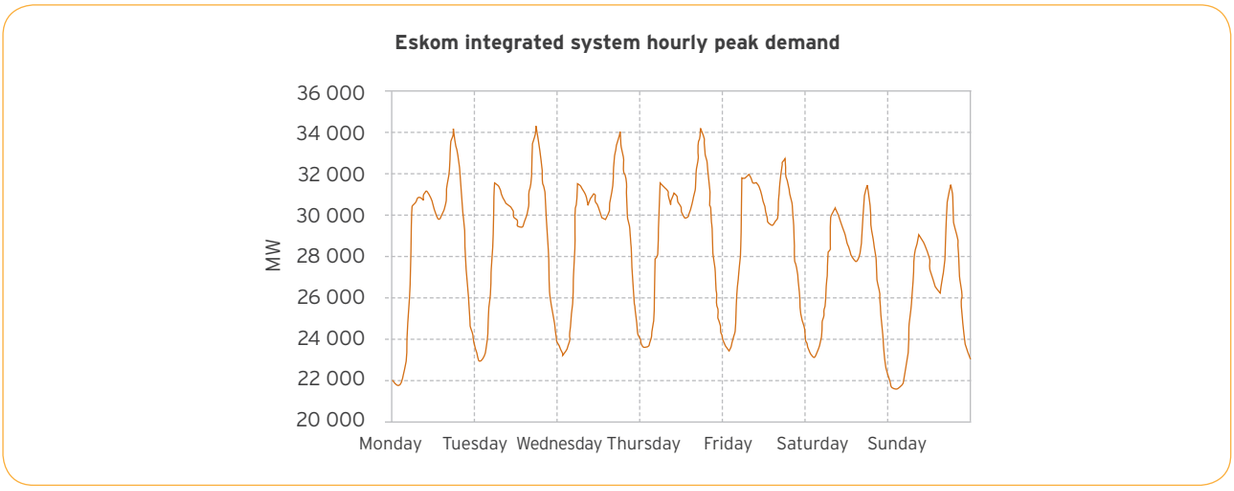


Figure 33: Hourly demand for electricity over one week
Source: Eskom (2011)

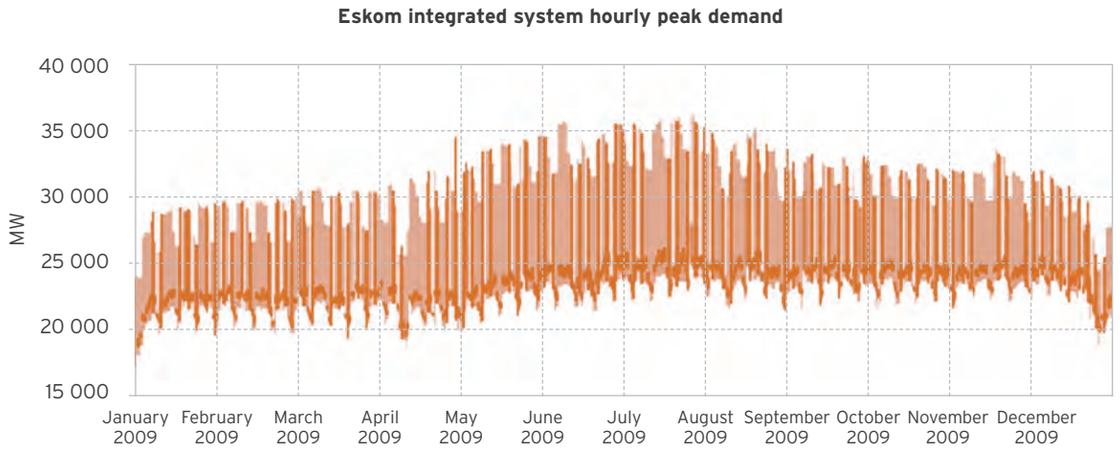


Figure 34: Annual demand for electricity, 2009

Source: Eskom (2011)

The area under each curve is the electrical energy (electricity) sent out. Electricity sent out includes electricity sales demand by the consumer, plus transmission and distribution system losses. From a capacity point of view, an electricity power supply with a maximum winter demand of just over 35 000 MW (Figure 34) plus a reserve margin of about 15% is required to meet the hourly electricity demand as shown in Figure 33. When a forecast for electricity demand is undertaken, the hourly demand is forecast in two steps: firstly, the electricity sales demand is projected for each year of the period (with electricity losses added to the electricity sales demand), which yields the electricity 'sent out' demand; secondly, the hourly demand forecast is then derived from the electricity demand 'sent out' forecast and the use of hourly load profiles along with other inputs.

Investment in electricity infrastructure

In terms of investment in electricity infrastructure, South Africa has two distinct time horizons: the Medium-Term Risk Mitigation Project (covering the 2010–2016 period); and the IRP 2010, which is a long-term plan that does not deal with immediate electricity shortages. In the short term, supply shortages are anticipated as illustrated in Figure 35.

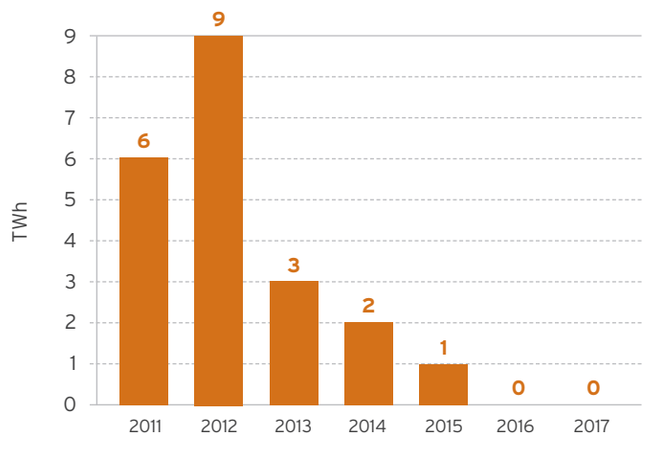


Figure 35: Energy gap forecast before mitigation (TWh) 2011–2017

Source: Department of Energy (2010)

To address these shortfalls, the following short-term demand and supply-side initiatives are required:

- The demand-side programme must be effectively implemented;
- The targeted rollout of one million solar water heater geysers must be achieved;
- Innovative incentive-based mechanisms must be created for customers to contribute to demand-side response programmes;
- Non-Eskom co-generation, own generation and renewable energy generation targets of 2300 MW must be achieved in the next three to five years;
- Eskom should increase its generation capacity by between 1% and 2%; and
- Eskom's return to service plants must be brought back into operation as planned.

However, even if all potential is captured to mitigate the shortfall, a gap will still exist in years 2013 to 2017, as illustrated in Figure 36 below.

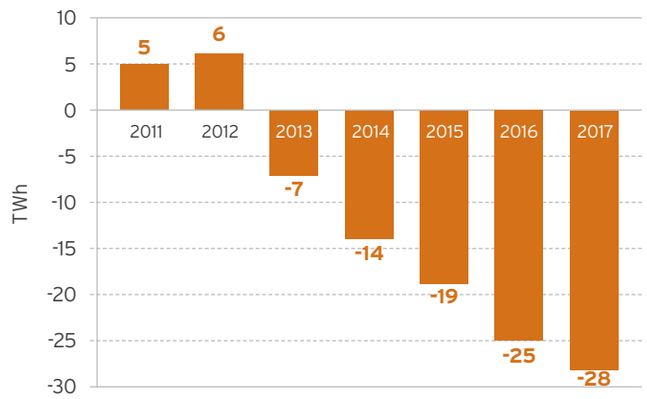


Figure 36: Energy gap forecast after mitigation, 2011–2017
Source: Department of Energy (2010)

Eskom Build Programme

In 2005, Eskom commenced a capacity expansion programme which is expected to add approximately 17 120 MW to the current system capacity over the next seven years. The capacity expansion involves new coal-fired power stations, such as Medupi and Kusile, with capacity of approximately 4800 MW each, which will contribute 56% to the capacity expansion mix. Furthermore, three old coal-fired power stations that were mothballed are now being returned to service, and will contribute 22% to the capacity expansion mix. The Ingula pumped storage scheme (1330 MW) together with renewable energy projects (such as the 100 MW Eskom CSP project and 100 MW wind project) will contribute a further 20%. The refurbishment of transmission infrastructure constitutes 2% of the expansion capacity projects.

Progress on the Eskom build programme is shown in Figure 37. By year end 2011 Medupi was 32% complete against a scheduled 38.5% and Kusile was 15% complete versus a scheduled 18,5%. Medupi's first generating unit, planned to be on line in December 2012, has been delayed to the second half of 2013. Kusile is still expected to be delivered on schedule.

The funding sources for the Eskom programme are diverse. They include multilateral institutions such as the World Bank (WB) and African Development Bank (AfDB); export credit agencies (linked to the supply of technologies); development finance institutions such as the DBSA; shareholder loans from the South African Government; bonds raised by Eskom, commercial paper and other sources, as summarised in Table 27.

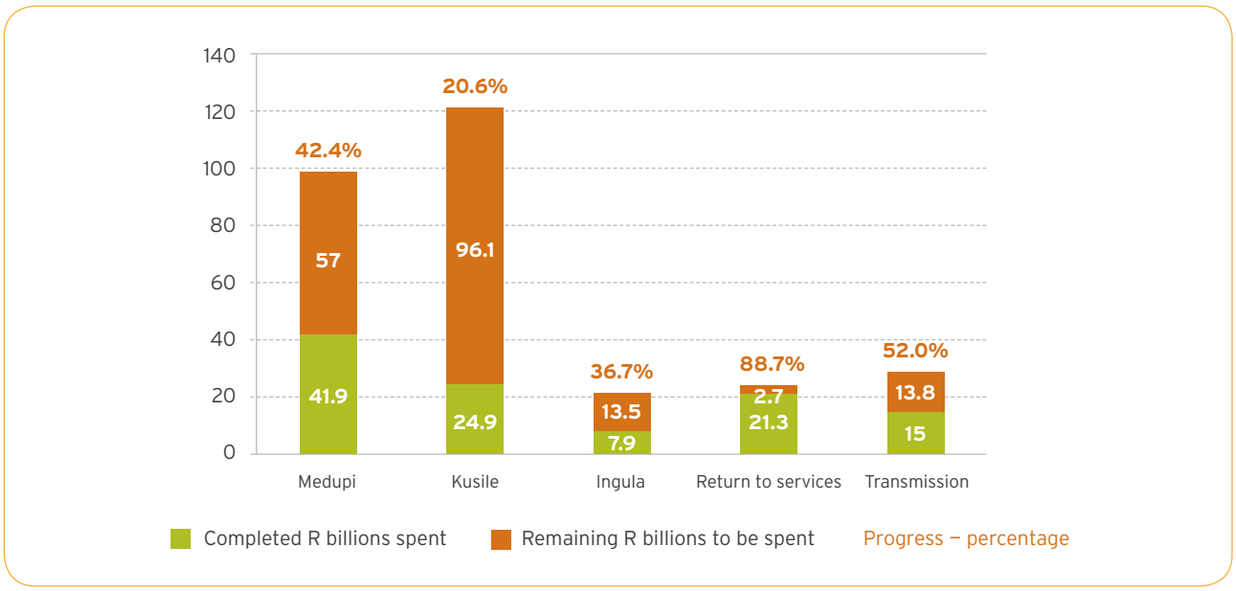


Figure 37: Eskom Build Programme progress, 2011
Source: Eskom reports and RMB FICC Research (2011)

Table 27: Eskom funding plans to 2017 (R300 billion)

Source of funds	Funding sourced (R billion)	Currently secured (R billion)	Drawdowns to date (R billion)	Amount supported by government (R billion)
Bonds	90.0	26.7	26.7	15.0
Commercial paper	70.0	70.0	10.0	0.0
ECA backed loans	32.9	32.9	7.5	0.0
World Bank loan	26.1	26.1	2.6	26.1
AFDB loan	21.0	21.0	3.9	21.0
DBSA loan	15.0	15.0	1.0	0.0
Shareholder loan	20.0	20.0	20.0	20.0
Other sources	25.0	0.0	0.0	0.0
Total	**300.0**	**221.7**	**71.7**	**82.1**
Percentage		**70.6**	**33.9**	**38.8**

Source: Eskom and RMB FICC Research (2011)

Electricity sector institutions

The fact that Eskom is a monopoly necessitates economic regulation of the industry to ensure that the interests of customers, licensees and other stakeholders are balanced, while also ensuring the industry's sustainability.

In 2002, Eskom was converted into a Schedule 2 public entity under the Public Finance Management Act (PFMA) (Government of RSA, 1999) in terms of the White Paper on Energy Policy Act (Government of RSA, 2001). Since then, the legislative framework applicable to any corporate entity in South Africa is applicable to Eskom. These include the Companies Act, National Environmental Management Act, competition and labour laws, and tax legislation. In addition, legislation specifically applicable to state-owned entities – the Public Finance Management Act, the Promotion of Access to Information Act and the Promotion of Administrative Justice Act – also apply.

Eskom is regulated by the National Energy Regulator of South Africa (NERSA) in accordance with the Electricity Regulation Act (Government of RSA, 2006). The key objectives of the Electricity Regulation Act are:

- efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa;
- long-term sustainability of the industry;
- investment in the industry;
- universal access to electricity;
- diverse energy sources and energy efficiency;
- competitiveness and customer choice; and
- fair balance between interests of customers and end-users, licensees, investors and the public.

In addition to the two central players – Eskom and NERSA – there are a number of more peripheral institutions that play a role in the energy sector. Their roles are summarised in Table 28.

Table 28: Institutions in the electricity sector

Institution	Role
Independent Power Producers (IPPs)	Private investors can apply to NERSA for licences to supply electricity through or outside of a tendering process.
Municipalities and the Electricity Distribution Industry (EDI)	The EDI is publicly owned and comprises 187 municipalities. The market is not competitive. Constitutionally, municipalities have the first right to supply customers in their area of jurisdiction.
National Energy Regulator of South Africa (NERSA)	Issues licences for the operation of generation, distribution and transmission infrastructure; regulates imports, exports and trading of electricity; determines and approves electricity prices, tariffs and the conditions under which electricity may be sold.
National Nuclear Regulator (NNR)	Regulates the operation of nuclear power stations, such as Koeberg and all elements of the South African nuclear energy value chain. Its role is to protect people, property and the environment against nuclear damage.
Department of Public Enterprises (DPE)	The Minister of Public Enterprises is the shareholder representative of the South African Government and has oversight responsibility for Eskom. This relationship is governed by a shareholder compact.
Department of Energy (DoE)	Has oversight responsibility for the energy sector, including the electricity sector, which is governed mainly through the Electricity Regulation Act (4 of 2006).
National Treasury	Is responsible for financial and reporting oversight for Eskom, as a state-owned entity, and has played a pivotal role in providing government loans and guarantees in favour of Eskom.
Department of Water Affairs	Oversees water allocations and ensures that there is adequate water supply infrastructure for the South African electricity sector.
Department of Environmental Affairs	Ensures adherence to environmental compliance and protection of rights relating to the prevention of pollution, ecological degradation, the promotion of conservation and securing ecologically sustainable development.

Each of the entities in this large and complex array plays a role in the provision of electricity in South Africa. As IPPs increasingly enter the electricity generation sub-sector, it is critical that there is effective coordination and efficient execution of the respective roles of these institutions.

Policy, legislation and regulation of the electricity sector

As alluded to earlier, the IRP 2010 provides a long-term strategic framework for the future development of the electricity sector. Between 2011 and 2030, the target for the new build programme is for 42% of energy requirements to be provided from renewable energy sources (excluding the current Eskom build programme). By 2030, it is anticipated that the percentage of energy generated from CO_2 free sources (including nuclear energy) will be nearly 30%.

The central policy challenge is to create both appropriate incentives and regulatory structures to encourage private investment in renewable and base load energy. Hitherto, the dominance of Eskom, alongside the absence of incentives and uncertainty in the regulatory environment, has discouraged the emergence of a vibrant IPP industry.

In order to address this challenge, Cabinet approved the establishment of an Independent System and Market Operator (ISMO) in March 2011, a mechanism to support the introduction of IPPs by creating a non-conflicted buyer of power. In terms of incentives to encourage investment in renewable energy, the government introduced the Renewable Energy Feed-in Tariffs (REFIT) to make investment in

the renewable energy industry more attractive to the private sector. However, REFIT has since been replaced with the IPP procurement programme, which calls for competitive bids based on a price ceiling determined by the REFIT guidelines. It also requires economic development criteria to be met, including local content. The first bid process that closed in November 2011 yielded 1415 MW of renewable energy from independent producers.

Challenges

The key challenge for electricity generation, transmission and distribution in South Africa is ageing infrastructure. Some of the existing electricity generation infrastructure consists of power plants that were built in the 1950s. These power plants will have to be decommissioned as they reach the end of their operational life. By 2030, 10 902 MW of generation capacity will be decommissioned.

South Africa's electricity system is under pressure due to a relatively low reserve margin. As long as the reserve margin remains low, there will be a risk of supply interruptions, particularly during evening peaks and cold winter periods, when the demand for electricity is high. Eskom is in the process of building new generation capacity to meet this increasing demand. However, the utility is unable to build the required capacity on its own due to operational and capital constraints.

There are two ways in which to resolve the challenge of constraints in electricity capacity:

- To build a robust IPP industry that will substantially increase generation capacity, including base load and renewable energy; and
- To pursue opportunities in the SADC region within the framework of the Southern African Power Pool (SAPP), both to expand generation capacity and as an important lever to diversify the sources of electricity away from coal and towards cleaner sources of electricity such as hydroelectric power and gas.

As regards the latter option, the SAPP was created in August 1995 through an Inter-Governmental Memorandum of Understanding (MOU), which aimed to optimise the use of available energy resources in the region and provide a platform for member states to support one another during emergencies. The vision of the SAPP is to:

- facilitate the development of a competitive electricity market in the SADC region;
- provide end users with a choice of electricity supply;
- ensure that the Southern African region is the region of choice for investment by energy-intensive users; and
- ensure sustainable energy developments through sound economic, environmental and social practices.

In order to address the challenges of power shortfalls in the SADC region and to increase the fluidity of the regional power market, major investments in strategic generation and transmission infrastructure projects have been planned. While there are many projects that can be developed in the region due to the vast resources that are available, they often fail to attract investments due to poor structuring as well as the lack of capacity to package them for bankability. SADC/SAPP and the Regional Electricity Regulatory Authority (RERA) have identified the projects summarised in Table 29, as priority projects that need to be developed in order to address the capacity constraints in SADC generation and transmission networks.

Table 29: SADC/SAPP/RERA Priority Projects

Country	Project	Description	US$
Mozambique	Mozambique Transmission Backbone	800 HVDC & 400 kV	2.4bn
	Benga Thermal Project	500-2 000 MW	1.3bn
	Moatize Thermal Project	1 500–2 400 MW	
	Mphanda Nkuwa Hydro Project	1 500 MW	3.0bn
Zambia	Kariba North Bank Extension	360 MW	518mn
	Itezhi-Tezhi Generation & Transmission	120 MW	200mn
Zimbabwe	Hwange Expansion	600 MW	600mn
	Sengwe Power Station	1 400 MW	1.6bn
	Kariba South Extension	300 MW	200mn
Regional	Zambia-Tanzania-Kenya Interconnector	400 HVAC	
	ZIZABONA (Zimbabwe-Zambia-Botswana- Namibia)	330 kV & 220 kV	225mn
	Central Transmission Corridor (CTC)	400 kV	100mn

Source: SAPPA (2011)

The immediate priority is therefore to systematically remove obstacles to the expansion of generation and extension of transmission to address constraints and challenges in the energy sector.

6 Water sector

Operational challenges in the water sector arise both at national and municipal levels and centre on weak institutional capacity and a shortage of skills

South Africa ranks as one of the most water-scarce countries in the world. The main source of water is surface water from rivers and dams, sustained by rainfall. This is not only inadequate in relation to the total demand for water, it is also over-allocated in many areas. Water sector infrastructure in South Africa comprises water resources and water services. Water resources infrastructure is developed to exploit the raw water resource in rivers in order to supply households, major industries (mines, Eskom) and agriculture with water - essentially bulk infrastructure. Figure 38 below, illustrates the water value chain.

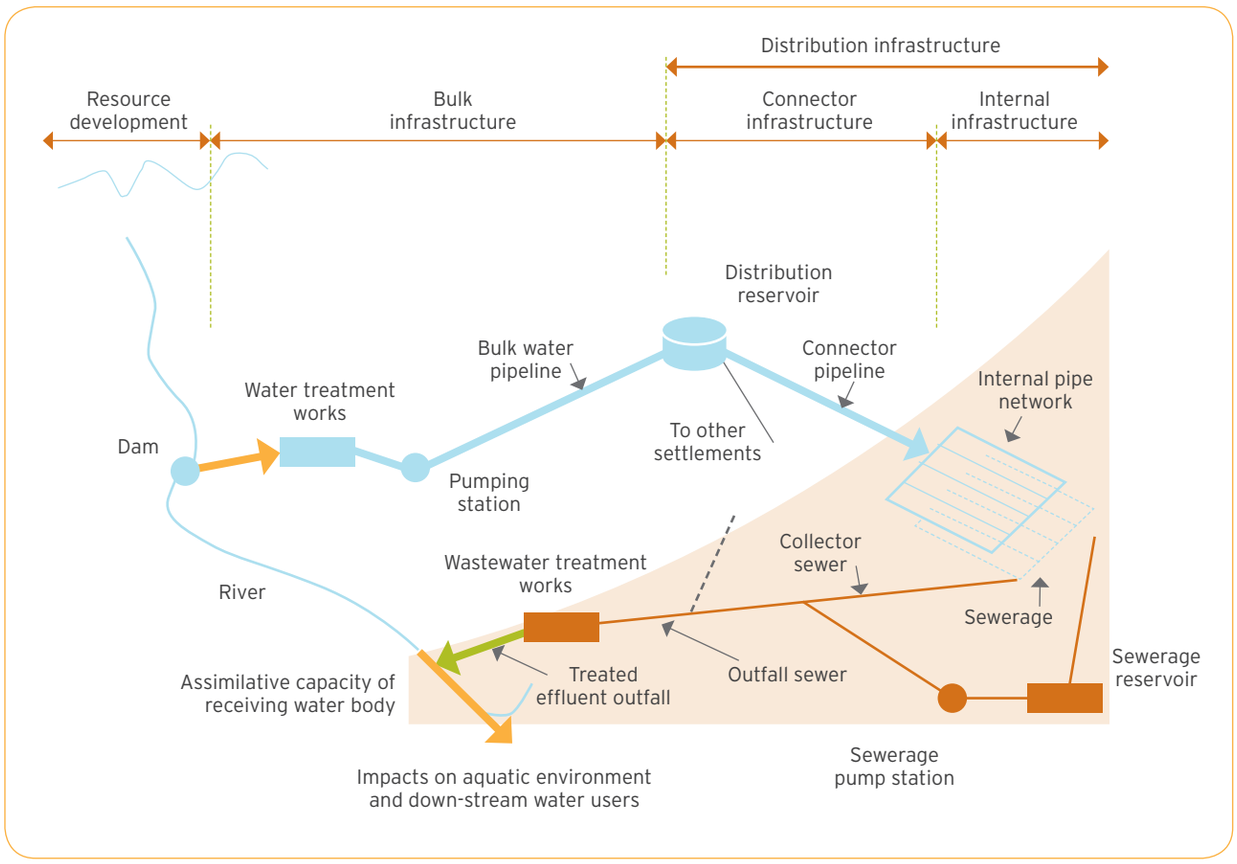


Figure 38: Components of water sector infrastructure

Source: Balzer (2011)

Current sector goals and objectives

The government has set 2014 as the new target date for providing basic water supply and sanitation services to all South Africans. Over the current Medium Term Strategic Framework period (2009–2014), the water sector will continue to focus on the following:

- meeting targets for the delivery of water supply and sanitation services to ensure 100% access;
- managing South Africa's scarce water resources and supporting the development of bulk water resources infrastructure for long-term sustainability;
- spearheading transformation in the water sector as regards water allocation;
- improving the regulatory and institutional environment; and
- curbing water losses by at least 50% of the national average of 35%.

These objectives are underpinned by comprehensive water resources and water services programmes. The objective of the water resources programme is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all people. For the water services programme, the objective is to ensure that all people in South Africa have access to adequate, sustainable, viable, safe, appropriate and affordable water and sanitation services; use water wisely; and practice safe sanitation.

Characteristics of South Africa's water sector

Four of South Africa's main rivers are shared with other countries. These are the Limpopo, Inkomati, Pongola (Maputo) and Orange (Senqu) Rivers, which together drain approximately 60% of the country's land area and contribute about 40% of the total surface runoff (river flow). Industries that generate approximately 70% of gross domestic product (GDP) and a similar percentage of the population are supported by water supplied from these rivers. Hence their judicious joint management is of paramount importance to South Africa.

To facilitate the management of water resources, the country has been divided into 19 catchment-based water management areas. There are imbalances between the supply of and demand for water in these water management areas. Of the 19 water management areas only one (Umzimvubu to Keiskamma), is currently not linked to another management area through inter-catchment transfers. The inter-linking of catchments gives effect to one of the main principles of the National Water Act of 1998, which designates water as a national resource, in terms of assuring water security. Eleven of the 19 water management areas share international rivers.

Most of the runoff in South Africa is in the eastern part of the country and is as a result of variations in the country's rainfall patterns which are influenced by the warm Indian Ocean current to the east of the country. Most of the Northern Cape Province is dry, thus having the smallest unit runoff as illustrated in Figure 39 below.

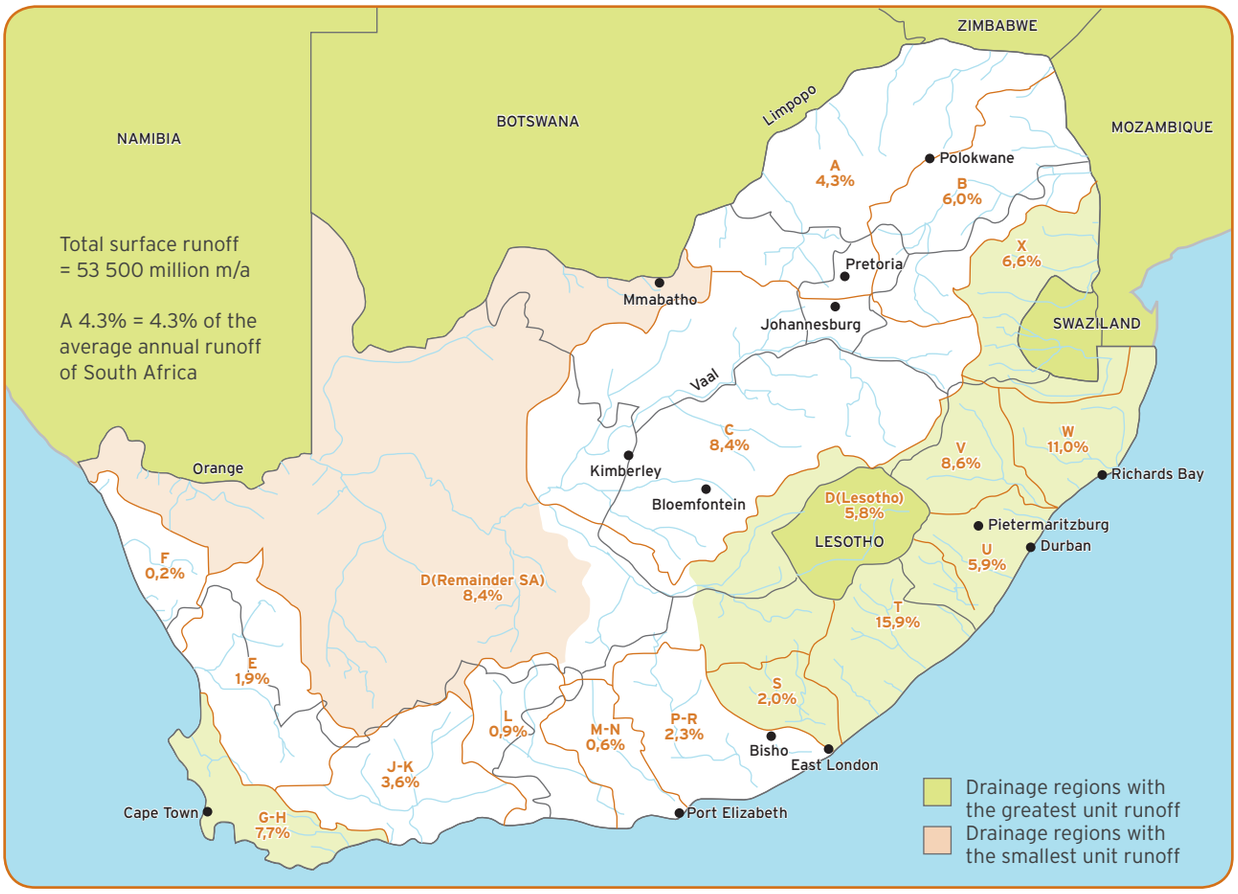


Figure 39: Distribution of surface runoff in South Africa

Source: Department of Water Affairs (2004)

South Africa's rainfall patterns are characterised by periods of drought which can last up to 10 years. Consequently, large storage reservoirs are needed to mitigate against these periods of drought, in order to ensure a continual supply of water. South Africa has developed a number of inter-basin transfer schemes to transfer water from areas of abundance to areas of deficit.

Extent and location of water sector infrastructure

There are two distinct types of water infrastructure: water resources (bulk) infrastructure and water services infrastructure. They are discussed separately below.

Storage Dams

Figure 40 illustrates the location of different types of dams. South Africa has approximately 4 718 dams which include those owned by the Department of Water Affairs (DWA) and those owned privately. The DWA owns approximately 305 dams with a total capacity of 29.2 billion m^3 which account for 70% of the total dam capacity in the country.

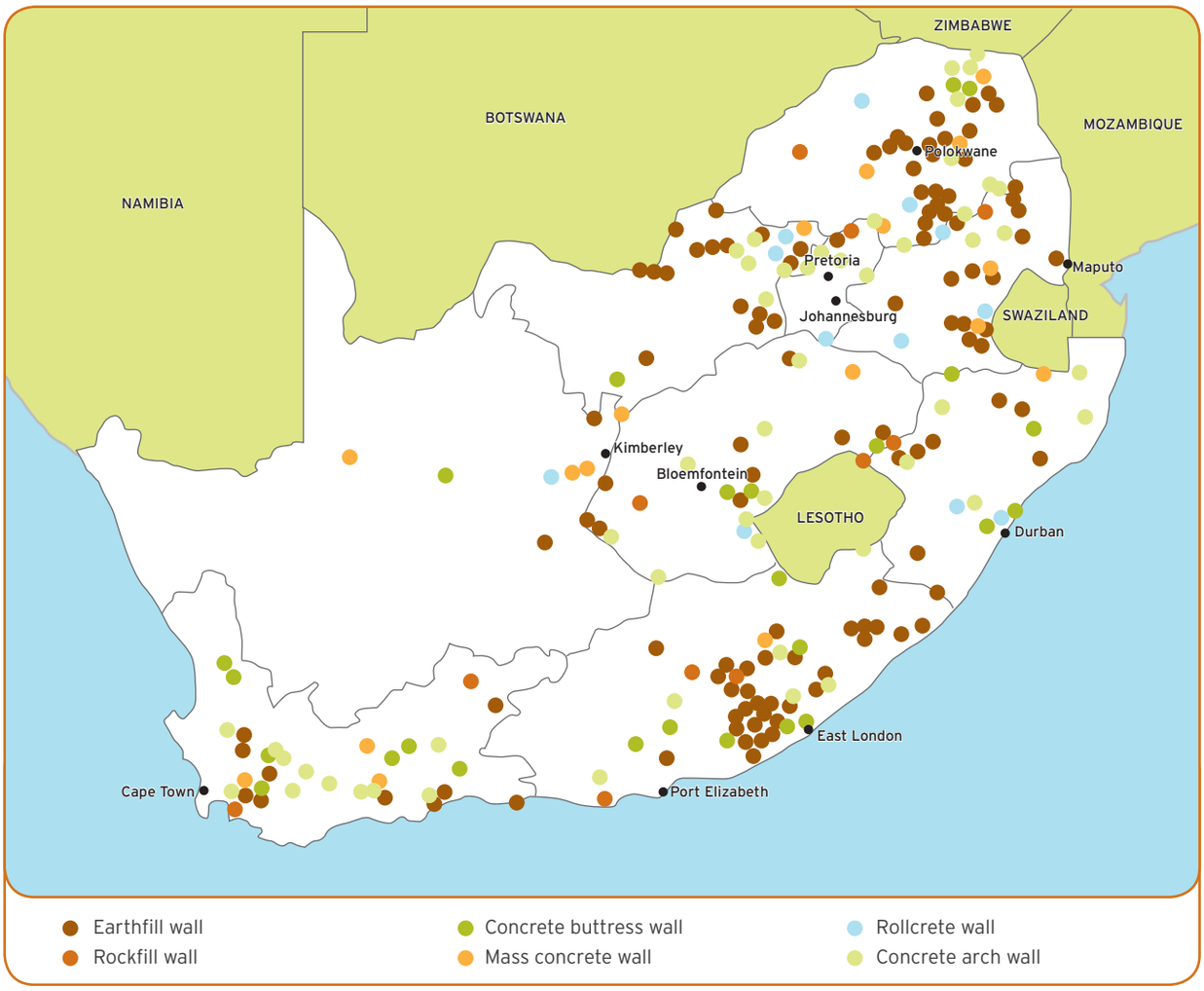


Figure 40: Location of dams in South Africa by wall types
Source: Department of Water Affairs (2011)

Dams in South Africa are classified as large, medium or small. For the dams owned by the DWA, 32% are classified as large, 24% as medium, and 43% as small. Some 1% of storage dams are not classified. More than 25% of DWA-owned dams are located in the Eastern Cape and 15% in Mpumalanga. The Gauteng Province, which is home to the largest percentage of South Africa's population, has the lowest proportion (3%) of DWA-owned dams.

In order to reconcile the imbalances of water demand and supply in water management areas, the DWA has developed transfer schemes that deliver bulk raw water from areas of surplus to areas of deficit. These also transfer water to neighbouring countries such as Botswana, Swaziland, Mozambique and Namibia. Figure 41 shows the extent of the current transfer schemes.

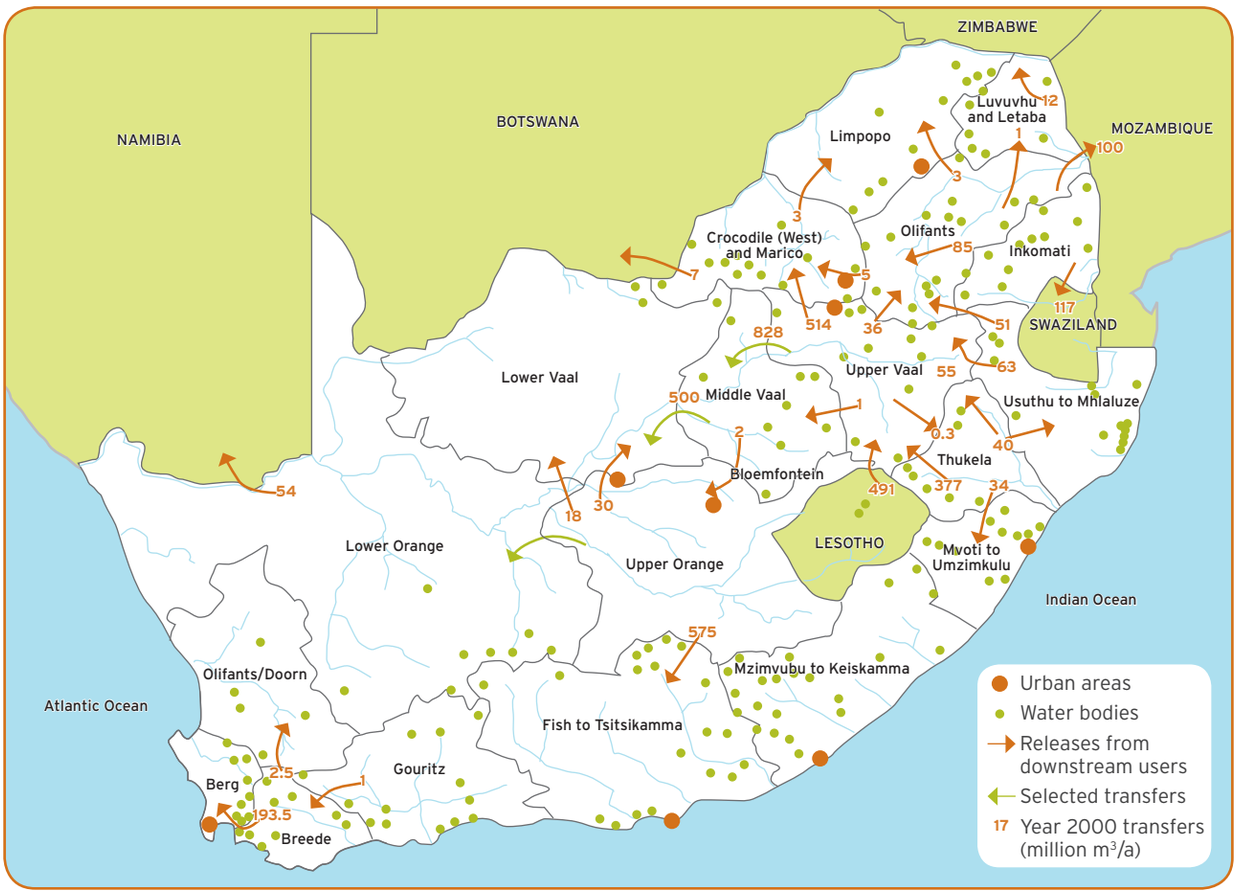


Figure 41: Major transfer schemes between water management areas

Source: Department of Water Affairs (2004)

The development of transfer schemes was largely driven by the need to meet water demand for economic activities that are located far from water resources. The key demand centres are the metropolitan areas and large towns. The map in Figure 42 illustrates the locations of bulk water resources infrastructure.

In 2007 the DWA commissioned reconciliation studies in the water supply systems (WSS) serving areas of high demand, which found that water conservation and water demand management is the only feasible option in the short to medium term. Thus a network of infrastructure was established to supply water to key demand areas.

Water services infrastructure

Water services infrastructure is divided into the following categories, each of which is discussed further below:

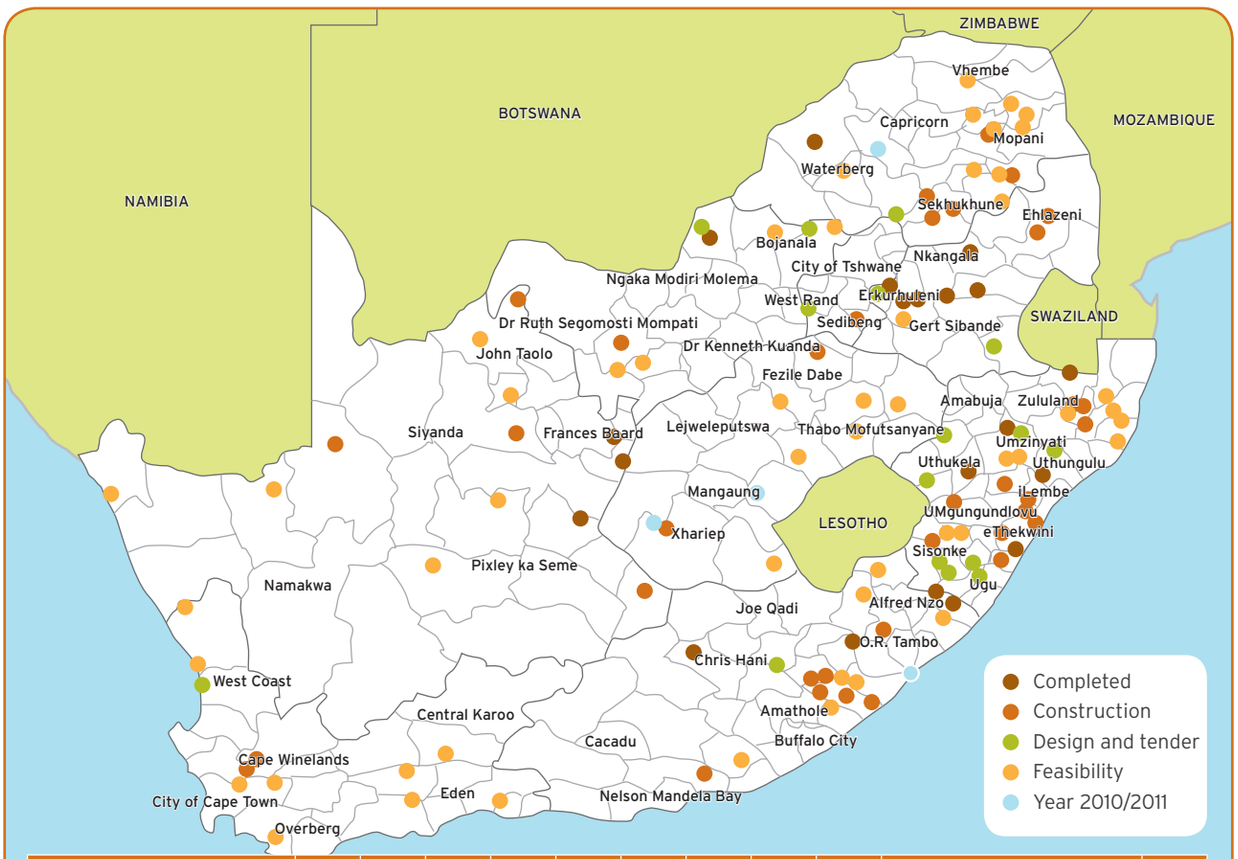
- regional bulk water services, usually managed by water boards and the Department of Water Affairs, to supply water to several local municipalities either directly or in bulk;
- local water and wastewater treatment plants; and
- internal distribution and reticulation networks.

Regional bulk Infrastructure

Regional bulk water services infrastructure includes raw water abstraction, treatment works, reservoirs and distribution pipelines to supply water in bulk across municipal borders and over vast distances. Water Boards operate most of this infrastructure. In 2007 the DWA commissioned a Regional Bulk Infrastructure Programme (RBIP) in order to optimise economies of scale and fast-track the delivery of sustainable water services to local communities, especially in rural areas. The programme is financed through a Regional Bulk Infrastructure Grant (RBIG). Figure 43 illustrates the location and status of the current regional infrastructure programmes.

Figure 42: Bulk water resource infrastructure

Source: Department of Water Affairs (2011)



Phase	EC	FS	GT	KZN	LP	MP	NC	NW	WC	Phase	No
Completed	3	-	-	4	1	6	3	1	-	Completed	18
Design and tender	1	-	2	2	1	2	-	1	1	Design and tender	10
Feasibility studies	13	6	1	2	9	3	4	7	4	Feasibility studies	49
Under construction 2010/2012	1	2	-	-	1	-	-	-	-	Completion 2010/2012	4
Under construction	11	2	-	8	5	-	3	1	3	Completion later	33
										Total projects	**114**

Figure 43: Regional Bulk Infrastructure projects

Source: Department of Water Affairs (2011)

Water and wastewater treatment plants

There are over 800 water treatment plants and close to 2000 wastewater treatment plants distributed throughout South Africa, as illustrated in Figure 44.

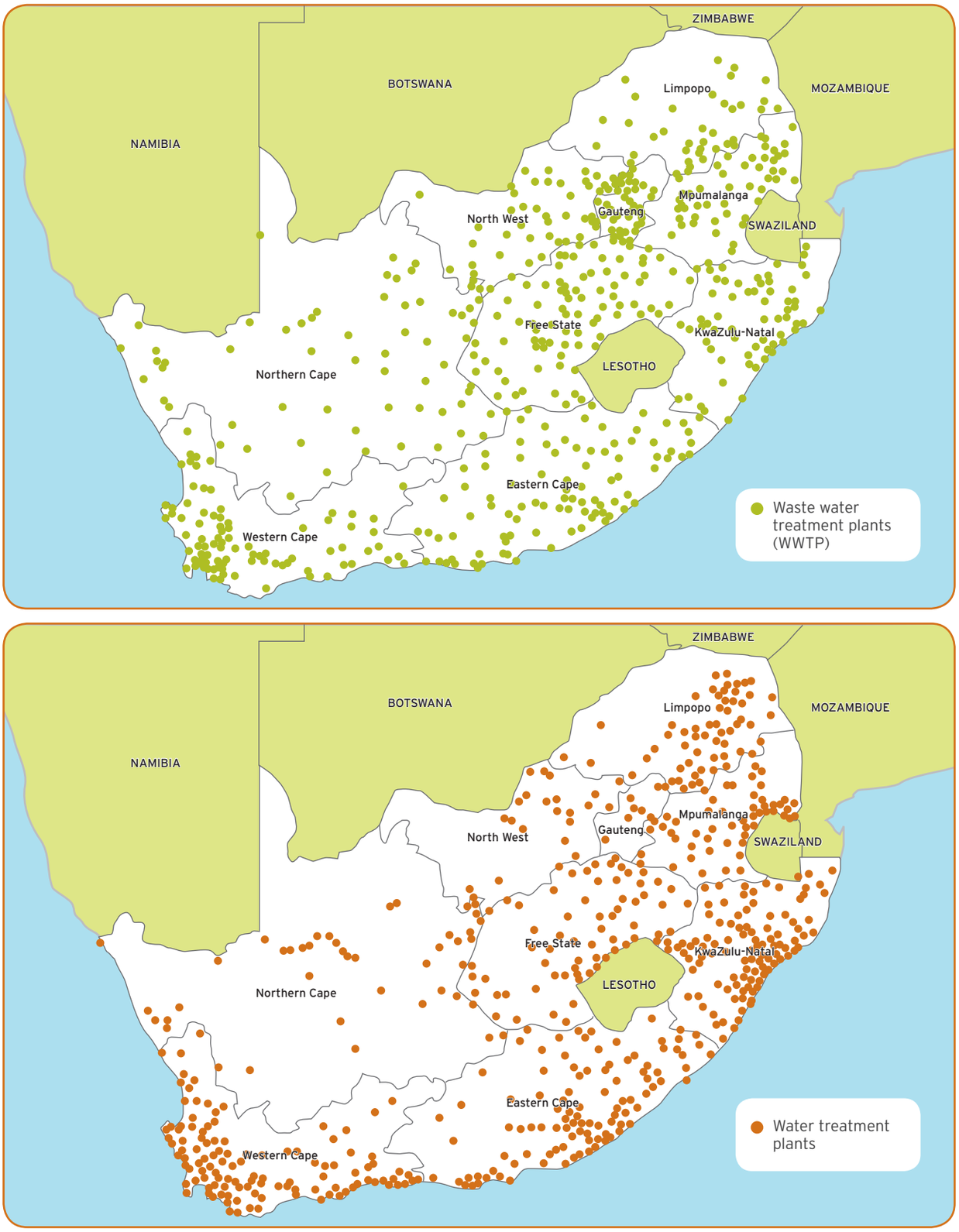


Figure 44: Locations of water (above) and wastewater (below) treatment plants across the country

Source: Department of Water Affairs (2011)

Distribution and reticulation infrastructure

Distribution and reticulation infrastructure comprises pump stations, reservoirs, transmission mains and networks of reticulation infrastructure which are typically located in all municipal areas. Water Services Authorities are responsible for this infrastructure but, in some cases, they appoint water services providers to operate and maintain it.

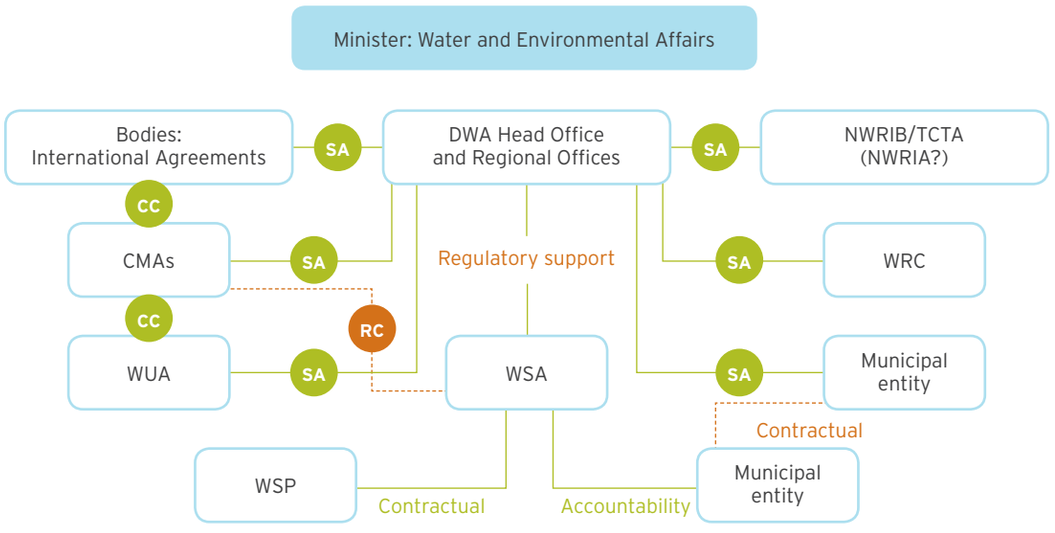
Policy, legislation and institutional frameworks

The political transition in 1994 introduced new water management thinking, which re-defined water as an 'indivisible natural resource', managed by national government for the benefit of everyone.

A significant aspect of water policy in the democratic period is that the system of riparian rights was abolished and citizens' rights to water were changed from permanent property rights to the status of temporary use rights. Furthermore, the basic human right to have access to sufficient water and a safe and healthy environment is now enshrined in the new Constitution and Bill of Rights. These developments ensured that water sector policy and legislative developments in the democratic era focus on redressing imbalances in access to water services. Consequently, the policy emphasis shifted from large-scale infrastructure development to issues of access, with a strong component of social equity, ecological sustainability, water conservation/demand management and decentralisation in the delivery of water services.

The development and management of water resources and the delivery of water services are currently guided by the Water Services Act (Government of RSA, 1997) and the National Water Act (NWA) (Government of RSA, 1998) of 1998. In 2003, a Strategic Framework for Water Services (Department of Water Affairs and Forestry, 2003) was developed as a result of significant changes in the responsibilities of local government, alongside a transformation in water sector institutions.

Several detailed strategies have been developed to give effect to the implementation of this framework. The NWA 1998 provides for the establishment of water sector institutions as vehicles for the implementation of sector policies. The Department of Water Affairs (DWA) under the Ministry of Water and Environmental Affairs is responsible for oversight and coordination of the water sector in South Africa, as illustrated in Figure 45.



CC: Cooperation & Consultation; SA: Statutory Accountability; RC: Regulatory Support; CMAs: Catchment Management Agencies; WSA: Water Service Authority; WSP: Water Service Provider; WRC: Water Research Commission; NWRIB: National Water Resources Infrastructure Branch of DWA; TCTA: Trans-Caledon Tunnel Authority; NWRIA: National Water Resources Infrastructure Agency (envisaged to combine TCTA and NWRIB)

Figure 45: The institutional framework of the water sector
Source: Department of Water Affairs (2004)

The management and protection of water resources and the development, operation and maintenance of national and regional bulk water resources infrastructure are the responsibility of the National Department of Water Affairs through its various agencies: the Trans-Caledon Tunnel Authority (TCTA), Water Boards and regional DWA offices. Municipal water treatment works and distribution and reticulation systems are the responsibility of local government through water services authorities.

Operational issues in the sector

The operational challenges in the water sector arise both at the national and local (municipal) level. They centre on weak institutional capacity and a shortage of skills, particularly in local municipalities. Municipalities have the ultimate responsibility of providing water to final consumers: poor and rich; rural, urban and peri-urban. They are obliged to supply basic water services, even to unplanned settlements.

Weak institutional capacity and the shortage of skills ultimately impact on planning capacity for the development, operation and maintenance of infrastructure. Indeed, weak planning capacity has resulted in a lack of integration in the development of water resources and water services. Typical examples are cases where water services infrastructure is developed without due consideration for the availability of water resources. Inadequate planning capacity also results in the inability of water authorities to prepare business plans that can attract funding from financiers. Hence, lack of access to funding is a constraint arising from poor planning capacity.

Political interference in municipal operations in the development of infrastructure is a further operational issue that affects delivery of water sector infrastructure. Such interference results in funds allocated for water infrastructure development not being appropriately spent.

Utilisation of available infrastructure

In terms of water resource usage, within the SADC region, South Africa makes by far the most intensive use of its water resources. Consequently, a number of South Africa's river basins are already fully utilised. Approximately 77% of surface water which is stored in dams and rivers is used.

Overall, the backlogs of access to water services indicate full utilisation of current water services infrastructure at a national level. Many water treatment works are operated at full capacity or beyond. This trend is a result of the post-1994 focus on developing access infrastructure without the concomitant development of bulk infrastructure (treatment works). These capacity constraints are particularly prevalent in wastewater treatment systems, largely because they have suffered a lack of development due to greater emphasis on increasing access to drinking water. There are, however, a few areas in which treatment works are under-utilised and where operational and maintenance practices are poor.

Value of water sector infrastructure owned by the DWA

The Department of Water Affairs owns, operates and maintains infrastructure that has a replacement value of some R139 billion (excluding land) and a current value of R63 billion. The infrastructure comprises mainly dams, canals, pipelines, tunnels and measuring facilities. This infrastructure is of strategic importance to the country as it not only guarantees the supply of water for human needs, but also ensures a supply of water to strategic industries such as Eskom and the mining sector. The department controls 250 schemes, of which 65 are considered national schemes where raw water is collected and transferred from one catchment area to another. The balance are schemes where raw water is collected and delivered within a particular catchment management area.

The expected life of infrastructure has been attributed at component level and ranges from 10 years (for some small motors) to 300 years (for some dam walls). Figure 46 provides an overview of the original construction dates – it is clear that some assets are over 100 years old (the weighted average age of the portfolio is 39 years).

The infrastructure portfolio is not only ageing; there has also been significant deterioration as a result of insufficient maintenance and lack of ongoing capital renewal.

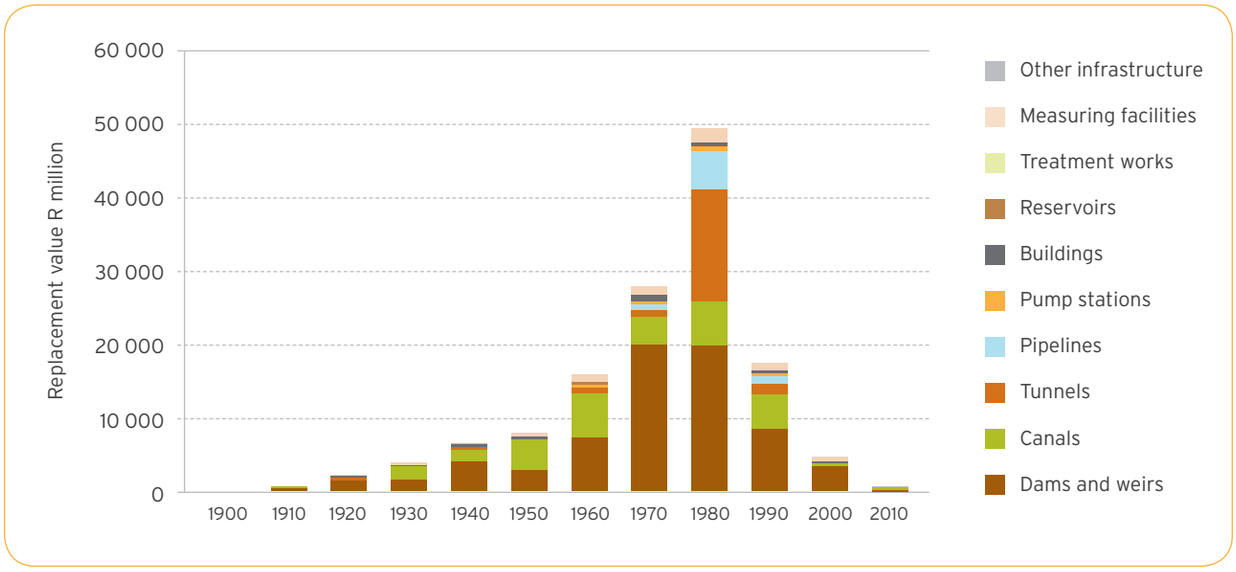


Figure 46: Age profile of assets
Source: Department of Water Affairs (2011)

Municipal infrastructure

South Africa has built a substantial wastewater management industry that comprises close to 2000 treatment plants, of which approximately 850 are municipal bulk treatment plants. Coupled with the extensive pipe networks, pump stations, transporting and treatment this amounts to more than 7 600 000 kilolitres of wastewater processed on a daily basis.

The value of South Africa's water and wastewater treatment equipment market was estimated at US$135 million in 2006, with an annual growth rate of 3.8% (Frost and Sullivan, 2006). Wastewater treatment infrastructure has a capital replacement value of approximately R23 billion and operational expenditure of approximately R3.5 billion per annum. Unfortunately, the value of the municipal water distribution and reconciliation infrastructure is not known.

Investment projects in the water sector

Infrastructure investment in the water sector can be grouped into three categories: water resources, regional bulk water services, and local water services infrastructure.

Water resources infrastructure

A number of bulk water infrastructure developments are currently taking place in South Africa. Of prominence is the Trans-Caledon Tunnel Authority (TCTA), the state-owned entity established for the implementation, operation and maintenance of the project works within South Africa, according to the treaty that governs the Lesotho Highlands Water Projects (LHWP). TCTA finances and oversees the development of bulk raw water infrastructure and the following facts are pertinent in relation to new investments.

Projects that are currently being implemented have a capital allocation of R9.9 billion, of which 52% is for the Olifants River Water Resources Development Project (ORWRDP). The total funding required to implement the new mandated projects is estimated to be R14.2 billion, of which 32% will be funded by Development Financial Institutions (DFIs), and 18% by commercial banks. According to the budgeted capital expenditure, the bulk of expenditure will take place during the 2014/15 financial year.

Regional bulk water services infrastructure

South Africa's regional bulk infrastructure policy was initiated in February 2007 and launched in March of the same year. The DWA is responsible for the management of the regional bulk infrastructure fund for water services. Funding is channelled through the Regional Bulk Infrastructure Grant (RBIG).

Apart from the uniqueness of the funding structure, projects must be 'implementation ready', meaning that feasibility planning must have been undertaken. It is also required that projects are aligned with regional and national water resource development strategies and comply with water conservation and demand management objectives. Since its inception and in its third year of implementation, expenditure on the programme has been R1.3 billion.

A review of the current implementation and funding requirements reveals the following:

- Expenditure 2007–2011:
  - Capital – R1.4 billion
  - Feasibility/Implementation Readiness Studies (F/IRS) – R55 million
- Budget requirement for 2011–2012:
  - Capital – R1.65 billion
  - F/IRS – R89 million
- Total expenditure up to December 2011:
  - Capital – R604 million or 35% of current budget
  - F/IRS – 12% of current budget
- 2011–2018 project reviews reveal that:
  - 75 projects are in implementation/construction: R15.5 billion
  - 76 projects in F/IRS: R9 billion

Local water services (municipal) infrastructure

A recent report (CoGTA, 2010) assessed the need for water and sanitation infrastructure in municipalities, which is summarised in Figures 47 and 48. The key findings in relation to investment in the water sector are:

- In the KwaZulu-Natal and North West provinces, the need for investment in water reticulation is the most urgent priority, while the need for investment in bulk infrastructure is a priority in the Eastern Cape, Free State, Mpumalanga and Northern Cape provinces. In the Western Cape, both bulk infrastructure and refurbishment are priorities.
- A total budget of R62 billion is required to tackle backlogs in reticulation infrastructure, including refurbishment, bulk infrastructure, and treatment infrastructure. Internal bulk infrastructure requires the highest proportion of this allocation (36%), followed by reticulation (33%), refurbishment (18%) and waste water treatment (13%).
- The total sanitation infrastructure investment required is R73 billion, of which wastewater treatment works (WWTW) account for 26% and sanitation 47%. The sanitation refurbishment budget accounts for 11% of the total budget, and bulk sanitation infrastructure for 16%.

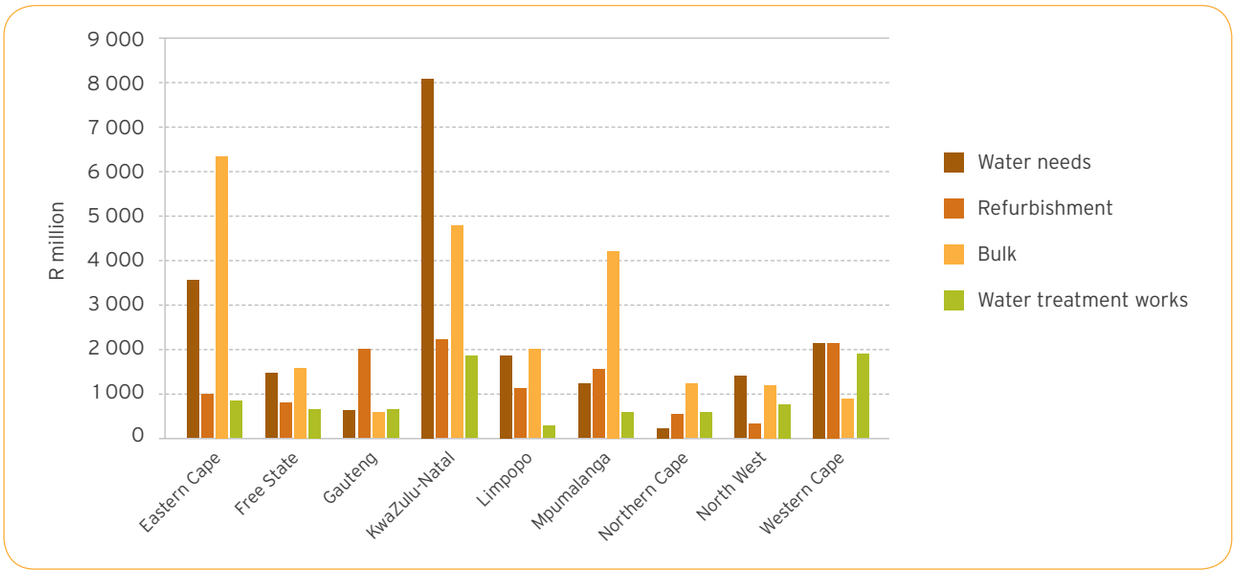


Figure 47: Total water investment needs

Source: Department of Cooperative Governance & Traditional Affairs (2010)

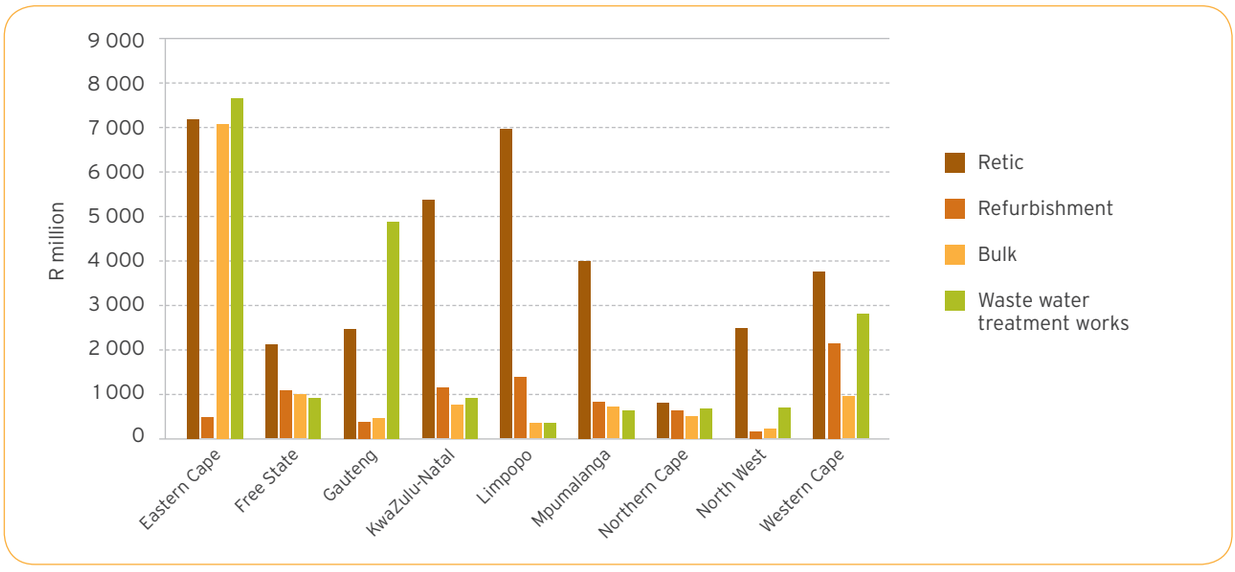


Figure 48: Total sanitation needs

Source: Department of Cooperative Governance & Traditional Affairs (2010)

Institutions in the water sector

Local stakeholder institutions in the water sector include the government and its agencies, the private sector, non-government organisations and professional bodies. The government has the following roles and responsibilities:

- The Department of Water Affairs is responsible for oversight of the sector at both the national and regional levels.
- TCTA is a government agency that implements bulk raw water infrastructure programmes on behalf of the DWA.
- The Water Research Commission is a DWA agency tasked with supporting and promoting research and development in the water sector.
- The Council for Scientific and Industrial Research (CSIR) is a government agency that *inter alia* conducts research and development in the water sector.
- Water Boards are DWA agencies that deliver bulk water services to local and district municipalities on a regional scale.

Private sector stakeholders are concentrated in the consulting and contracting industries, which are too numerous to disaggregate. The consulting industry undertakes development activities with respect to planning, feasibility studies, design activities and monitoring of construction. Contractors build the infrastructure.

Non-governmental organisations (NGOs) play a role in terms of community water projects. The Mvula Trust is the largest and most prominent NGO in Africa. Of the professional bodies, the Water Institution of Southern Africa (WISA) is the most prominent. It promotes knowledge sharing through conferences, seminars, workshops and facilitating training programmes. Table 30 summarises the functions of the various institutions that manage the water sector.

Table 30: Functions of the various water institutions in South Africa

Water Institution	Function
Department of Water Affairs (DWA)	Sector overseer, mainly playing a regulatory role and implementing strategic programmes, with the help of provincial/regional offices.
Catchment Management Agencies (CMAs)	Managing water resources at catchment and water management area (WMA) level, and at provincial level.
Water Services Authorities (WSAs)	Municipalities empowered to ensure delivery of water services (local government).
Water Services Providers (WSPs)	Provide water services to WSAs who do not have the capacity to do so themselves at local level.
Water User Associations (WUA) (from Irrigation Boards)	Associations of water users operating within a given allocation of water at local level.
Water Boards	Financially independent DWA agencies providing bulk water services at local and regional levels.
Water Research Commission (WRC)	A national water-related research institution that funds and coordinates sector research activities.
Trans-Caledon Tunnel Authority (TCTA)	An agent of the DWA implementing the development of mega water resources infrastructure of regional and international magnitude.
National Water Resources infrastructure Branch (NWRIB)	A branch of the DWA that manages the development of local bulk water resources and service infrastructure in selected areas.
National Water Resources Infrastructure Agency (NWRIA) (yet to be established)	Establishment of this agency will see a phased integration of the NWRIB and the TCTA to handle the financing, construction and management of mega water resource infrastructure; and will raise investment funds on the capital market, supplemented by the DWA's budget; extra costs are envisaged for 'social investment' requirements.

Finance for water infrastructure development

Funding for bulk water resources infrastructure is largely commercial as it is driven by industrial/commercial demand for water. Where such projects include water supply for social needs, government grants are used to fund the social components. The government also supports the development of water resources infrastructure for domestic water supply where commercial options are not viable.

For municipal expenditure, the main sources of funding are inter-governmental grants (51%), own sources (30% – local taxes and surpluses) and borrowing (19%). Dependency on grants has deepened as most municipalities have neither the capacity to borrow nor the revenue base to meet recurrent costs. The primary source of grant funding is the Municipal Infrastructure Grant (MIG), which has been augmented by the Regional Bulk Infrastructure Grant (RBIG) implemented in 2007. The RBIG is not formula based. It is project focused and hence each case is assessed and selected on merit. Due to the unique nature of the RBIG, co-funding from both the social and economic sectors is required as regional bulk serves both sectors.

Critically, widespread non-compliance with Infrastructure Asset Management (IAM) best practices results in funds that are allocated to new infrastructure investment, being used for unplanned repairs and replacements Furthermore, in many municipalities, budgeted revenues are seldom achieved due to an entrenched culture of non-payment.

The 2008 Local Government Expenditure and Budget Review highlights consumer debt as one of four key areas of concern. Other areas of concern highlighted in the review include the following:

- Increasing government transfers to municipalities compared to own revenue, is creating grant dependence which cannot sustainably fund operating costs. The equitable share constituted 8.6% of total operating revenue in 2003/04 which rose to an estimated 17.5% in 2007/08.
- There is inadequate expenditure on repairs and maintenance, which is attributed to the ease with which such expenditure can be deferred in favour of new capital projects or other operating costs.
- Water services are generally under-priced, partly due to over-reliance on national grants. This is true even in cases where such services have the potential to finance themselves. There is also a huge disparity in the ability of rural municipalities to generate income relative to their urban peers.

Challenges in the water sector

Challenges in the water sector have been assessed and reviewed over many years. The scale and causes of these challenges are therefore well understood. The problems are, however, complex and difficult to resolve. Indeed, high variability in the natural water cycle, and the central role that water plays in social and economic development and environmental sustainability, requires robust investment frameworks, planning and risk management to ensure water security.

Figure 49 illustrates the current challenges in the water sector value chain (in orange) and indicates the key stakeholders responsible for addressing them.

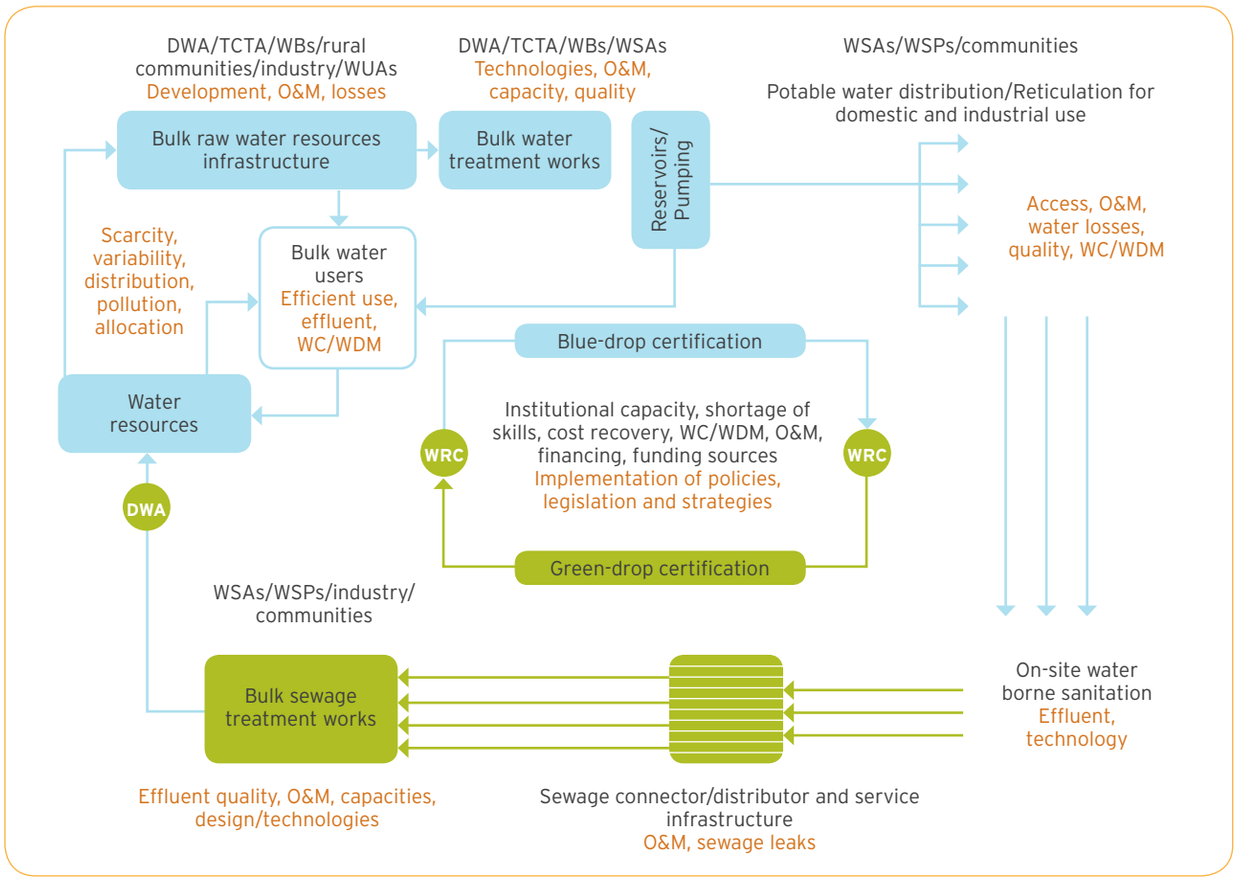


Figure 49: The water sector value chain, its stakeholders[11] and issues

Source: Author's own diagram (2011)

From Figure 49 it can be deduced that there is a wide range of challenges in the provision of water for social and economic purposes. From a policy perspective, these must be systematically addressed over time. Table 31 summarises the ten key challenges in the water sector.

11 DWA – Department of Water Affairs; TCTA – Trans-Caledon Tunnel Authority; WBs – Water Boards; WSA – Water Services Authority; WSP – Water Services Providers; WRC – Water Research Commission; O&M – Operational & Maintenance

Table 31: Top 10 water sector issues and challenges

Issue	Challenges
1. Weak and/or poor institutional frameworks (management and governance)	Strengthening and/or reforming water institutional frameworks to ensure strong and integrated management and governance structures to, among other things, ensure understanding of roles and responsibilities.
2. Lack of adequate funding, poor application of funds and/or lack of appropriate funding options and financing structures	Ensuring adequate funding and financing mechanisms for water sector projects supported by appropriate institutional frameworks.
3. Shortage of operational and management skills	Development and implementation (financing) of skills development and capacity building programmes for the water sector that align with international best practice.
4. Pollution of water resources by human activities, especially poorly operated and maintained wastewater treatment works and industrial effluents	Managing and preventing the pollution of water resources through appropriate regulation for domestic, industrial and agricultural activities; management of effluent from mining activities (acid mine drainage); and agriculture in some areas is posing immense challenges.
5. Poor water conservation and demand management across the entire water sector value chain, leading to high water losses	Institutionalisation of the implementation of water conservation and water demand management measures to ensure the allocation of dedicated resources for their implementation and integration in all infrastructure developments. Such institutionalisation can also enhance the capacity of water services providers to prepare WC/WDM bankable projects that can attract funding (especially with respect to dealing with water losses).
6. Poor operation and maintenance of infrastructure	Development and implementation of best practice asset management programmes (which are budgeted for), for the optimal operation and maintenance of existing water resources and services infrastructure.
7. Rehabilitation and/or upgrading of infrastructure	Development of funding/financing mechanisms for rehabilitation programmes given that some of the infrastructure was initially constructed without consideration of the need for maintenance funding.
8. Resources management and development (water mix) in an environment of scarce water resources	Implementation of water allocation and processing of licences on time under conditions of constrained technical capacity; exploitation of alternative water sources (and conventional surface water where the potential exists); development of bulk infrastructure that promotes economies of scale.
9. Poor domestic water quality management	Ensuring the provision of potable, safe domestic water, especially for drinking.
10. Provision of or access to water services, especially in rural and unplanned settlements where unemployment and poverty levels are high	Addressing water services backlogs, i.e. lack of access to water services infrastructure, in poor and rural areas where cost recovery is difficult or impossible and reticulation infrastructure expensive to roll out.

Source: Godfrey Mwiinga, DBSA (2011)

Figure 50 illustrates the extent and seriousness of the issue of water losses and hence the importance of prioritising the implementation of water conservation and water demand management measures as matters of urgency.

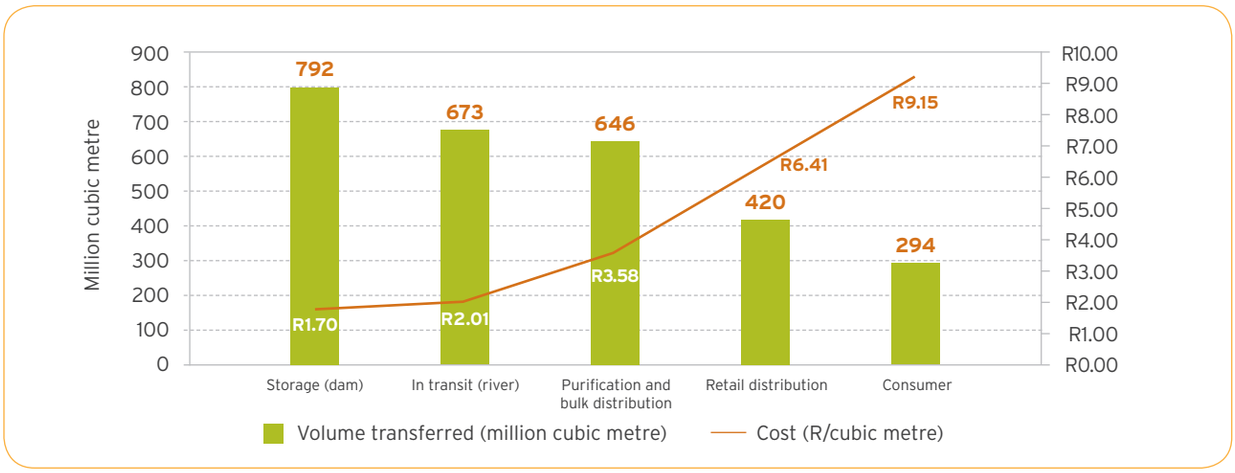


Figure 50: Water losses and inefficiencies in a typical SA water value chain

Source: Trans-Caledon Tunnel Authority (2011)

The mining, energy and agricultural sectors face particular challenges with respect to dealing with water allocation, licensing issues and the pollution of water resources. The agricultural sector is characterised by high water losses due to inefficient irrigation systems.

Overall, there are distinct institutional problems in both the water resources and water services sectors. The water resources sector has struggled with the establishment of functional catchment management agencies to ensure integrated development, management and protection of water resources. In terms of water services, the main institutional problem is the capacity of water services authorities to deliver water services. Furthermore, the entire water sector confronts challenges with respect to the roles and responsibilities of the various delivery institutions, as well as their coordination. The problem of skills shortages is common to both water resources and water services, but they are particularly critical in water services, where the interface with consumers occurs.

Figure 51 illustrates the linkages between the overall and cross-cutting water sector challenges, and their specific issues.

Accessing funding (challenge No. 2) is directly linked to municipalities being characterised by low pricing and poor regulation from national government with respect to monitoring cost-recovery tariffs. There are some challenges which, although requiring urgent attention, can be resolved in the short term. For instance, water conservation and demand management (challenge No. 5) includes the need to control water losses. If effectively addressed, this can provide benefits within a short period of time and can further support efforts to address the other challenges.

Furthermore, Figure 51 illustrates the centrality of institutional frameworks in addressing all the challenges in the sector. It also shows that being able to provide water services to areas in need requires resolution of the institutional challenges identified.

Policy recommendations

The issues and challenges that face South Africa's water sector infrastructure are largely the consequence of weak institutional structures at both national and local government levels. Strong institutional structures facilitate retention of critical skills essential for good management, effective operation and sustainable maintenance of infrastructure. In the establishment of such institutional structures, strong political leadership is required. It must be noted, however, that addressing institutional issues cannot be achieved in the short term. There are, however, some immediate actions that are required to address issues that can be resolved in the short to medium term:

- Address the problem of high levels of non-revenue water, which includes both physical water losses as a result of poor maintenance of infrastructure and losses due to poor billing and revenue collection;
- Deal with maintenance backlogs to ensure that infrastructure operations are at optimal capacity for effective utilisation, thus preventing the need to build unnecessary extra capacity. Although it is common cause that it is much more expensive to replace infrastructure than to maintain it, this principle has not been applied;

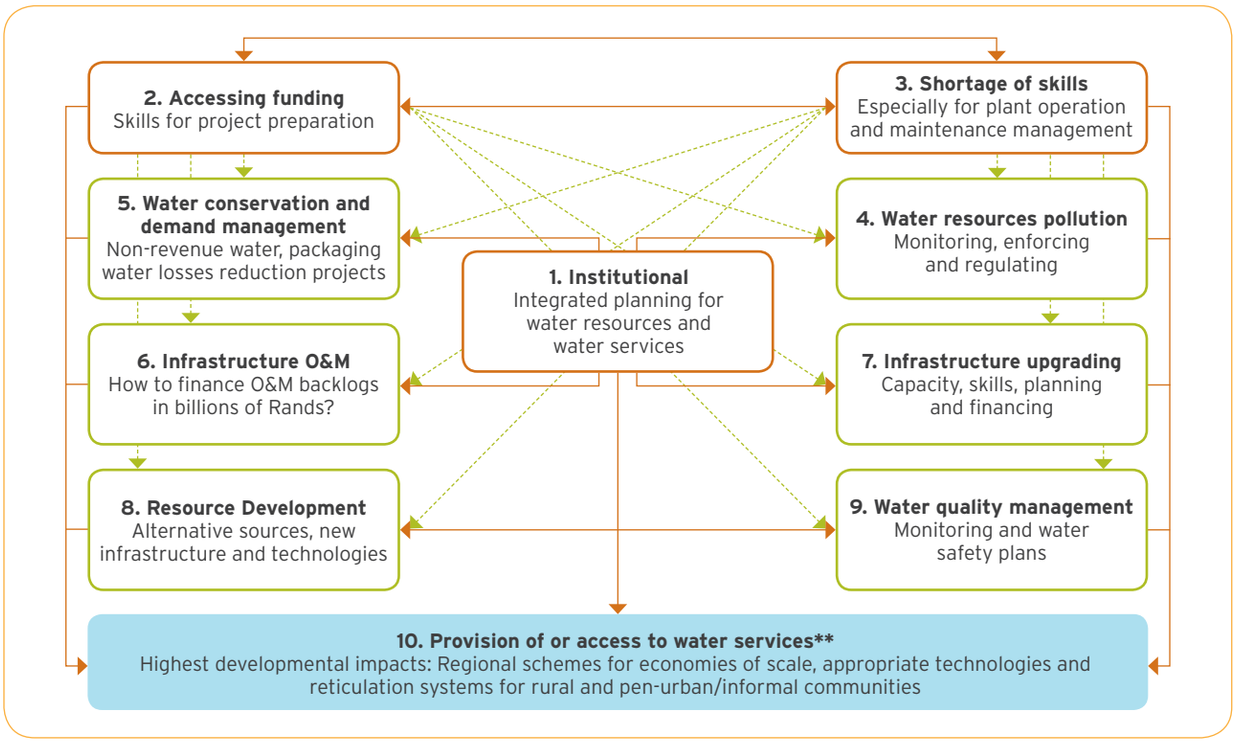


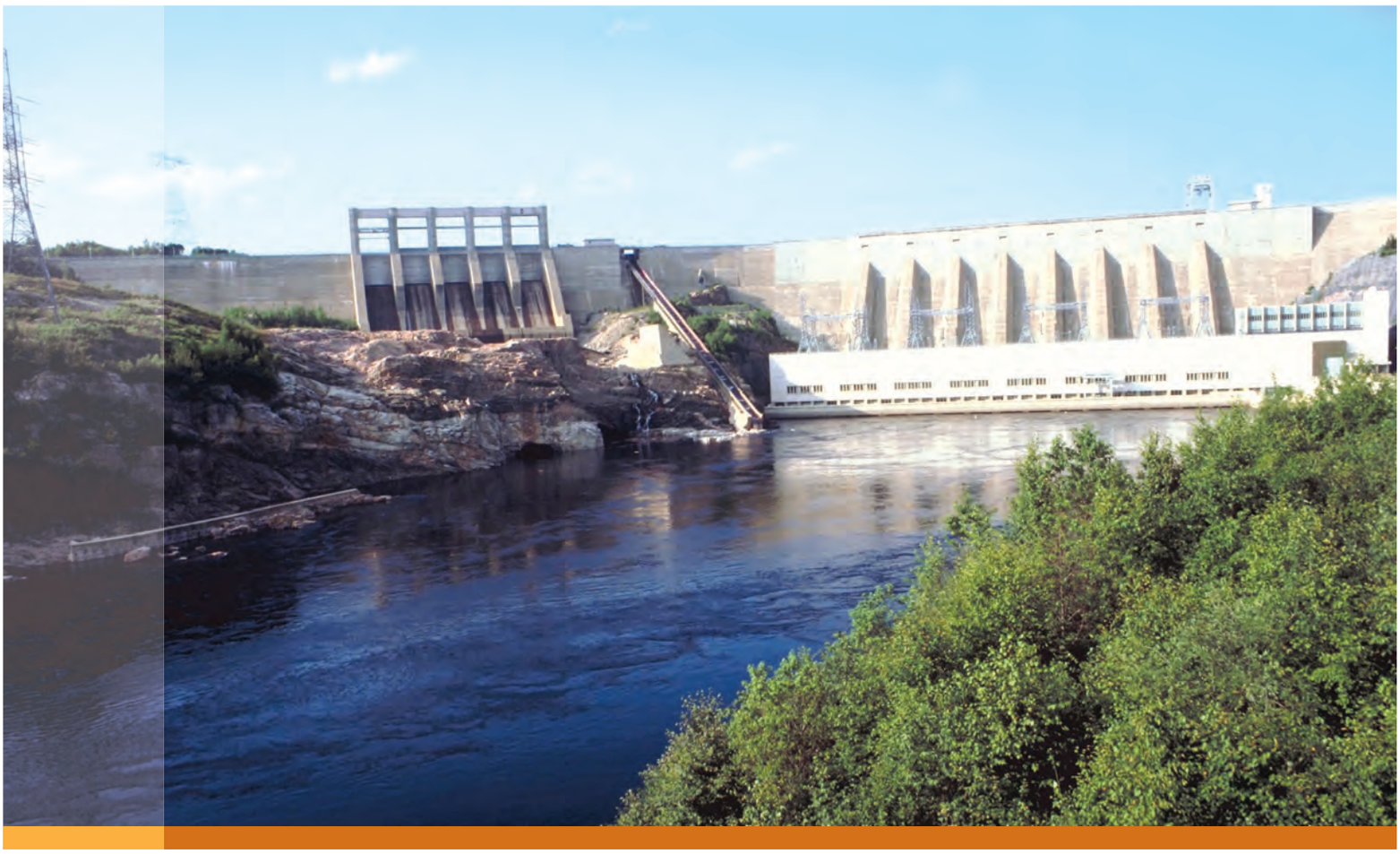
Figure 51: Inter-dependence among the top ten water sector challenges
Source: Godfrey Mwiinga, DBSA (2011)

- Rehabilitate sewerage infrastructure (especially wastewater treatment works) that is polluting the environment and threatening the quality of water resources;
- Enhance the regulation of water quality and protection of the environmental reserves as they are the key drivers of effective infrastructure development and maintenance;
- Having acknowledged the capacity constraints in municipalities, it is recommended that this problem be addressed by a strong drive to roll out public-private partnerships that are performance based; and
- Implement coherent water pricing and regulation across the entire water value chain.

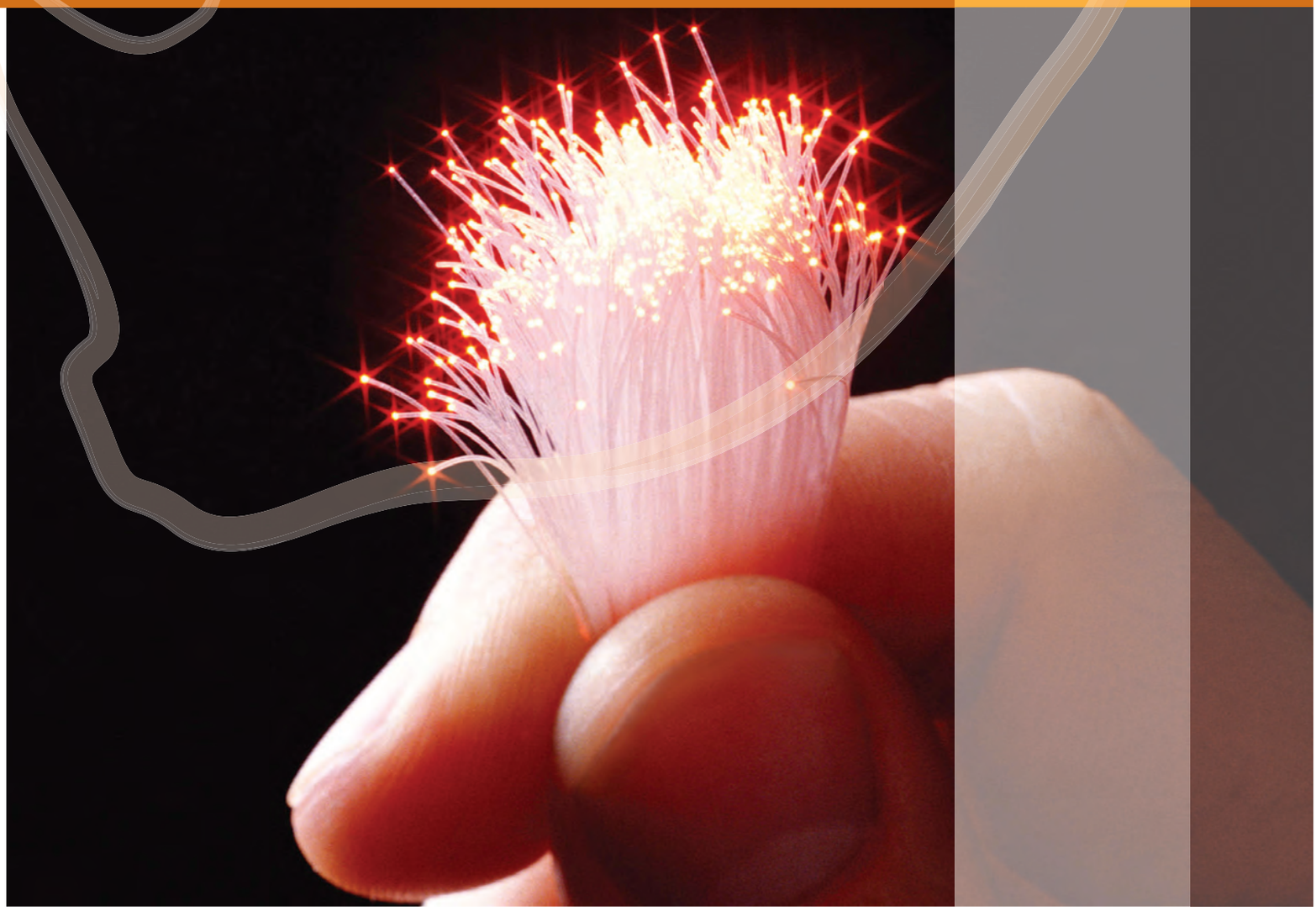
Another central lesson from policy experience is that the under-pricing of water has undermined maintenance of infrastructure, as well as the protection of water resources. Low prices have led to institutions not receiving the revenues they need, water being inefficiently used, and wastage occurring. Furthermore, there are no consequences for those who pollute water (private and public, individual and institutional), creating serious damage to public health and the environment, alongside imposing clean-up costs on others.

Getting prices 'right' is not a simple matter – central government, for instance, has no authority over prices set by local government, and in a country with such large income disparities, consideration has to be given to the capacity of low-income households to pay for services.

In terms of planning, the implementation of water policies has privileged short-term gains over long-term sustainability, primarily because the overarching objective has been to fast track access to water services for the previously marginalised majority. The time has now come to ensure that systems are in place to secure long-term water supply, deliver water services, and recover outstanding debt from those who have not paid, in order to ensure that lack of revenue does not undermine maintenance and other critical operational processes. Above all, prices paid for water must reflect the reality that water is scarce and difficult to manage, and must reflect costs, allow for future development and supply, and regulation must ensure there is no wastage of resources across the value chain.



7 Telecommunications: Fibre Projects



Current regulatory obstacles, including ownership rules, hinder the expansion of telecommunications infrastructure, which in turn constrains economic growth and development

Unlike the other five sectors reviewed in this report, telecommunications is dominated by the private sector, although government exercises significant influence over this sector through national policy and regulation. While information and communication technology are inextricably linked, this section focuses on fibre projects as they are the technology of the future.

Industry overview

There are two systems of digital access in South Africa: the Internet and mobile systems. Until three years ago, these were distinct, and in some ways defined the digital divide in South Africa. Due to the fundamental human need for communication, and the aggressive marketing of mobile communications, funded by high profit margins accumulated by the networks, mobile technologies became pervasive in South Africa by 2008.

At that stage internet access was still confined to the upper economic segments of society, and growth in the internet user base was well below 10% for most of the decade. Hence, by 2008, penetration was also below 10%. This seeming contradiction between saturation of mobile devices among the adult population and only one in ten South Africans having internet access underlined both the opportunity and the gap in digital access provision in South Africa.

At present, the South African telecommunications sector is in a decisive stage of broadband evolution. Aside from the incumbent fixed-line provider (Telkom), which has been developing its network for several decades, all telecommunications operators in the country are presently investing heavily in new infrastructure. The mobile networks, in particular, are unable to keep up with the demand for their services.

The rapid growth in the uptake and usage of mobile broadband makes great demands on the wireless spectrum, which in turn has to be supplied with 'backhaul' through fibre optic networks[12]. However, even the fastest mobile broadband service is not as reliable as a moderately fast fixed-line service supplied through ADSL, but because the ADSL backbone network is only available from one provider, pricing is uncompetitive, and supply is limited. As a result, mobile broadband subscriptions overtook fixed-line broadband in 2008, as illustrated in Figure 52.

With local loop unbundling that was due by the end of 2011, all telecommunications companies will have a right to access the exchange infrastructure owned by Telkom, and to roll out fixed-line services to consumers. However, many will choose to utilise only fibre infrastructure, and offer fibre-to-the-home and fibre-to-the-office services to high-end customers.

The initial cost of fibre is exceptionally high, but once installed, the marginal cost of service is low, while the potential quality of service is exceptionally high. The typical speed offered by fibre to the customer is 100 Megabits per second (Mbps), compared to ADSL's current maximum of 10 Mbps. As a result, fibre is already being installed in new office parks and, to a lesser extent, in new residential developments.

Fibre optic cables therefore provide the backbone for both the present mobile broadband networks and for future connections that will bring rapid, reliable and high quality broadband access.

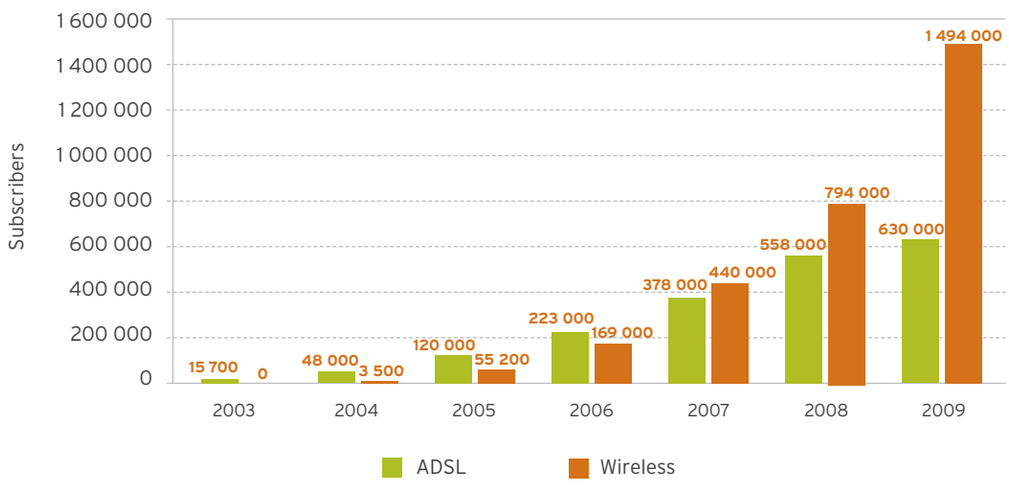


Figure 52: ADSL vs wireless broadband in South Africa 2003–2009
Source: World Wide Worx (2010)

12 In a hierarchical telecommunications network the backhaul portion of the network comprises the intermediate links between the core network, or backbone, of the network and the small sub-networks at the 'edge' of the entire hierarchical network. For example, while cell phones communicating with a single cell tower constitute a local sub-network, the connection between the cell tower and the rest of the world begins with a backhaul link to the core of the telephone company's network (via a point of presence).

For this reason, this chapter on the status of infrastructure in the telecommunications sector focuses on fibre optic cable infrastructure.

Institutional issues

Throughout much of the last decade, demands on the government to liberalise telecommunications tended to go unheeded. This was partly a result of poor resourcing of the regulator, Independent Communications Authority of South Africa (ICASA), which in turn has resulted in legislation not being effectively implemented and regulatory capacity in general remaining poor.

In September 2004 – as part of a determination on amendments to the Telecommunications Act (Government of RSA, 1996, 1997) – it was announced that value-added network services (VANS) would be permitted to provide their own network facilities from 1 February 2005. The regulator, ICASA, formally endorsed this amendment. The Minister, however, subsequently stated that this self-provisioning applied only to mobile cellular operators and that value-added network operators could only obtain facilities from licensed operators. In effect, competition was stifled, because VANS were forced to buy all network services from the same companies that were their biggest competitors; this became a major constraint to a competitive broadband industry.

Two events alleviated this constraint. The first was a court victory on 29 August 2008 by Altech Autopage against ICASA, which essentially forced ICASA to issue a new category of telecommunications licences to anyone who applied, rather than picking a select handful. The Electronic Communications Act envisages that these ECNS (Electronic Communications Network Services) or i-ECNS (individual ECNS) licences would eventually allow their holders to provide any communications service, from Internet to phone to broadcasting, as the technology underpinning these services is all moving to a common platform, namely the Internet Protocol.

The High Court ruled that value-added network services (VANS) must be allowed to provide their own networks – and that the regulator is obliged to grant the appropriate licence to any network that chooses to do so. Consequently, on 19 January 2009, 419 VANS were granted ECNS licences.

The second event was the decision by the Department of Communications to rescind its decision that the SEACOM undersea cable should have majority government shareholding. As a result, the commercial Internet landscape shifted more dramatically than it had since it emerged in South Africa in 1993-94. Investment in infrastructure, start-up companies and marketing campaigns intensified. As a result, 2008 saw the beginning of a sharp rise in the number of Internet users in South Africa.

In 2010, another fundamental shift occurred. The number of smartphones sold in South Africa reached a critical mass, with more than 5 million in use. This helped to fuel an explosion in mobile Internet access in South Africa. This trend will continue as smartphone penetration intensifies. Indeed, it is projected that by 2013, more smartphones than normal phones will be sold in South Africa (Pienaar, 2010). By 2014, it is possible that the Internet user base will reach 10 million, accounting for more than 20% of the population.

This most visible symbol of the crossing of the digital divide is fuelled not by specific efforts to do so, but by the converging of two separate industries, namely the mobile and the Internet industries, with the first now being the major driver for the expansion of the second. A decade ago, this could not have been possible.

In many ways, failure to liberalise was a catalyst for exactly the developments that liberalisation was meant to allow. When policy makers and regulators tried to hold back newcomers and new technologies, the industry finally rebelled and began looking for alternative approaches, including court challenges and establishing consortia like SEACOM and Dark Fibre Africa. The latter made possible the partnerships between Neotel, MTN and Vodacom to share trenching infrastructure for national fibre grids. These partnerships, in turn, form the backbone for the expansion of data networks in South Africa, as well as new ones that further expand the fibre and mobile networks, such as the FibreCo joint venture between Cell C, Internet Solutions and Convergence Partners.

Despite these developments, the regulator's lack of capacity for expediting the regulatory process remains a bottleneck in certain areas. In particular, the allocation of wireless spectrum remains an issue: Telkom and Sentech have been allocated substantial spectrum that has never been used. At the same time, ICASA has failed to conduct a long-promised auction for WiMAX spectrum – three years after a number of Internet service providers successfully tested their networks and applied for licences.

A critical issue for Internet service providers is that Sentech – which has a core role in signal distribution for broadcast services in South Africa – continues to be regarded by some arms of the government as a potential provider of broadband services. While Sentech has exited the consumer sector, where it failed to reach even 10 000 customers after investing hundreds of millions of rands, it is now positioned as provider to under-serviced areas, schools, clinics and the like. To be successful in this endeavour, Sentech would need to deliberately ignore its delivery track record; however there is general consensus in the industry that Sentech should be confined to its signal distribution role.

Finally, the expansion of the industry is hampered by the lack of cohesion between national, provincial and local authority in terms of trenching permissions, policies and coordination. Most municipalities do not even have a trenching policy, and hence give permission to any entity that applies. This results in duplication of trenching and ongoing disruption of roads, pavements and general traffic and pedestrian activity.

Utilisation of existing infrastructure

The final piece of the institutional puzzle that has not yet fallen into place is Local Loop Unbundling (LLU). Set for November 2011, as mentioned above, it is intended to give all telecommunications companies access to the exchange infrastructure owned by Telkom, and the copper line infrastructure already in the ground, in order to roll out fixed-line services to consumers.

While there is a widespread belief that fibre has overtaken the benefits of fixed-line technology, the sheer scale of copper infrastructure makes it a compelling opportunity. With 140 000 km of fibre optic cable connecting exchanges, the copper lines running from these exchanges into residential and business areas amount to millions of kilometres. Fibre cannot compete with this scale for many years to come. This single factor emphasises the importance of Telkom's monopoly on the local loop, and its effect on competiveness in the telecommunications sector.

Figure 53 summarises broadband subscriber numbers per network/technology. It reveals how powerfully 3G has grown in South Africa, while ADSL growth has been relatively stagnant (World Wide Worx, ongoing research).

The total subscriber base for 3G wireless broadband is 2.7 million – almost four times that of the ADSL base – despite ADSL being more reliable and, until recently, cheaper. ADSL penetration rates have been curtailed by falling fixed-line subscriber numbers and Telkom's withdrawal of service from whole areas due to theft of copper cable.

Aside from specific broadband subscriptions, access can also be measured in terms of place of access, e.g. corporate, small and medium enterprises, and academic institutions. At this stage, such a disaggregation conflates forms of access and place of access, due to the difficulty of correlating the two.

Table 32, which summarises the number of users at the end of 2010, takes into account the fact that there is high cross-usage of ADSL and mobile broadband, but that ADSL will almost always be the primary form of access.

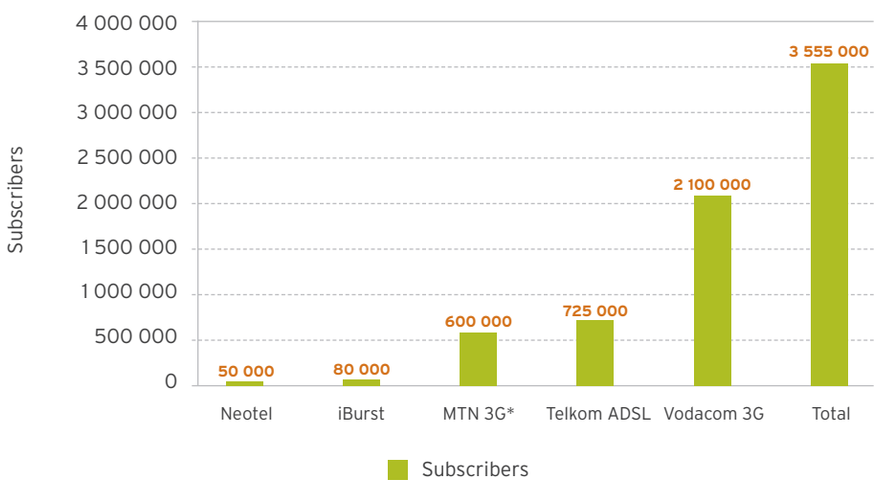


Figure 53: Broadband subscribers by service provider, 2010

*Source: World Wide Worx (2010) *Estimate*

Table 32: Internet access in South Africa at the end of 2010

Unique primary wireless b/b users	Primary ADSL users	Cellular only	Dial-up Internet users	Corporate users (adjusted for mobile b/b users)	SME users (through office ADSL)	Academic users	Total users
2 100 000	700 000	1 000 000	250 000	1 550 000	600 000	600 000	6 800 000

Source: World Wide Worx (2010)

Value of the Industry

Work by Abrahams and Goldstuck (2011) provides the following indicators as to the overall value of the industry. In 2009 they estimated that the communications sector contributed 5% to GDP. Between 2000 and 2008, investment in the sector grew by 14% per annum including investment in backbone networks, mobile infrastructure, broadband infrastructure, and pay TV. There is also a large revenue component from the export of mobile services by Vodacom and MTN to countries in Africa and the Middle East and by subscription TV provider DStv to countries in sub-Saharan Africa.

As revenue from the communications sector moves beyond income from voice traffic and becomes increasingly data driven, further investment and sector growth can be expected. However, sector growth is dependent on growth in other sectors such as financial services, wholesale and retail, hotels and restaurants and will fluctuate with national developments in these sectors.

South Africa's communications sector is also a significant exporter of services and thus earns a large revenue component from abroad. For example, Vodacom and MTN export mobile services to countries in Africa and the Middle East, and TV provider DStv exports subscriptions to countries in sub-Saharan Africa. It has been reported that MTN generated US$1 billion in revenue in Nigeria alone. As Africa's GDP has more than doubled over the last decade, this has generated increased revenue flows to South Africa and South African firms.

The IT market, led by multi-nationals like IBM, Cisco and Tata, alongside local companies like Dimension Data and arivia.kom, was valued at US$9.5 billion in 2010, in terms of revenue earned in the South African market. The industry has more than 2428 companies and a total workforce of 141 929 people operating across the hardware, software and IT services markets. Services include computer hardware sales and IT rentals, technology and information architecture, software design and applications integration, data management, hosting and email, web design and content management, and a range of value-added services.

Extent of infrastructure in South Africa

Africa's optical fibre network has increased from around 400 000 km in 2008 to 600 000 km in 2010. In the next two years, it is likely to increase by another 200 000 km. The strands of fibre optic cable are the easy part: the trenches present the most daunting obstacle to fibre roll-out. For this reason, most of MTN and Vodacom's urban networks run along trenches dug by independent infrastructure provider Dark Fibre Africa (DFA).

Outside the cities, Vodacom has joined forces with its fiercest rival, MTN, along with Neotel, to share the costs of digging the trenches that will host three separate national fibre grids. At present, a mere 20% of the cellular towers have the capacity they need for data, especially considering the anticipated demand in terms of smartphones and video growth.

The overarching challenge is the cost of using existing infrastructure. Two national grids have been in place for some time, and everyone is dependent on these. Telkom boasts a massive 140 000 km network, initially designed to link up exchanges as well as to provide backhaul to its microwave towers, and now the cellular towers that power 8ta, its mobile network. Around a quarter of that capacity is intended for customer access.

Alongside Telkom's infrastructure, Broadband Infraco, a state-owned enterprise, was created to house the national fibre grids previously operated by both Transtel (along their railway lines criss-crossing South Africa), and Ezi-tel (which managed the fibre network that ran alongside all Eskom power lines).

Finally, for now, there is the sixth prospective national grid, a collaboration between Cell C, Internet Solutions and Convergence Partners, under the banner of FibreCo. These networks link up with the DFA local grid as well as other regional initiatives. The cities of Cape Town and Durban already have municipal fibre grids in place that are becoming regional hubs. The City of Joburg has completed the first phase of its own network.

Simultaneously, small, new players are emerging to extend the reach of the urban grids on a suburban level, known in the industry as 'capillarity', referring to the capillaries of fibre strands that extend from the main fibre rings into suburbs or areas of high business density and demand. For example, MetroFibre is digging its own trenches, running them from the DFA grid to the front doors of its corporate clients. It rents capacity on the DFA network, effectively lighting up dark fibre that is already in the ground, and delivering this capacity to its clients (See description of the Dark Fibre Africa approach below). In Durban, i3 Africa is planning to do the same for businesses and households. These are largely Greenfield investments as there is no fibre to the premises in the targeted areas.

Fibre networks all depend on narrow trenches, typically up to 150mm wide and half a metre deep. In South African cities, these are cut into the asphalt and concrete of urban roads and sidewalks. In rural areas, they are cut into dirt, rock and even harder surfaces. The logistic demands are enormous. Indeed, South Africa's construction sector is inexperienced and inefficient with respect to the roll out of fibre networks.

A further complexity is that much of the fibre being laid down at present is FTT: Fibre to the tower, which still focuses on providing backhaul for mobile broadband and other wireless demand. This reveals the fallacy of a current debate regarding wireless broadband being superior to fibre: the one can exist without the other. South Africa is at least three years away from hooking up all the towers, mainly because tower density is constantly increasing. In future, more sharing, swop-out and interoperability needs to occur between companies if telecommunications infrastructure is to expand.

Investment in fibre infrastructure projects

Industry sources have identified at least ten current or proposed major fibre infrastructure investments across South Africa. These are summarised in Table 33.

Table 33: Major fibre infrastructure investments

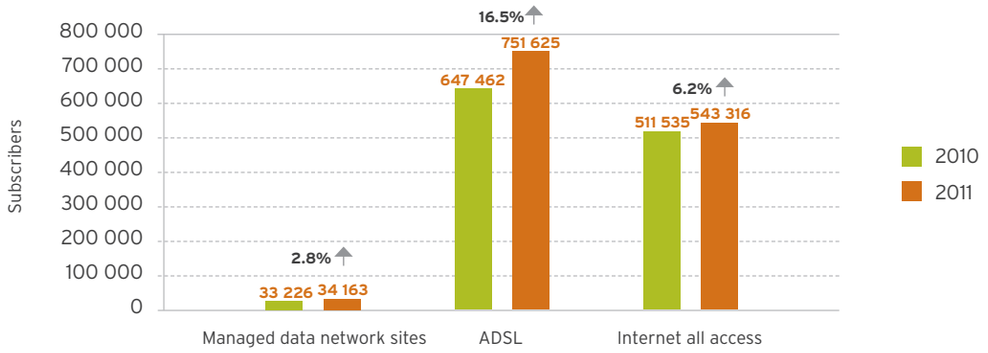
Organisation	Scope	Coverage
Telkom	The major national grid, covering 140,000 km	National
Broadband Infraco	The former Transtel/Ezi-tel national grid	National
Dark Fibre Africa	Laying down fibre to resell capacity to tele-communications companies	Urban centres
FibreCo	National grid between major urban centres	National
Neotel/MTN/Vodacom	National grid between major urban centres	National
City of Cape Town	Urban grid extending to Western Cape province	Municipal
eThekwini	Urban grid	Municipal
City of Joburg	Urban grid	Municipal
MetroFibre	Extends DFA network to customer premises	Urban – Johannesburg
i3 Africa	Extends eThekwini network to customer premises	Urban – Durban

The scope and nature of these investments are elaborated upon below.

Telkom

While Telkom does not provide maps showing its fibre network coverage, its briefings indicate that its network is pervasive on three levels: as a national grid, as a regional provincial grid, and as an urban grid. It has deployed 140 000 km of optical fibre, of which 23% lies in the access network, i.e. intended for access by customers. It is currently upgrading all exchanges to the maximum speed of current ADSL technology, namely 10Mbps, although it is believed that the next generation of this technology, ADSL2, can double this theoretical limit.

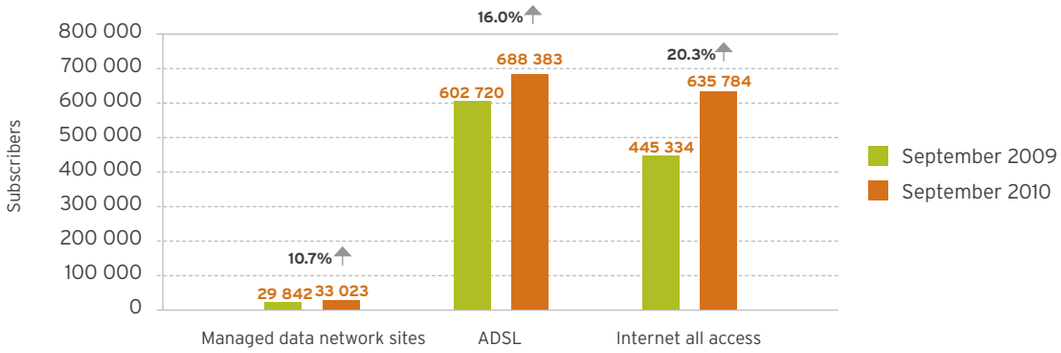
Figure 54 and 55, drawn from Telkom's 2011 Annual Report, illustrates the contribution made by data services to Telkom's revenues. While the focus tends to be on the number of subscribers at a consumer level, as the diagram shows, this is only a small proportion of overall data revenues. Leased line facilities, extensions of Telkom's grid to business customers, generate more revenue than Internet access itself. However, the contribution of data connectivity, which provides the data capacity that feeds the access network, remains the largest contributor.



Data annuity revenue (Rm)	2010	2011	%
Data connectivity	5 097	5 324	4.5
Leased line facilities	2 008	2 182	8.7
Internet access and related services	1 721	1 816	5.5
Managed data network services	1 033	1 242	20.2
Multimedia services	71	135	90.1
Total data annuity revenue	**9 930**	**10 699**	**7.7**

Figure 54: Telkom's revenues from data sources, 2010/11

Source: Telkom Group Integrated Annual Report (2011)



Data annuity revenue (Rm)	September 2009	September 2010	%
Data connectivity	2 477	2 707	9.3
Leased line facilities	983	1 116	13.5
Internet access and related services	869	986	13.5
Managed data network services	467	641	37.3
Multimedia services	34	100	194.1
Total data annuity revenue	**4 830**	**5 550**	**14.9**

Figure 55: Total data annuity revenue
Source: Telkom Group Interim Results (2010)

The significance of these figures lies in the slow growth of data connectivity – only 4.5%, compared to 30–50% growth for comparable revenues from other networks. Telkom's interim results at the end of September 2010 showed 9% growth over the previous comparable period, suggesting growth is slowing further (Telkom, 2010).

These figures suggest that, while Telkom has been highly effective in rolling out its network, it has not been as successful in extending it to the end user. Despite its substantial potential as a provider of broadband services to all end users, Telkom has not operated with a competitive ethos, and has pursued monopoly rents at the expense of expanding its network. The stark reality is, however, that Telkom remains the potential backbone of a national broadband framework.

Broadband Infraco

Broadband Infraco is made up largely of the former networks of the state utilities Transnet and Eskom, which functioned under the names Transtel and Ezi-tel. These were intended to be part of, but in the end were not incorporated into, the Second Network Operator (SNO), which became Neotel. Instead, the Department of Public Enterprises (DPE) announced that it would house these networks in a separate vehicle intended to lower the cost of broadband access by the end user.

Management of the network is, however, outsourced to Neotel, which is also Broadband Infraco's only customer since it was established in 2010. Since the Transtel lines run along most railway lines in the country, and the Ezi-tel lines along most Eskom power lines, this makes Broadband Infraco's the most pervasive grid in the country after that of Telkom, as illustrated in Figure 56.

The infrastructure depicted comprises 11 765 km of optical transmission links and 137 long-distance sites, with regional connectivity to three neighbouring states (Broadband Infraco, 2009).

In addition, "[T]he transmission capacity of the Broadband Infraco network was expanded by 33% during the reporting period to meet the increased capacity requirements of Neotel. Furthermore, interconnects to Botswana and Mozambique were successfully completed, requiring the installation of an additional 105 kilometres of fibre network and associated long-distance repeater stations. The interconnections to Namibia and Zimbabwe are nearing completion, requiring the incorporation of an additional 350 kilometres of fibre network and the construction of three new repeater stations" (Broadband Infraco, 2009:7).

Significantly, the network has termination points in Yzerfontein and Mtunzini, the landing points of several major undersea cables. Yzerfontein houses the landing point for the West Africa Cable System, established by the DPE with Broadband Infraco as the main shareholder. Mtunzini hosts the landing points for two major undersea cables, namely Seacom (private, managed by Neotel) and EASSy (in which Telkom and MTN are both partners).

While Broadband Infraco's objective is not to compete in the South African market, internet service providers remain dubious about the definitions used in this positioning: "Broadband Infraco will not participate in those areas of the South African telecommunications market or value chain that are efficient and experience high levels of competition in terms of available services and pricing options. Broadband Infraco is a state-led intervention in the

Figure 56: Location of Broadband Infraco's grid

Source: Broadband Infraco (2011)

telecommunications sector that is intended to rapidly normalise market efficiency by increasing available capacity and lowering the cost of those parts of the network infrastructure that impede private sector development and innovation in telecommunications services and content offerings" (Broadband Infraco, 2009:2).

The company intends to adopt a "wholesale, carrier-of-carriers business model", focused mainly on serving the following market segments:

- ECNS licenced operators, including fixed and wireless operators, as well as ECNS licenced Internet service providers (ISPs) and metro network operators;
- ECS licenced service providers, large corporate customers, large government institutions and multinational operators; and
- Underserviced area licensees (USALs).

In terms of the future expansion of telecommunications infrastructure, BroadBand Infraco provides a potential 'glue' between the networks created by both national and local ISPs and other customers. Since it is not positioned as a competitor in the end-user market, it would not have the same limitations as Telkom in relation to being threatened by competitors having full access to its networks. Critically, its outsourced arrangement with Neotel should not prejudice other ISP clients.

By playing an open access role at the lowest possible cost, BroadBand Infraco provides a powerful resource to smaller ISPs who cannot fund their own national fibre roll-outs but may be able to run connectivity from the BroadBand Infraco network to local clients. That this has not yet occurred suggests organisational constraints may still be in place, which prevent it from achieving this objective. Constraints include industry issues, such as the confused role of a state owned enterprise that appears to be competing with private enterprise; and internal issues, such as allegations of mismanagement, changes in leadership, and uncertainty regarding future strategy and vision.

Dark Fibre Africa

Dark Fibre Africa (DFA) has been the most innovative entrant into the broadband industry in South Africa. Its strategy is to invest in the relatively expensive process of digging trenches and laying down ducts for fibre optic cable throughout South Africa's major urban areas. It then connects with the major undersea cables, as well as with the national grids of telecommunications network operators. The fibre in its own network remains 'dark' until a client requires it, whereupon it is 'lit up'. In this way, it is able to provide a 'virtual fibre' network to any telecommunications operator,

ISP or even corporate client. Where Broadband Infraco has the potential to be the national 'glue' for ISPs, DFA plays that role at an urban level.

While DFA's vision is national, its own network is deployed on a local level, apart from a cable that will run from the Seacom landing station in Mtunzini to Gauteng. The effect of such a cable is that a switching station in Gauteng effectively becomes the landing point for Seacom, and its full capacity becomes available in Johannesburg and Pretoria. Neotel plays a similar role with its own cable running from Mtunzini to Midrand.

Figure 57 illustrates the network that DFA intends to utilise. Only two elements are DFA routes, as shown in the information on their website (Dark Fibre Africa, 2011). Due to the interconnection with other providers, however, the grid shown on the map effectively becomes the grid available to DFA customers.

Clearly, the network as presented in Figure 57 is not yet ready, but will be in place in two to three years. Once these plans come to fruition, DFA, along with Broadband Infraco – subject to the latter resolving the internal issues discussed earlier – will form a powerful wholesale backbone for commercial broadband services throughout the country.

FibreCo

FibreCo was created "with the vision of developing a national open-access terrestrial fibre optic network as an answer to the need for long-haul transmission infrastructure to meet the nation's aspirations for world-class broadband connectivity" (FibreCo website). This vision arises from the view that there is a substantial gap in the provision of long-haul bandwidth. The project is a partnership between Convergence Partners Investments, Cell C and Internet Solutions.

FibreCo aspires to address the gap in the broadband industry to fund, deploy and manage a cost-effective high speed long-haul fibre network which will support the anticipated explosive growth in bandwidth requirements in South Africa in the future. The business model is to allow anchor tenants to effectively own fibre on the network in order to access the economic efficiencies inherent in

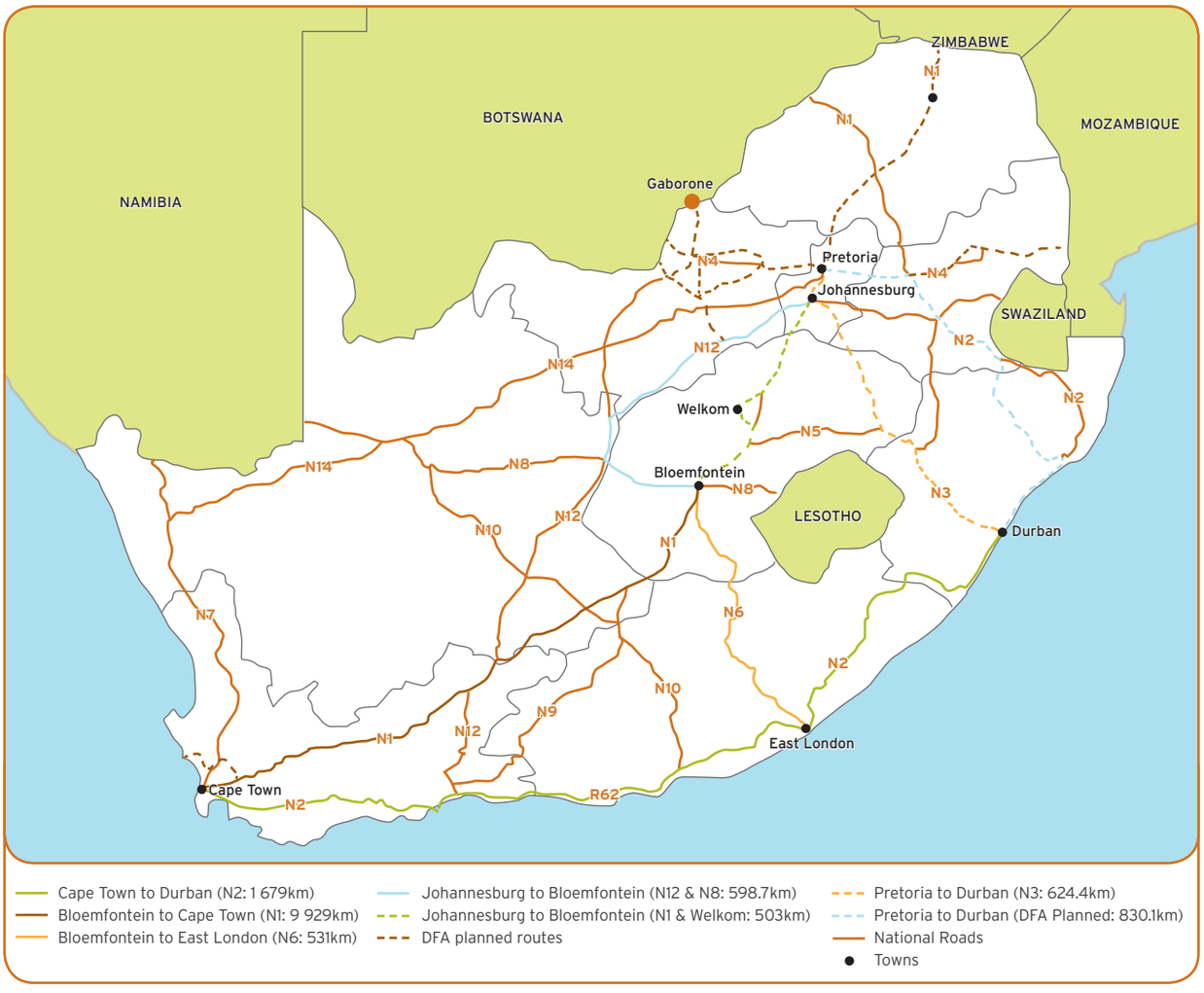


Figure 57: Network DFA aspires to utilise
Source: Dark Fibre Africa (2011)

fibre-optic networks, notably the ability to scale up the capacity being utilised by a factor of many orders of magnitude, with only a fractional increase in the costs of transmission (FibreCo website).

FibreCo is constructing a network that will ultimately cover a total distance of more than 12 000 km. It is being built in three phases: the initial phase will roll out 4500 km of redundant core ring linking Gauteng, Cape Town and Durban to international cable landing stations over two years. This phase will include 'drop-off sites' in cities the cable goes through, providing a redundant national ring, with connectivity to the undersea cable landing stations in Mtunzini, Melkbosstrand and Yzerfontein.

Phase two will bring additional routes to the Western Cape, Northern Cape, Limpopo and Mpumalanga, as well as to the borders to Botswana and Zimbabwe, while phase three will add new routes, enabling further resilience in connectivity to the coastal areas and increasing capillarity.

Once the FibreCo network is in place, it will provide highly effective competition to the other national networks, particularly given its open access model. This model is also compatible with the DFA model, consequently providing a fit on a national level to what DFA is doing at an urban level.

Neotel/MTN/Vodacom

In January 2009, Neotel and MTN announced that they would jointly invest in the cost of digging trenches and laying down ducts for 5000 km of fibre optic cable connecting South Africa's major cities. The joint venture is known as the National Long Distance (NLD) network.

Each operator will manage its own fibre and its own network within these ducts, but in effect the construction cost will be halved compared to undertaking these investments separately. In March 2009, Vodacom announced they were joining the construction consortium. Completion is expected in early 2012.

Figure 58 (illustrating the Neotel backbone that it originally leased via the Broadband Infraco infrastructure) is a good indication of the routes the NLD network intends to follow.

The duplication of part of the existing network used by Neotel makes it clear that the intention is to relieve the major operators from dependency on third party networks, namely Telkom and Broadband Infraco. The long-distance fibre optic network will require an investment of between R1.7 billion and R2 billion (Neotel and MTN, 2009). Notably, the fact that MTN has its own cable would save R200 million in operating costs in 2009 alone, with the figure set to rise once the whole cable is rolled out.

Figure 58: Neotel's broadband backbone, as an indicator of NLD's network routes
Source: Neotel (2011)

City of Cape Town

The City of Cape Town has been the most transparent of all the urban networks in terms of its roll-out, funding, business model and end user costs. The network is owned by the metropolitan municipality. The metro's network is not only an urban project, but one geared to the whole of the Western Cape.

The network has an open access business model for use of its fibre optic infrastructure and switching centres. Phase 1, geared to the 2010 FIFA World Cup, entailed an investment of R125 million, comprising approximately 3% of the Cape Town Stadium budget, and accounting for 500 km of fibre. Phase 2 completed at the end of 2010, was intended initially to link 60 city buildings with each other and the Internet at 1 Gbps (previously the average was 0.3 Mbps), and to make dark fibre and Metro Ethernet available for third-party use.

The objective is for the whole of the city – from Atlantis through Kraaifontein to Gordon's Bay and Simonstown – to be connected by 2014. The city's 600 sites, including clinics, municipal buildings and libraries, will all be linked to the network. Furthermore, the broadband network aspires to deliver extensive additional capacity, to be sold to cell phone networks and Internet service providers. The latter will be permitted to resell the bandwidth to consumers – at what the city envisages will be more affordable rates than those that currently prevail. Service agreements with the providers will be required to ensure that cost savings are passed on to consumers.

The terms of use are simple and transparent. They also give expression to the city's stated intention of avoiding becoming a service provider to end users. Any ECS and ECNS licence holder is able to rent unlit fibre pairs between switching centres, rent fibre from any fibre distribution point to any nearby building (up to 300 m), and connect their own fibre to a switching centre. They are also able to rent rack space in switching centres for transmission equipment and buy 100 Mbps or 1 Gpbs circuits between switching centres.

The Cape Town model is innovative in that it allows for multiple independent operators to sell bandwidth services of almost any scale to end users, be they corporations or households. Since the network will be linked to various national backbones as well as undersea cables, operators will be able to mix and match the suppliers of data and services to build the kind of network that suits their own business models. This will increase competition, lower cost, and accelerate the roll out of broadband services to the maximum potential user base in the region.

eThekwini (Durban) Network

The eThekwini Municipality has installed more than 600 km of fibre optic cable, extending to Winklespruit in the south, Tongaat in the north and Hillcrest in the west. It includes an extensive web of fibre within the city centre and adjacent business suburbs in the northern, southern and western parts of the municipality. Fibre also extends into the townships of Umlazi, KwaMashu, Chatsworth, Phoenix, Clermont and Wentworth.

Over 130 eThekwini municipal sites are connected to this fibre optic cabling network, including radio towers, CCTV cameras and monitoring systems (eThekwini Municipality, 2010). Shopping centres in various areas are also connected and there are numerous last-mile fibre cables between the sites where fibre optic cable has been installed and the subscribers of Internet service providers.

In terms of new investments, i3 Africa will be engaging in a pilot project to roll out fibre to homes in the Durban area, using the water reticulation, or plumbing, system. To this end, feasibility studies are currently under way.

City of Joburg

In May 2011, the first phase of the Joburg Broadband Network Project (JBNP), at Westbury Secondary School, was completed. The project is being implemented by an Ericsson initiative called BWired at a cost of R1 billion. Ericsson is financing this investment, and will manage the network for 12 years, after which it will revert to the city.

Ericsson won the tender to implement the broadband infrastructure on 26 February 2009. Since April 2010, over 300 km of fibre optic cable has been laid in Johannesburg, from Midrand to Roodepoort, Braamfontein, Jabulani, Lenasia and Booysens. It is estimated that the project will be completed in 2013, at which time over 900 km of cable will have been laid. Figure 59 illustrates the intended extent of this network.

The implications of this project are immense. As is the case of Cape Town, the Johannesburg model allows for multiple independent operators to sell bandwidth services to end users. Furthermore, the network will be linked to various national backbones as well as undersea cables, and operators will be able to mix and match the suppliers of data and services. This model provides a solid foundation for increasing competition and lowering cost in the region.

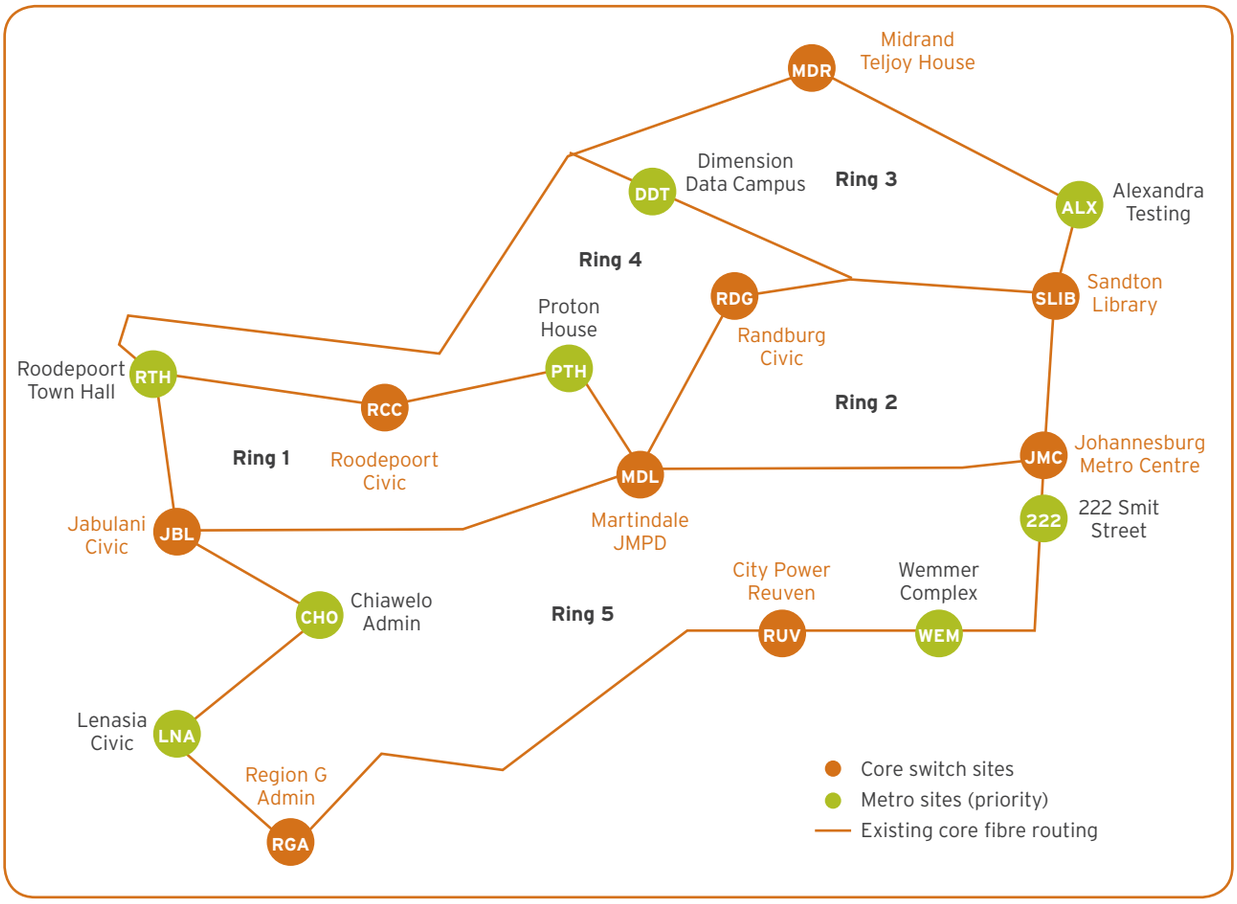


Figure 59: The planned Johannesburg network
Source: City of Joburg (2011)

Key challenges

Since the beginning of 2010, data demands in South Africa have intensified. Mobile networks report up to 55% annual growth in data use, and Internet service providers are under pressure to bring down the cost of uncapped services – i.e. unlimited data download capacity.

This has meant that fibre roll-out has not kept pace with demand. The consumer, therefore, has become as important as the corporate customer in pushing the networks' upgrade efforts. In 2010 alone, Vodacom budgeted R6 billion for network upgrades. According to Dark Fibre Africa, their own fibre roll-out will only meet the 'fibre to the tower' needs of the cellular industry by 2014.

These trends indicate that South Africa is entering a new era on the other side of the digital divide. While a large proportion of the population remains without access to broadband, immense resources have been put in place to create a national digital infrastructure. The future is bright: it is expected that the majority of the adult population will be using the Internet in some form by the end of the coming decade.

Many lessons have been learned in the process, not least that policy makers and regulators have a responsibility to facilitate and ease the adoption and roll out of technology and infrastructure, rather than create obstacles. It is a clear warning that current regulatory obstacles, including ownership rules, hinder the expansion of telecommunications infrastructure, which in turn constrains economic growth and development.

The key challenges in relation to the regulation of the telecommunications industry are as follows:

- lack of regulatory capacity;
- inappropriate allocation of resources;
- lack of coordination between fibre projects;
- lack of cohesion between national, provincial and local authority in terms of trenching permissions, policies and coordination;
- lack of funding and appropriate institutional support to roll out infrastructure in underserviced areas where commercial services are not available; and
- lack of access to computers/end user devices for the vast majority of the population.

The last point is critical: the rapid expansion of mobile Internet on phones should not be treated by policy makers as evidence that computer roll-out is no longer a critical issue. Enhancing access to computers is, however, a complex process. It is not as simple as supplying computers at low cost or even no cost, as has been proposed in programmes to supply laptops to teachers.

Such efforts require a supportive environment that includes hardware, software, training, content and applications that provide a purpose and incentive to users, including opportunities for the use of connectivity in business, working and social environments, with applications ranging from job seeking to community safety.

Conclusion: The way forward

Numerous frameworks, strategies and initiatives have been proposed over the years for increasing broadband penetration in South Africa. However, many of these have floundered because of the critical gap between infrastructure roll-out on the one hand, and access to skills and resources needed to make use of this infrastructure on the other hand.

The following key conclusions emerge in relation to issues facing broadband infrastructure in South Africa:

- *State-owned enterprises* should not be inappropriately allocated key roles in broadband infrastructure rollout where this is not their core business. Examples include Sentech and the SA Post Office. This adds both complexity and confusion to the already-complex dynamics of the industry.
- The state has a powerful voice in *relation to Telkom*, which presides over the most extensive network of both fibre optic and copper cable in South Africa. This resource, developed over decades, and in the case of copper largely while Telkom was still a government entity, should be more directly and efficiently utilised to overcome the gaps and shortcomings of the broadband environment.
- *Local Loop Unbundling* is a critical intervention to enable more competitive entities to take on the role of utilising the copper infrastructure, along with Telkom.
- The roll-out of the *metropolitan fibre networks* described in this report is a clear example of the progress that can be made when regulatory obstacles are removed. Numerous obstacles remain in place, particularly the lack of synchronisation between various laws, bylaws and regulations that add huge cost and complexity to these roll-outs. A government legal task team representing local, provincial and national authorities should treat this as a priority.
- It is a cause for concern that a country like Nigeria, with its far more limited infrastructure, can start planning for fibre-to-the-home, while it remains unattainable in South Africa. Indeed, it is an alarm signal that the *cost and complexity* of doing business in the telecommunications sector is a major obstacle for South Africa to compete on a global scale.
- Finally, the lesson learned from various government-backed initiatives, like the Gauteng Online schools project, is that *no amount of infrastructure will, in itself, close the digital divide*. It is critical that the people managing the infrastructure, those managing the interface between the infrastructure and users, and the users themselves, be given the skills necessary to give meaning to the infrastructure investments. The Gauteng Online project was a classic example of a 'cargo culture', in which technology is foisted upon a population without taking cognisance of that population's needs, or abilities to use the technology. Subsequently, it has been acknowledged that a 'train-the-trainers' programme is critical to the success of such projects. However, this is only one part of a broader human ecosystem that comprises skills, knowledge and mutual interest.

8 Conclusions:

A consolidated governance framework for infrastructure development

Photo: Sasol

Making the right infrastructure investment choices and ensuring effective delivery distinguishes high-growth economies from low-growth ones

Introduction

Making the right infrastructure investment choices and ensuring effective delivery distinguishes high-growth economies from low-growth ones.

Given that infrastructure is an enabler of development and that expenditure on infrastructure (of which 82% is allocated to economic infrastructure over the 2011/12–2013/14 MTEF) is the pivotal lever of an expansionary fiscal policy stance, it is critical that such expenditure is aligned with the objectives of the New Growth Path (Department of Economic Development, 2010) and National Development Plan (National Planning Commission, 2011). These include the targets for growth, employment, the reduction of poverty and redressing high rates of inequality. These targets should form the criteria to determine how resources are allocated across and within economic infrastructure sectors.

The history of the development of economic infrastructure in South Africa reveals that it was designed to support a resource-based growth trajectory, but at the same time excluded the majority of the South African population from access to economic opportunities. The growth-employment-poverty-inequality dynamic since 1994 has limited inclusive growth, mainly because economic growth has not been labour-absorbing, the marginalised lacked access to wage income, and income differentials increased within and between racial groups.

The renewed focus on infrastructure development in South Africa provides an opportunity to redress this situation. However, if the expansion of economic infrastructure is to redress the exclusion and marginalisation of vast sectors of the population from the fruits of economic growth, it must be implemented with this as an explicit objective.

This report has demonstrated that more must be done to optimally align the benefits of economic infrastructure sectors with national socio-economic objectives. Further, government institutional mechanisms have been limited in their ability to undertake long-term planning of the infrastructure life-cycles and to ensure effective coordination across different sectors, government spheres and departments.

While the diversity of the economic infrastructure sectors reviewed shows that they face unique challenges, a range of generic issues emerged. To summarise, these generic issues relate to the lack of a sufficient governance framework for infrastructure development within the context of a developmental state towards an inclusive growth path in South Africa.

The main generic dimensions towards such a governance framework are addressed next.

Network infrastructure requires state intervention and regulatory frameworks

Development is a complex and multi-faceted process that involves political, economic, social and cultural dimensions at all levels of society. In simple terms, a developmental state is considered to be a state that focuses on resolving such developmental challenges. The state is expected to be proactive in intervening and guiding the application of resources for setting and achieving developmental objectives, including infrastructure development, rather than simply relying on the forces of the market.

The usual means by which governments intervene to enhance public goods and positive externalities, or to limit external costs such as environmental degradation and pollution, include direct production, regulation, subsidisation and taxation. It is generally accepted that economic regulation is warranted where the competitive forces of the market do not lead to optimal socio-economic outcomes related to dimensions such as affordable prices, quality improvements, choice for consumers, the protection of common property resources, and universal access to public goods and services.

Network industries (e.g. water, electricity and telecommunications), by virtue of their functionality and social impact, usually require regulation to ensure universal access and affordability of essential services. South Africa is not unique in the dominance of state-owned enterprises (SOEs) in the delivery of infrastructure, principally because network infrastructure requires economies of scale that rule out a competitive market structure.

This study has revealed that the regulatory framework for the six economic infrastructure sectors reviewed is poor, both in design and implementation. The rail sector does not have an economic regulator despite the fact that it is a monopoly, while the failure to effectively regulate overloading in freight transported on roads generates negative externalities in the form of damage to roads and compromising the safety of other road users. In the water sector, pricing is such that where costs can be recovered, this is not being done and there is no regulator to manage the challenge of under-pricing.

Where the legislative foundation for regulation is sound, such as in the ports and ICT sectors, the regulators lack the capacity to effectively regulate their sectors. This constrains access and undermines the competitiveness of the national economy.

A further challenge shared by the six economic infrastructure sectors reviewed here is that there is a high degree of monopolisation (or markets that are not contestable). In many cases this results in prices that are very high in relation to international benchmarks. In other cases it results in under-recovery alongside poor operational performance and asset utilisation. This effectively acts as a constraint to both economic growth and access to these services by poor households and communities (for example, in the commuter rail and broadband sectors).

In short, South Africa will benefit from improving the regulatory environment in all six economic infrastructure sectors examined in this report. In particular, enhancing the capacity of regulators and giving them the ability to impose sanctions for uncompetitive behaviour must be a policy priority. The regulatory gaps (water and rail sectors) need to be filled as a matter of urgency. Furthermore, existing regulators must be better capacitated and monitored to ensure that they are not captured by specific industry players.

Policy frameworks for strategic direction and implementation guidance

Infrastructure delivery and expansion require a policy framework to guide resource allocation across and within sectors, and to ensure that such allocations and the sequencing of the expansion of infrastructure are aligned with the broader growth and development path. While this is currently not in place, the National Planning Commission (NPC) and the Presidential Infrastructure Coordinating Commission (PICC) have initiated a process to fill this vacuum.

Within this framework, policy for individual sectors must provide concrete parameters within which implementing agencies determine and execute their plans. This review has highlighted two problems: first, the absence of coherent policy in certain infrastructure sectors (for example, rail and roads); and, second, where comprehensive policies are in place (for example, the ports and ICT sectors), they are not implemented appropriately. The imperative is therefore for sector departments to close these gaps. Furthermore, no policy exists on the methodology of integrated infrastructure planning.

The establishment of the Department of Performance Monitoring and Evaluation (DPME), with an outcome dedicated to enhancing the scale and efficiency of economic infrastructure, has created capacity for ongoing monitoring of the effective implementation of policy. Where sectors (such as ports and telecommunications) fail to comply with policy and legislation, Cabinet should be made aware of these challenges through periodic reporting.

A final, but critical point in relation to policy, is that it must be credible and create certainty, at least for the next decade, if private investment is to be mobilised and for the desired fiscal stimulation to be realised through a higher growth rate. This has historically not been the case.

Integrated infrastructure planning and programming

Effective development planning initiatives that are aligned with development need to be integrated on several dimensions such as across sectors, space, spheres of responsibility, levels of government and timeframes. Despite South Africa's long history of planning, fragmentation and a silo mentality continue to prevail.

Therefore, it is not only improved planning within economic infrastructure sectors, but also integrated planning across sectors that will yield more effective outcomes. The water sector cannot operate without electricity which, in turn, cannot operate without water. Greater efficiency will be achieved if improved management can be attained through the availability of improved communications technologies as well as the capability to use data more extensively – both demand and supply can then be better managed.

The use of ICT in transport (across all three subsectors) is also imperative for enhancing management capability and increasing efficiencies. Improved planning should result in greater unity of purpose and effectiveness, and management enhancements should provide for the efficiency gains necessary to place South Africa on the desired growth and development path.

There are several pivotal institutions tasked with managing integrated infrastructure planning:

- The Infrastructure Development Cluster comprises all infrastructure sector departments and is tasked with oversight and integration of infrastructure planning and implementation.
- The Presidency has two departments tasked with integrated infrastructure planning: the National Planning Commission (NPC), which develops long-term integrated development plans for all sectors, including infrastructure; and the DPME, which has a dedicated economic infrastructure outcome that is monitored and reported to Cabinet periodically.
- The Presidential Infrastructure Coordination Commission (PICC) headed by the State President is tasked with coordinating and overseeing the implementation of strategic infrastructure projects.
- The National Treasury is responsible for providing the budget for national infrastructure.
- Infrastructure-related departments are responsible for medium to long-term planning of specific infrastructure sectors, programmes and projects.
- DFIs and SOEs are involved in infrastructure development, for example the DBSA, Industrial Development Corporation (IDC), Eskom, Transnet and Telkom. The Presidential Review Committee on SOEs is expected to make recommendations on improved oversight, coordination and collaboration between these entities. The proposed DFI Council is an effort in this direction.

The alignment of these various efforts into a coherent and synergistic approach could go a long way towards improving the effectiveness of infrastructure planning in South Africa. Integrated infrastructure planning should also include the development of performance indicators for infrastructure development.

In short, a systematic infrastructure development planning process is required to prioritise, sequence and resource projects, including the mobilisation of private sector participation.

Institutional frameworks

The implementation of infrastructure plans requires effective institutions. The analysis of institutions in all of the six economic infrastructure sectors, found that the current institutional frameworks could be improved to facilitate effective infrastructure delivery and expansion. There are three core challenges:

- The dominance of monopolies in all sectors results in outcomes that tend to improve the position of a specific entity, rather than to advance the national interest and development agenda.

- There is limited coherence and coordination between the three spheres of government and between government and the private sector.
- Regulation is weak, due to technical and resource constraints.

It is therefore necessary to explicitly acknowledge the constraints created by existing institutional frameworks. It is also important to distinguish between the frameworks that are currently in place and the actual performance of the different institutions. Institutional reform should only be initiated once capacity and coordination constraints have been dealt with and eliminated as an obstacle to effective infrastructure delivery.

Targeted resource allocation and financing mechanisms

It is critical to ensure that finance is available for infrastructure priorities as identified through integrated infrastructure planning. The mechanisms currently in place to finance infrastructure require urgent reform. Government budgets are often under-spent and opportunities are missed to crowd-in the private sector. Importantly, resources are not targeted at high impact priorities. 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 and for achieving the employment targets of the New Growth Path. At the same time, PRASA subsidises long-distance passenger rail at the expense of commuter rail improvement, even though the former cannot compete with road transport.

Across all the sectors reviewed in this report, challenges in mobilising resources for both the operations and maintenance, and future investments in economic infrastructure loom large. With the exception of the newly-created Provincial Road Maintenance Grant, there are no dedicated funding streams for operations and maintenance; planning processes have historically neglected to build these costs into infrastructure plans. The priority is therefore to create ring-fenced resource streams for infrastructure rehabilitation and maintenance, notably at the municipal level.

There is great value in further interrogating financing sources and mechanisms, to determine how they can be more effectively structured. Particular challenges include the poor performance of provinces in relation to provincial roads, and the effective subsidisation or cross-subsidisation of infrastructure services to redress poverty and inequality.

Criteria for resource allocation must be linked to national objectives, which find expression in the MTSF, New Growth Path and National Development Plan. Hence, while the expansion of public transport will have a significant impact on poverty and inequality, it requires subsidisation. In contrast, the economic rationale for expanding freight rail infrastructure requires some interrogation with respect to the economic returns of such investment. Yet Transnet is able to finance much of this expansion through its own balance sheet.

The facilitation of project financing should include activities such as undertaking project preparation (including credible cost-benefit analysis), structuring project finance, designing legal entities, designing and conducting bid processes, drafting and negotiating financial and legal terms, and finalising post-signing financial arrangements.

Capacity constraints

Skills shortages are a feature of South Africa's socio-economic landscape and are not unique to network infrastructure. In network infrastructure delivery, technical capacity constraints are most pronounced at the municipal (water and electricity distribution, and trenching permissions for the roll out of fibre optic cables) and provincial (provincial roads) levels. However, national regulators also exhibit capacity constraints as evidenced by the under-resourcing of the Ports Regulator and the performance of ICASA.

Addressing financial constraints (as in the case of the Ports Regulator) is easier than the development of technical capacity (for example, in local and provincial government). Capacity building is, however, a long-term endeavour, involving an education and training system that takes a considerable amount of time to yield the required skills. Capacity building should therefore be planned for at a national level by aggregating future skills shortages across the various infrastructure sectors.

A separate issue is the internal dynamics within the institutions and entities tasked with the delivery of economic infrastructure. Poor organisation and management of technical expertise, alongside low morale, will diminish the returns from skilled individuals. These challenges are endemic in the public sector. Correcting them presents a faster and more viable avenue for enhancing capacity and productivity in the short term, while providing for training to develop skills over the longer term.

Effective implementation of infrastructure programmes and projects will require considerable attention and capacity for:

- improving alignment between infrastructure life cycle planning and public finance management processes so that projects with high development impact are adequately resourced;
- enabling project financing and strategic investment programmes, including off-budget financing via Development Finance Institutions; and
- strengthening capacity within government, particularly within key infrastructure departments, and provincial and local government.

Backlogs, rehabilitation and new infrastructure

Project preparation that ignores asset life cycle and longer-term strategies (e.g. localisation of input production) undermines sustainability and industrialisation. Inadequate operations and maintenance of infrastructure result in faster degeneration of assets and forego job creation opportunities.

In all the economic infrastructure sectors, there is a combination of existing infrastructure that requires rehabilitation (as a consequence of lack of maintenance), backlogs that need to be addressed, and new infrastructure projects to be implemented. There are tensions between these different streams of infrastructure delivery. It is therefore critical that they are differentiated in implementation plans, prioritised, and allocated dedicated resources.

Unfortunately, the need for rehabilitation and new investment are currently conflated with the consequences of poor maintenance and operational inefficiencies. It would therefore be rational to first operate existing infrastructure efficiently. Once the contribution of this intervention to increased infrastructure service delivery is exhausted, further investment in expansion should then be pursued.

In reality, however, the spatial and sector needs of a growing economy will result in the three infrastructure streams being implemented simultaneously. It is therefore imperative that the three streams of activity and resource flows are explicitly disaggregated so that they can be effectively monitored. This is critical to avoid the ongoing situation where rehabilitation of existing infrastructure is neglected in favour of new investments. It is also important to monitor the elimination of backlogs as a separate stream of delivery.

In practical terms, infrastructure delivery must be about the life cycle of the asset, not just the delivery. If you can't afford the life cycle cost, do not build it.

Conclusion: A consolidated governance framework for infrastructure development

In conclusion, the generic issues that emerged from the review of the economic infrastructure sectors reveal the need for a consolidated governance framework in South Africa. Strategically, taking all role players into account, the integrated infrastructure planning and programming process needs to identify infrastructure projects that will have development impact by answering the following five consecutive questions:

- Is the infrastructure aligned with the socio-economic context?
- Can evidence of demand and/or economic potential for the service be demonstrated?
- Is the project viable and is it the best alternative?
- How will the cost of the infrastructure be covered equitably?
- Is there enough implementation capacity?

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Annexure

Delivery agreement for Outcome 6 (October 2010)

An Efficient, Competitive and Responsive Economic Infrastructure Network

Introduction

Government has agreed on 12 outcomes as a key focus of work between now and 2014. Each outcome has a limited number of measurable outputs with clearly defined targets. Each output is linked to a set of activities that will help achieve the targets and contribute to the outcome. Each of the 12 outcomes has a Delivery Agreement which in most cases involves all spheres of government and a range of partners outside government. Combined, these agreements reflect government's delivery and implementation plans for its foremost priorities.

This Delivery Agreement is a negotiated charter which reflects the commitment of key partners involved in the direct delivery process to implement the identified activities effectively. It covers strategic and priority outputs and sub-outputs which, when achieved, will contribute to the realisation of **Outcome 6**. Additional and supporting outputs, sub-outputs and activities which also contribute to the achievement of **Outcome 6** are captured in the delivery matrix attached as Annexure A. The Delivery Agreement provides detail to the outputs, targets, indicators and key activities to achieve **Outcome 6**, identifies the required inputs and clarifies the roles and responsibilities of the various delivery partners. It spells out who will do what, by when and with what resources. The outcomes apply to the whole of government and are long-term. While the Delivery Agreement may contain longer term outputs and targets, it also includes outputs and associated targets that are realisable in the next 4 years.

It also considers other critical factors impacting on the achievement of **Outcome 6**, such as the legislative and regulatory regime, the institutional environment and decision-making processes and rights and resources needed as well as the re-allocation of resources where appropriate.

This Delivery Agreement will be reviewed annually in light of lessons learned and challenges identified in implementation as well as the monitoring and evaluation (M&E) of findings. Accordingly, it will be refined over time and become more inclusive of the relevant delivery partners.

Glossary

ACSA: Airports Company of South Africa
CAA: Civil Aviation Authority
CST: Central Standard Time
CTF: Coal Transporters' Forum
DFI: Development Funding Institutions
DTT: Digital Terrestrial Television
DVBT: Digital Video Broadcasting Terrestrial
DIA: Durban International Airport
DSM: Demand Side Management
ECNS: Electronic Communication Network Services
EDI: Electricity Distribution Industries
Gbps: Gigabytes per Second
GIAMA: Government Immovable Asset Management Act
GFB: General Freight Business
ICASA: Independent Communications Authority of South Africa
ICT: Information and Communication Technology
INEP: Integrated National Electrification Programme
IPP: Independent Power Producers
IRP: Integrated Resource Plan
IRPTN: Integrated Public Transport Networks
ISDBT: Integrated Services Digital Broadcasting Terrestrial
ISMO: Independent System and Market Operator
MIG: Municipal Infrastructure Grant
MTEF: Medium Term Expenditure Framework
MTPPP: Medium Term Power Purchase Programme
MW: Megawatt
NERSA: National Energy Regulator of South Africa
NIMS: National Infrastructure Maintenance Strategy
NLTA: National Land Transport Act
Mtpa: Million tons per annum
PPA: Power Purchase Agreements
PRASA: Passenger Rail Agency of South Africa
RE: Renewable Energy
RED: Regional Electricity Distributor
REFIT: Renewable Energy Feed-in Tariff
RIFSA: Road Infrastructure Framework for South Africa
SABC: South African Broadcasting Corporation
SANRAL: South African National Roads Agency Limited
STB: Set Top Boxes
TCTA: Trans-Caledon Tunnel Authority
TNPA: Transnet National Ports Authority
USAF: Universal Services Access Fund

High level problem statement

South Africa's infrastructure spend has been increasing since the 2003/04 Medium Term Strategic Framework, reaching a peak with the country's preparation for the FIFA 2010 World Cup. There is evidence to suggest that increases in infrastructure investment have helped to cushion the country against the harsh effects of the global financial crisis. However, the sector is characterised by serious challenges which limit its full contribution to the economy. These challenges range from the dominance of monopoly suppliers, lack of competition and weak regulation. In addition, the maintenance of infrastructure has not been prioritised over the years. The upshot of such failures has been infrastructure, operations and services which are not fully responsive to the country's economic needs.

Against this backdrop, Outcome 6 focuses on the corrective measures or interventions that government needs to institute in order to maximise the impact of infrastructure investment to economic growth. The aim is to increase competition, strengthen regulation and accelerate the revitalisation of the ageing infrastructure.

Four key categories of constraints to infrastructure development have been identified in respect of these sectors as summarised and discussed below:

Insufficient and inadequate infrastructure	• Infrastructure backlogs • Supply and demand imbalances • Lack of clarity on roles and responsibilities: policy planning, approvals, implementation, funding and monitoring.
Lack of maintenance and refurbishment	• Maintenance receives low priority, is poorly funded and leads to higher costs in sustaining infrastructure networks.
Operational inefficiencies	• Operational inefficiencies lower the levels of service, increases costs and result in greater cost required to maintain the infrastructure.
Uncompetitive environment and regulatory constraints	• Lack of competition and high barriers to entry limit the responsiveness of the sector. • Regulation is weak, not effectively guided by policy and there are constraints in terms of capacity and scope.

Uncompetitive environment and regulatory constraints

Monopoly suppliers largely provide infrastructure in the transport and energy sectors. This has resulted in a lack of competition and high barriers to entry, which in turn has limited the responsiveness of the ports, rail, and electricity generation sectors to economic growth. Furthermore, regulation within and across the sectors has been weak and characterised by the absence of policy guidance in terms of the broad economic objectives pursued by government. Consequently, regulators often do not take into account government's objectives when intervening in the respective sectors.

In addition, there are capacity constraints within the regulators. For example, in some instances regulators come up against monopoly suppliers who are more resourced and render the regulator ineffective, through prolonged litigation processes. In other instances, the scope of regulation is inadequate in relation to the challenges the sectors face e.g. ICASA having to keep abreast with a rapidly changing communications environment which is driven by private sector innovation. The weak regulatory environment and practices manifests in pricing and tariff structures that are not cost reflective. Thus, there is no transparency in the extent to which prices include subsidies and this leads to questions around the sustainability of services being provided.

Insufficient and inadequate infrastructure

Over the years there has been inadequate investment in economic infrastructure and backlogs continue to grow. Consequently, economic growth has been constrained by a lack of infrastructure in some instances, and in other instances by the infrastructure going into disrepair due to inadequate investment in maintenance.

This problem stems from a lack of long-term planning in a manner that takes into account projected economic demand growth. The lack of co-ordination between capital investment programmes by the public and private sectors, including its sequencing and financing, leads to poor harnessing of potential synergies that exist for the country's common good.

The lack of infrastructure in certain geographical locations in South Africa has been identified as a constraint to economic growth. Whilst access to some infrastructure (like electricity) might be seen as a social programme, there is a correlation between access to electricity by households and economic growth (stimulates demands for other goods and services that rely on electricity, e.g. appliances). Consequently, mechanisms need to be put in place to ensure that universal access is not a constraint to economic growth.

Funding in a constrained economic climate is an additional problem, but we have not been able to manage this through innovative approaches to mitigate the financing risks. Poor leveraging of finance sometimes leads to investments in old technologies, which in the long run becomes costly for the country in time and financial terms. For example, in transport the lead time for acquiring rolling stock is very long because equipment is sourced from the global market which is now mainly geared to support new technologies. Another example is rail infrastructure that cannot accommodate transportation needs due to lack of expansions to accommodate increasing needs, e.g. mining (coal mining in the Waterberg area) and agriculture, which impedes the ability of those industries to grow and contribute to the economic growth of South Africa. Container capacity at ports not being able to meet capacity demands are an impediment to exports required to support economic growth.

Lack of maintenance and refurbishment

Maintenance of economic infrastructure does not enjoy the level of priority commensurate to ensure a sustainable and reliable service. In some sectors the problem is due to service providers appropriating inadequate levels of funding for maintenance, and in others the problem is due to the revenue not being used for the intended purpose, e.g. electricity distribution at municipality level. Poor maintenance leads to accelerated asset degradation and if there is no investment in refurbishment, the infrastructure will reach a state of complete degradation – the problem of infrastructure needing complete overhauling is common-place in the economic sector.

Poor maintenance and refurbishment of infrastructure can partly be located in the lack of implementation of policy and enforcement of maintenance instruments as well as ensuring that budgets provide for maintenance programmes and monitoring for compliance. Indeed, whilst government has passed the Government Immovable Asset Management Act (GIAMA) and developed the National Infrastructure Maintenance Strategy (NIMS), the implementation of and compliance with the provisions of these instruments has been very weak at best.

A particular problem that is prevalent in municipalities and some provinces is the lack of institutional capacity for maintenance, due to skills shortages. Generally, there is a lack of sector specific asset management policies, life cycle management models and management capacity for executing maintenance to the desired standard.

Unmaintained infrastructure affects a significant part of logistics in the economy from passenger transport to the transportation of goods, as it means it might take longer to transport people and goods from one destination to another, so that goods are not received on time, and many hours of work are lost with vehicles stuck in the traffic for extended hours. All these impact negatively on economic growth. Old wagons and signalling systems impact negatively on the reliability of rail freight, meaning that goods are not able to reach their destinations at desired times, or in some instances customers might cancel orders due to costly delays, all of which impact negatively on the economy's ability to grow.

Operational inefficiencies

Operational inefficiencies lower the levels of the utility service and increase the costs of the service. This invariably leads to additional infrastructure being constructed to provide capacity where an improvement in operational efficiency could have ameliorated the need for the infrastructure. The lack of consistency in the reliability of infrastructure services is symptomatic of the underlying problems.

Whilst there are a myriad of factors that contribute to operational inefficiencies; low productivity levels; poor labour relations and the management thereof, the lack of experience and skills as well old technology are key contributory factors. These operational problems are most acute in the transport sector and as a result, Output 6 of this Delivery Agreement focuses on operational efficiency indicators in this sector.

The Department of Public Enterprises is currently monitoring the Transnet and Eskom Build Programmes and will consistently include the relevant reports as part of the Cluster's progress report to apprise Cabinet of the fact that the infrastructure investment is on schedule and the relevant potential risks are being monitored and control measures are in place to mitigate those risks.

Identification of delivery partners

As a cross-cutting programme, infrastructure development requires partnerships with multiple stakeholders within and outside government. Budget and planning for infrastructure programmes cut across different government departments; the various spheres of government and the State-Owned Enterprises or Agencies. To ensure that the Infrastructure Development Cluster achieves its mandate and deliverables in a consolidated manner, a set of partnerships with various stakeholders will be required. However, for effective accountability, it will be necessary to differentiate between lead and core departments, including external stakeholders that will provide technical support and contribution towards achieving the different sets of outputs as outlined in the Delivery Agreement.

Core departments and strategic partners will, as and when required, form task teams and report on various implementation elements under this outcome. The delivery partners will be led by the lead Cluster departments (chair and co-chair), in this case the Departments of Transport and Public Enterprises and other core departments for the various sectoral outputs.

Table 1: Proposed Project Implementation Forum

Lead Department	Co-Chair	Signatories to the Delivery Agreement	Key Stakeholders
DOT	DPE	Department of Energy Department of Water and Environmental Affairs Department of Communications	National Treasury Department of Economic Development Department of Agriculture Department of Cooperative Governance and Traditional Affairs Transnet, Eskom, SALGA, SANRAL, TELKOM, SABC, Regulators, PRASA, Private Sector, SENTECH, Host Cities, ICASA, Trans-Caledon Tunnel Authority (TCTA), Central Energy Fund, Development Funding Institutions (DFIs). Provincial Departments with infrastructure development functions and responsibilities.

Linking outputs to Outcome 6

The benefits of investing in infrastructure are derived from the dual purpose of infrastructure being a final good providing services directly to consumers (e.g. in water and electricity) as well as an intermediate input that raises the productivity of other sectors (e.g. rail). The provision of efficient infrastructure can also stimulate new investments and job creation. However, in order to realise these benefits, it is imperative that the infrastructure provider is operationally efficient, the services are appropriately priced and the provider is accessible to users. South Africa's location which is far from its markets and the undesirability of weakening exchange rates to boost its competitiveness necessitate that the country's economic infrastructure be far more efficient and cost effective.

Over the past three decades there has been a general deterioration in most infrastructure across the sectors. In part this was due to a shift in policy in favour of social development imperatives to address our country's political legacy issue, resulting in inadequate investment in and maintenance of infrastructure. However, other contributory factors have included lack of integrated planning, inability to regulate the various components of the infrastructure network sector and develop and manage processes to bring in private sector role players in the provision, operations and/or maintenance of our infrastructure. Operational efficiency, competitive pricing and accessibility continue to hamper delivery in infrastructure sectors. To address these, the following measurable outputs and targets have been identified to achieve the outcome: **"An efficient, competitive and responsive economic infrastructure network."** These are:

Output 1: Improving competition and regulation.

Output 2: Ensure reliable generation, distribution and transmission of electricity.

Output 3: Ensure the maintenance and strategic expansion of our road and rail network, and the operational efficiency, capacity and competitiveness of our sea ports.

Output 4: Maintenance and supply availability of our bulk water infrastructure.

Output 5: Communication and information technology.

Output 6: Develop a set of operational indicators for each segment.

The graphic illustration below provides a summary:

Challenges	Electricity	Transport	Water	Communications
Insufficient and inadequate infrastructure	• Demand outstrips supply • Funding for existing and new capacity required	• Demand outstrips supply • Constrained and accessibility and mobility across logistics chain	• Extending bulk networks & storages for greater access • Appropriate pricing & funding models	• Access for under-serviced areas
Lack of maintenance of refurbishment	• Distribution maintenance and refurbishment backlogs • Funding for backlogs	• Backlogs in strategic road refurbishment, rail infrastructure and strategic roads • Funding Model	• Aging dams and distribution systems • Skills and management of distribution systems	
Operational inefficiencies	• Reliability of infrastructure • Transmission network is not able to meet the contingency requirement for (N-1)	• Productivity (port crane moves, wagon turnaround) • Rail Reliability		
Uncompetitive environment and regulatory constraints	• Pricing – Non-cost reflective tariffs • Lack of network access for IPPs	• Industry structure • Non-cost reflective tariffs • Policy & Regulatory Frameworks • Lack of private operators	• Pricing – Cost reflective tariffs on raw water • Appropriate institutional arrangements • Improved regulation	• Cost to communicate

The sectoral components of the infrastructure network dealt with in Outcome 6 are:

- Transport (ports, rail and roads)
- Water
- Electricity
- Information and Communication Technology

Output 1: *Improving competition and regulation* affects all sectors and has been identified as a cross cutting output and is covered as a generic challenge in all sectors. The highly concentrated supply (industry monopolies) and the weak regulatory environment serve to sustain a lack of competition among infrastructure providers. The output aims to address the lack of competition and high barriers to entry which limit the responsiveness of the sectors to economic demands.

Output 2: *Ensure reliable generation, distribution and transmission of electricity* aims to tackle planning challenges within the electricity sector and to improve the efficiency and reliability of electricity infrastructure. Output 2 activities will address planning and reliability challenges caused by a lack of maintenance within the distribution sector.

Output 3: *To ensure the maintenance and strategic expansion of our road and rail network, and the operational efficiency, capacity and competitiveness of our sea ports* aims to address the underinvestment in ports, road and rail, the consequential obscure subsidies in ports and rail which impact on pricing efficiencies as well as the need to secure adequate funding for infrastructure investment. It addresses the requirement for a shift of goods from road to rail to enable competitive and responsive supply chains for bulk exports from South Africa. The activities flowing from this output address the need to have an innovative solution for road maintenance.

Output 4: *Maintenance and supply availability of our bulk water infrastructure* aims to address the insufficient supply of water to support the growing economy. The output proposes an intervention through government investment in the bulk raw water infrastructure network which will serve as a catalyst for growth in development corridors.

Output 5: *Communication and information technology* deals with the need for improved broadband infrastructure to stimulate economic growth, considering that the ICT market contributes approximately 6.4% of South Africa's GDP (according to the International Peer Benchmarking Study on the Cost to Communicate in South Africa, 2008). The cost of broadband and its impact on low broadband penetration and usage, digital divide and rural-urban divide are addressed to ensure provision of competitively priced ICT infrastructure that is responsive to the needs of the South African economy.

Output 6: *Develop a set of operational indicators for each segment.* Although there are challenges with operational inefficiencies across all infrastructure networks, the problem is more pronounced in the transport sector and it constitutes a major constraint to the competitiveness of the transport system, particularly in ports and rail. Consequently, Output 6 which focuses on the development of operational indicators is only addressed in the port and rail sub-sectors of transport. Operational efficiency indicators selected to monitor improvement in efficiencies include port productivity and rail reliability indicators.

Output 2: Ensure reliable generation, distribution and transmission of electricity

Electricity has been characterised by blackouts and brownouts (where there is insufficient power to run machinery) which impact negatively on the economy. The following have been identified as key issues to address which, when successfully implemented, will significantly improve generation, distribution and transmission or sustainable supply of energy for the country:

(i) introduction of a long-term planning framework (Integrated Resource Plan or IRP);

(ii) development of a funding model for the build programme of the country;

(iii) introduction of a regulatory environment conducive for Independent Power Producers (IPPs) to bring in investments in the generation sector side-by-side with Eskom;

(iv) creation of an Independent System Operator for electricity; and

(v) increasing access to electricity by domestic households.

Long-term plan to balance electricity supply-demand

The need to provide a long-term plan for electricity capacity expansion is premised on the need to trigger timely investment decisions that will be in tandem with economic growth. Historically South Africa has either over-invested in new power stations, or delayed investments to such an extent that energy security has been jeopardised. This problem is based on the lack of a co-ordinated approach to initiating timely investments, exacerbated by the lack of a long-term plan that provides certainty about the investments necessary for the sector. The Integrated Resource Plan (IRP) is designed to address this problem. It also provides a framework for meeting other government objectives for the electricity sector, including diversification from coal as a dominant source of primary energy, curbing environmental degradation caused by the sector (through renewable energy and energy efficiency) and aligning with the growth path set for the country.

Lead department	Department of Energy
Other departments	IMC on Energy (DPE, DWA, NT, CoGTA, DTI, Presidency)
Other stakeholders	Eskom

Funding model for the generation capacity programme

In order to ensure that the IRP is practical and implementable, it needs to be linked to a funding model. The funding model will address the requirements of Eskom and the IPP by considering the appropriate allocation between tariff, fiscal and borrowings in respect of the capacity required in the IRP.

In the case of Eskom, a funding gap of about R190 billion has been identified in relation to its build programme. The funding of Eskom going forward requires government to seriously consider other related issues (beyond tariff and guarantees), like the appropriateness of an equity injection by the State and the extent to which the private sector rather than Eskom must deliver on the build programme. In the case of IPPs, the funding model will also address the extent to which a government support package needs to be provided to the buyer of electricity from IPPs, for credit-enhancement purposes.

Lead department	Department of Public Enterprises
Other departments	IMC on Energy (DPE, DWA, NT, CoGTA, DTI, Presidency)
Other stakeholders	Eskom, development finance institutions

Conducive environment for Independent Power Producers

Eskom is a dominant player in the generation of electricity, providing over 90% of the country's requirements. The extent of funding required for new power stations over the next 20-years is a key determinant in the decision that Eskom alone cannot provide the capacity requirements, and that IPPs are necessary to bring in private sector investment to augment the public sector funding.

Lead department	Department of Energy
Other departments	IMC on Energy (DPE, DWA, NT, CoGTA, DTI, Presidency)
Other stakeholders	Eskom, DTI

Institution of the Independent System Operator (ISMO)

The current regulatory framework for power generation and trading favours Eskom and is not conducive for IPP participation in the sector. In addition to the introduction of an Independent System Operator (a role which Eskom currently plays at the same time as being a dominant seller), which is discussed hereunder, there are regulatory constraints that have to be addressed to facilitate IPPs. These constraints include open and non-discriminatory access to the transmission grid, providing regulatory certainty to the buyer regarding cost recovery and a fair return on investment, and providing government support to underpin the risks associated with power purchase agreements.

The ISMO will provide a platform for introducing IPPs and renewable technologies whilst minimising impact to the end-users

Lead department	Department of Public Enterprises
Other departments	IMC on Energy (DPE, DWA, NT, CoGTA, DTI, Presidency)
Other stakeholders	Eskom, development finance institutions

Reduce distribution maintenance backlogs

The distribution leg provides the interface with the electricity end-user in the electricity value chain. Whilst it is necessary to build new power stations and to increase supply capacity, it is equally important that the integrity of the distribution sector is improved to ensure reliability of electricity supply and security of energy supply. The reliability of municipal distribution infrastructure in particular, is compromised by huge backlogs in maintenance and refurbishment. Consequently, this sub-output will assist in achieving reliability through the reduction of current levels of maintenance and refurbishment backlogs in municipalities and Eskom (currently estimated at R27 billion) to R15 billion by 2014.

Household access to electricity and protection of the poor

Access to electricity in South Africa has improved considerably from the levels of 1994. Current access is beyond 80% from 32% before 1994. Even with such figures, a lot more work is still required to ensure that 92% of the country is electrified by 2014. Protection of the poor also remains important in the context of rising tariffs. The Electricity Pricing Policy highlighted the need for cost reflective tariffs, this is being phased in over 5 years by the regulator.

Lead department	Department of Energy
Other departments	IMC on Energy (DPE, DWA, NT, CoGTA, DTI, Presidency)
Other stakeholders	Salga, metros

Funding framework

Funding for electricity industry infrastructure is one of the biggest challenges for the country. Whilst a subordinated loan of R60 billion has been provided by government for committed capital expenditure, a further R550 billion (of which R176 billion has already been granted by government) in guarantees is required by Eskom to source adequate funding and limit the risk of expensive loans.

Further funding needs to be sought for the electricity distribution industry maintenance and refurbishment backlogs.

Project details

Major capital projects	MW installed	Total costs (est.) (R'bn)	Funding secured (Y/N)	Funding source	Completion date
Grootvlei RTS	1 200	7.9	Y	Retained Earnings+Debt	2011
Komati RTS	1 000	13	Y	Retained Earnings+Debt	2012
Ingula	1 352	21.8	Y	Retained Earnings+Debt	2015
Kusile	4 800	170	N	Debt, Equity, Guarantee	2015
Medupi	4 764	125	Y	Debt, Equity, Guarantee	2013
Arnot Capacity Increase	300	1.45	Y	Debt, Equity, Guarantee	2011
Sere Wind Farm	100	1.17	Y	Debt, Equity, Guarantee	2012
Upington Solar	100	3.5	Y	Debt, Equity, Guarantee	2012
OCGT IPP	1 000	6	N	Debt, Equity, Guarantee	2013

Output 3: Ensure maintenance and strategic expansion of road and rail network, operational efficiency, capacity and competitiveness of sea ports

The maintenance and expansion of road and rail networks, operational efficiency, capacity and competitiveness of the sea ports is an overarching output for streamlining freight and passenger movement in a manner that allows integrated planning and competitive supply chains across the transport sector. This output therefore has the following underpinning elements as sub-outputs:

Increase market share of total rail freight

It is estimated that there are approximately 1,5 billion tons of land freight moving within the country. However, only about 177 million tons move by rail, and the rest is by road. This has led to a situation where there is overloading on roads whilst rail remains under-utilised. Inefficiencies within the rail system have often been cited as the main driving force behind the under-utilisation of rail. The problem is further exacerbated by the absence of competition in the rail environment.

In this regard activities on this output include a detailed diagnostic of Transnet Freight Rail (TFR) operations and issues related to the continuous decline of rail market share to road, where road currently transports over 13% of corridor traffic (i.e. 213 million tons) and rail only 3%. Critical rail investments to address backlogs will be made in respect of the procurement of rolling stock (i.e. wagons and locomotives) for Transnet and PRASA. Planned rolling stock investments are dealt with as part of the Competitive Supplier Development Programme (CSDP) which will consolidate the 15 year fleet procurement plan for the two State entities. An additional measure to increase rail market share is through the introduction of multiple operators on the branch line network. The logic is that the revitalisation of branch lines will facilitate additional volumes on the core/primary network as branch lines are feeders to the core network. Currently branch lines move 5.9 million tons (net tons per annum) of freight and the target is to increase rail-friendly cargo moved on branch lines to 8 million tons by 2014. The revitalisation of branch lines will not only contribute to increased traffic on rail but will impact positively on the secondary road network (where it is located parallel to branch lines) which currently carries the bulk of the traffic that should naturally be moved by rail.

In order to attract more cargo to rail, there is a need for government to intervene decisively to increase the rail market share and foster competition through the introduction of private operators. In the meantime, government has set a target of increasing the rail market share to 250 million tons by 2014.

There is a joint initiative involving the DOT, DPE and Transnet which is aimed at developing policy that will ensure an optimum cargo split between road and rail; increase corridor traffic on rail; and mitigate further deterioration of the secondary road network.

Lead department	Department of Public Enterprises
Other departments	DoT, NT, Presidency
Other stakeholders	Transnet, freight industry

Adequate maintenance of roads in support of coal haulage and migration of coal haulage to rail

In February 2010 Eskom, the South African National Roads Agency Limited (SANRAL) and the Mpumalanga Department of Public Works, Roads and Transport (DPWRT) undertook a comprehensive assessment of the condition of existing and possible future coal haulage routes in an effort to establish and identify the coal haulage network. The network comprises 2430 km of road length and a project list of all the road sections required to be repaired and their proposed treatments and initial cost estimates was done for each project.

Funding for road rehabilitation has been a major challenge for both Eskom and government. Working group 8 (Coal haulage logistics) of the Inter-Ministerial Committee (IMC) in Energy has established a funding mechanism to repair and rehabilitate the damaged road. The funding for the coal haulage road rehabilitation programme can be divided into three streams which include:

- Existing allocations towards the coal haulage network in Mpumalanga of R120 million in 2010/11 and R200 million in 2011/12. The DPWRT is utilising these funds for the rehabilitation of coal haul roads (P29/1 from eMalahleni to Ogies and P50/1 from Ermelo towards Morgenzon).
- Expenditure and reporting on these projects will be separated from general reporting on the Provincial Infrastructure Grant and made available to the National Treasury on a quarterly basis.
- Funding available on the DOT budget baseline amounts to R750 million in 2011/12 and R750 million in 2012/13.

In an effort to reduce the number of trucks on the roads, Eskom plans to execute the rail migration plan which will see the migration of some 26 million tons per annum (Mtpa) of coal from road to rail by 2018. This will reduce the road transport to less that 5% of the total coal procured.

Currently Eskom only receives coal by rail at the Majuba Power Station, amounting to ~ 5,8 Mtpa in FY 2010 (year ended 31 March 2010). This coal is railed in coal wagons, and is off-loaded by means of a tippler mechanism into a conveyor system. This volume therefore serves as the baseline for the Eskom rail migration growth profile of volumes to be railed going forward.

The successful implementation of the rail migration strategy will see the number of full truck trips per day decline to some 550 and the total required number of vehicles reduced to approximately 250. This strategy has been formally tabled by Eskom with the Road Transporters and has been fully debated with their representative body, the Coal Transporters Forum (CTF).

Eskom and the TFR have agreed to conclude a Heads of Agreement covering the rail migration strategy, and this document has had input from DPE, the Department of Transport (DoT) and the National Treasury.

This Heads of Agreement will comprehensively deal with:

- Capacity (slot) planning in the National Infrastructure Plan
- Service design, train plans and resourcing (as has been supplied for Majuba and Camden)
- Required investments by TFR in rolling stock (locomotives/ wagons) and infrastructure; and
- Competitive pricing regime for Eskom business.

As Government's shareholder representative for both Eskom and Transnet, the DPE will be responsible for ensuring that a Heads of Agreement is concluded between the two parties and that the rail migration milestone dates are timeously achieved.

The DPE will also be responsible for ensuring that all inefficiencies encountered by Transnet are closely monitored to prevent any delays and all required investments by Eskom and Transnet are rolled out as planned. Eskom and the TFR have already established structures to manage the growth in volumes to Majuba as well as joint project teams to manage the Majuba Heavy Haul line as the other planned rail projects.

Lead department	Department of Transport
Other departments	DPE, Energy, NT, Presidency
Other stakeholders	Eskom, Transnet, Mpumalanga provincial government

Implementation of the Ports Act

A high proportion (28%) of South Africa's GDP is derived from exports. Globally, ports face multiple challenges as a result of fast growing trade volumes and global trends that drive structural changes. The freight system's ability to effectively respond to these challenges will become a critical factor in ensuring future trade growth prospects.

This sub-output aims to address the challenge faced by South Africa to achieve the objective of a globally competitive ports system that is responsive to the shipping industry trends. New investments in ports are now mainly targeted at certain ports which are well placed to serve as major or hub ports. This development arises from the global shipping trend of bigger vessels calling at only major ports thus necessitating the need for trans-shipment (in the container industry specifically). These hub ports would then service the shipping lines for purposes of trans-shipment to other 'smaller' ports which serve as feeder ports. The port of Ngqura has been identified as the best location to establish a container trans-shipment facility. Presently the public operator, Transnet Port Terminals (TPT) is the dominant operator (with 98% of the market) of container handling facilities. In consideration of the requirements for a viable terminal, it is proposed that a private operator (with some association to shipping lines), is introduced at the Ngqura container terminal to enhance Ngqura's role as a transshipment terminal. The introduction of a new private operator will also entail some competition to the public operator (TPT) for the market. In order to achieve this objective, there is a need to review certain provisions of the Ports Act.

Lead department	Department of Transport
Other departments	DPE, NT, Presidency
Other stakeholders	NPA

Rail Act

The development of the rail policy and act to provide an enabling framework for economic and safety regulation within the rail sector is necessary to address the weaknesses in competition and regulation in this sector. The branch lines will benefit from the policy and legislative review.

Lead department	Department of Transport
Other departments	DPE, NT, Presidency
Other stakeholders	Transnet, NPA

Review of the transport industry structure (separation of infrastructure and operations)

The transport industry is characterised by poor institutional co-ordination and regulation and limited private sector participation especially in the rail and ports sectors. The challenge extends to regulatory institutions where the policy emphasis has been on establishing regulators for various modes e.g. port and rail. Further impacting this challenge is the fact that there is no clear distinction between policy, regulation and operations. This has resulted in difficulties in streamlining transport logistics in the country.

A re-appraisal of the transport industry structure is necessary to address these challenges, which appraisal will be achieved through a review of the National Freight Logistics Strategy. In addition, a comprehensive Transport Regulator for the sector is being considered, with the aim of facilitating private sector participation in ports and rail.

Lead department	Department of Transport
Other departments	DPE, NT, Presidency, economic development
Other stakeholders	Transnet, NPA

Framework for cross-subsidisation in the transport sector

There is a lack of transparency with cross-subsidisation of operations and infrastructure in ports and rail, which affects funding and investment decisions. An Inter-Ministerial Committee between the DoT and DPE has been established to provide guidance and direction on the development of a model for transparent cross subsidisation and information sharing.

Lead department	Department of Transport
Other departments	DPE, NT, Presidency
Other stakeholders	Transnet, NPA

Secure adequate funding for Integrated Rapid Public Transport Networks (rail passenger and road based transport)

After many years of neglect, the existing commuter transport system has reached saturation levels and is unable to satisfy passenger demands while its infrastructure is not able to meet the requirements

of a rapidly changing and modern society. Passenger rail and road transport in South Africa, still faces inadequate investments in rolling stock, infrastructure and operations as well as the loss of appropriate managerial and technical skills. The urbanising metropolitan areas in relation to rail corridors have not kept pace with the rapidly changing landscape resulting in limited coverage in key areas of urban expansion with the consequential loss of significant market share. A prolonged 30 year under-investment has resulted in levels of service experiencing continued decline, due to reduced availability of reliable rolling stock, where the condition of the rolling stock is deteriorating faster than the rate of overhauls undertaken.

The Public Transport Infrastructure and Services Grant for the 2010 FIFA World Cup created an enabling environment for improving public transport operations and infrastructure development. This intervention has provided a solid foundation for the prioritisation and implementation of integrated public transport solutions for improved mobility. In this context, the Moloto Rail Corridor has been prioritised for construction to facilitate the development of rural commuter rail. The initiative will help to bring to fruition the integration of the travel chain between rail, buses and taxis as envisaged in the Public Transport Strategy.

Furthermore, there are plans to extend the Integrated Rapid Public Transport Networks systems, for both Bus Rapid Transport and rail, to other areas of demand. Currently these operations are only in the Johannesburg, Nelson Mandela Bay and Cape Town cities. A full rollout of Phase 1 is under way for completion and funding allocations over the MTEF period are R12,3 billion for the road based transport and R16,6 billion for rail.

The Passenger Rail Agency of South Africa (PRASA) has targeted six category A and five category B corridors, having 500 new coaches and 9400 signalling elements by 2030. The available funding for rail passenger transport over the MTEF period is R16,6 billion, of the required R23,4 billion, with the current backlog being R109 billion.

The disintegration of passenger and freight rail services and the lack of a Transport Regulator to allow for integrated services have impacted negatively on the operational efficiencies of both passenger and rail services e.g. network access. Under-investment in rolling stock has resulted in passenger rail and road services not being able to meet the required customer demand and service. This is further impacted by the delayed integration of operations (travel chain) as per the mandate of the Public Transport Strategy (2006), the key thrust of which is to optimise and transform the bus sector, implement the taxi recapitalisation programme, etc.

Lead department	Department of Transport
Other departments	NT, provincial departments
Other stakeholders	Metros

Secure adequate funding for Integrated Rapid Public Transport Networks (rail passenger transport)

Currently, the Moloto Rail Corridor is prioritised to provide rural rail passenger services. The Department of Transport has also prioritised 11 other passenger rail corridors to be provided with 500 new coaches and 9400 signalling systems by 2030. Over the MTEF period an amount of R16,6 billion has been allocated from the required R23,4 billion resulting in a backlog of R6,8 billion.

Lead department	Department of Transport
Other departments	NT, Presidency
Other stakeholders	PRASA

Secure adequate funding for Integrated Rapid Public Transport Networks (road based transport)

Currently BRT infrastructure and services have been implemented in Johannesburg, Cape Town and Nelson Mandela Bay. There is a need to extend the service to cover other transport corridors which are part of the overall Integrated Rapid Public Transport Networks as per the Public Transport Action Plan of 2007–2010.

Lead department	Department of Transport
Other departments	NT, Presidency
Other stakeholders	Metros, SANRAL

Operational efficiency

Ports

Transnet has invested a total of R93,4 billion over the next 5 years in its capital expenditure programme. Of this amount R24,7 billion will be spent on ports, with the aim of enhancing the provision of port infrastructure to meet the current and future demand. The two main objectives with regards to operational efficiencies are:

1. To improve the productivity of container handling and operations within all the sea ports in the country. Specifically the target is to increase the current movement of 22 containers per hour to 40 moves per hour by 2014.
2. To improve the ship turnaround time in the sea ports from the current 48 hours to 38 hours by 2014 focusing on the Durban Container Terminal, as it is the busiest port in the southern hemisphere in both tonnage and value.

Lead department	Department of Public Enterprises
Other departments	DOT, NT, Presidency
Other stakeholders	Transnet, ports authority, NPA

Rail

Currently, the rail market share is approximately 14% of the total land freight movement with the remaining 86% tons moved by road. This clearly indicates the loss of freight volumes from rail to road; however, with improved investments by Transnet, the rail market share is continuously improving. From the total Transnet capex of R93,4 billion, R54,6 billion is earmarked for investment in the rail freight sector with the following objectives:

1. To improve the rail market share, particularly in relation to corridor traffic from 3% in 2008 to 6% by 2012 and 10% by 2014.

2. To improve service reliability within the rail sector to reduce train cancellation, derailments and delays in scheduled departure and arrival times. No specific performance targets have been set and further engagement with Transnet will take place in this regard.

Lead department	Department of Public Enterprises
Other departments	DPE, NT, Presidency, Economic Development
Other stakeholders	Transnet

Funding framework

Transport infrastructure development has benefited from the R842 billion Government investment in infrastructure which has enabled the implementation of major transport projects such as the Gauteng Rapid Rail Link - Gautrain (R23 billion), the revitalisation of rolling stock and locomotives for PRASA, the Public Transport Infrastructure and Systems Grant (R9 billion) and off-balance sheet investment in airports infrastructure development and the Gauteng Freeway Improvement Project (R22 billion). Owing to the underinvestment in infrastructure over the past three decades, there are still significant infrastructure funding backlogs.

Project Details

Major capital projects	Road km installed	Total costs (est.) (R billion)	Funding secured (Yes/No)	Funding source	Completion date
Roads					
Gauteng Freeway Improvement Project (GFIP)	185 km (ph1) 375 km (ph2)	23 (ph1) 33 (ph2)	Yes No	Debt Debt	2010 (ph1) 2020 (ph2b)
N2 Wild Coast	560 km	12	No	Private sector equity/debt	2018
Winelands	85 km	10	No	Private sector equity/debt	2015
Integrated Rapid Public Transport Networks	2-300 km of trunk BRT	12.3	Yes	PTIS Grant	5 cities – by 2014
Maintenance & refurbishment projects					
Rehabilitation: Coal haulage routes	2156 km	17	Partial	Coal haulage levy, Fiscus and Eskom contribution	
Maintenance		67	R150 b MTEF	MTEF: R41b per annum	

Major capital projects	Total costs (est.) (R'bn)	Funding secured (Y/N)	Funding source	Completion date
Ports				
Containers				
Construction of Port of Ngqura	3,5	Yes	Debt & Retained Earnings	2010
Ngqura container terminal development	5,3	Yes	Debt & Retained Earnings	2011
Durban harbour entrance channel widening and deepening	3,4	Yes	Debt & Retained Earnings	2010
Durban container terminal reengineering	1,9	Yes	Debt & Retained Earnings	2011
Durban berth: deepening of container berths 101 to 103 (Pier 1)	2,5	No	Debt & Retained Earnings	Project commencing in the 2011/12 financial year
Cape town container terminal	4,4	Yes	Debt & Retained Earnings	2011
Break bulk				
Reconstruction of sheet pile quay walls at Maydon Wharf – Durban	1,6	Yes	Debt & Retained Earnings	2012
Dry bulk				
Dry Bulk Terminal (DBT) refurbishment and replacement of equipment	1,7	Yes	Debt & Retained Earnings	
Freight rail				
Coal line expansion	3,1	Yes	Debt & Retained Earnings	2015
Iron ore line expansion	4,2	Yes	Debt & Retained Earnings	2013
General freight business	3,2	Yes	Debt & Retained Earnings	2012
Re-instatement of all closed and lifted branchlines	64	No	Private investment via concessions	2014
Maintenance & refurbishment				
Capitalisation of infrastructure, wagon maintenance and locomotive change outs on core network	23,1	Yes	Debt & Retained Earnings	Ongoing
Capitalisation of maintenance on branch lines	1,0	Yes	Budget request	Ongoing

Output 4: Maintenance and supply availability of bulk water infrastructure

To support South Africa's growth and development path, there must be sufficient water for the country to achieve its economic growth targets. At the same time, every person in South Africa must have access to potable water. These two goals must be achieved without compromising the ecological sustainability of the resource. Rigorous water assessment studies referred to as Reconciliation Strategies are undertaken in order to achieve the reconciliation of supply and demand for both water scarce areas as well as those experiencing relatively high levels of water demand. These strategies aim to ensure the supply of water at adequate levels of assurance within the constraints of affordability and appropriate levels of service to users and protection of current and possible future water resources. Due to an uneven distribution of water resources it is often necessary to transfer water across boundaries of water management areas.

The notion of water for development alludes to the role of water in the alleviation of poverty and people's constitutional rights to have access to a source of safe and reliable drinking water. Where a community cannot be serviced by a large-scale infrastructure project due to the cost of such an intervention (for example, pumping water to mountain-top communities at higher altitudes), then small-scale schemes must be planned and implemented. Where large-scale infrastructure could solve local water scarcity, such as the De Hoop Dam, the necessary planning and resourcing must be undertaken and interim measures introduced to compensate for the long lead-times. There is also a need to prioritise schemes in areas with resource development potential that coincide with areas with high service backlogs. It will also support sector plans where water use for growth purposes can simultaneously support water use for development purposes. The Department of Water Affairs (DWA) will seek out and support interventions that support the dual goals of water for growth and development as one goal should not be at the expense of the other.

The National Water Act (No 36 of 1998) provides for the establishment and management of infrastructure for the collection and delivery of untreated water as Government Water Works. This infrastructure typically comprises dams, tunnels, pipelines, canals, pump stations and associated infrastructure that spans the length and breadth of the country and is an essential life-line for industry, including users of national strategic importance such as Eskom power stations and Sasol, to agriculture, and to water service authorities which are responsible for treatment and onward delivery for household and commercial purposes. The ability of this infrastructure to perform effectively, in the context of the vagaries of rainfall patterns, is a matter of national consequence, with potential impacts on the economy, environment and the quality of life of people. A large percentage of national water resource infrastructure is approaching the end of its useful life and requires rehabilitation/refurbishment to extend the useful life.

Apart from ensuring water availability for growth purposes, the DWA is very mindful of water use behaviour that impacts negatively on both water resource quantity and quality. It is currently exploring a potential mix of mechanisms to change this behaviour, which include regulatory instruments, market-based instruments, self-regulation, and awareness and education, and it will match appropriate mechanisms to mitigate offending behaviour. The DWA is satisfied that it is taking the required course of action to ensure that it has the right kind of information at its disposal to make better informed and calculated decisions and trade-offs with respect to water in support of cross-sectoral planning and development initiatives.

New augmentation schemes implemented

The new schemes are to ensure the availability of sufficient supplies of water to support the growing economy and increased water demand for social needs. Seven (7) new bulk water augmentation projects are to be implemented. These projects will make additional water available to the energy, industrial, agricultural and domestic sectors in various parts of the country. These projects include three projects to augment water supply to existing and new coal-fired power plants of Eskom i.e. Medupi, Kusile, Duvha and Matla. Additional water for domestic use in the supply area of Umgeni Water will be provided by the construction of a new dam and conveyance infrastructure and by raising the wall of an existing dam on another river. A storage dam, bulk raw water distribution system and regional bulk infrastructure in the Sekhukhune District will make much-needed water available to domestic users and new mining development in this resource-rich part of the Limpopo Province. An old dam on the Olifants River (Western Cape) requires remedial work to ensure it is structurally safe and at the same time a 13 metre raising of the wall offers a financially viable solution for providing additional water for the development of irrigation farming by resource-poor farmers.

Lead department	Department of Water Affairs
Other departments	NT
Other stakeholders	Water services authorities, water boards

New regional bulk water infrastructure systems developed

This output is aimed at improving the availability and supply of bulk potable water for socio-economic and development initiatives and therefore regional bulk infrastructure schemes need to be implemented. A total of R4.4 billion over the Medium Term Expenditure Framework (MTEF) will be invested.

Lead department	Department of Water Affairs
Other departments	NT
Other stakeholders	Water services authorities, water boards

Existing water resource infrastructure maintained

Ensuring the security of water supply requires maintenance and periodic rehabilitation of existing water infrastructure. A survey completed in 2008 on the condition of 264 schemes, with a replacement value of R123 billion, identified that a R10 billion backlog with respect to maintenance and rehabilitation of national water resource infrastructure had developed. This backlog is currently posing an unacceptably high risk to sustained water supply to strategic installations like Eskom and other domestic and industrial users. For the years up to 2014 an amount of R4 billion will be spent on renewal programmes designed to reinstate the service potential of assets at the end of their service life. Whilst this work

is undertaken the provision of water will only be interrupted with the concurrence of the users.

Lead department	Department of Water Affairs
Other departments	NT, DAFF, DPE
Other stakeholders	SOEs, mining companies

Regulation of water sector improved

The establishment of an independent economic regulator will ensure efficient pricing in the total water value chain. This means that water tariffs should be sufficient to cover the full operation and maintenance cost of infrastructure and at the same time it would be the responsibility of the regulator to ensure that inefficiencies in the water supply sector are not passed on to consumers.

Lead department	Department of Water Affairs
Other departments	DED, NT, Presidency
Other stakeholders	Water boards

Backlogs in the issuing of licences removed

The aim is to improve efficiencies in processing licences that would create an enabling environment to meet the economic growth and development imperatives of the country. An amount of R8 million has been allocated to address the backlog in 2010/11.

Lead department	Department of Water Affairs
Other departments	Environmental Affairs
Other stakeholders	Water services providers

Raw water pricing strategy and funding model reviewed

The current raw water pricing strategy does not allow recovery of sufficient income to ensure that the water infrastructure is adequately maintained. The revision of the raw water pricing strategy should ensure that tariffs are sufficient to cover the costs of water infrastructure maintenance, renewal programmes designed to reinstate the service potential of assets at the end of their service life and development of new projects to meet social needs.

Lead department	Department of Water Affairs
Other departments	NT, DAFF, CoGTA, Presidency, Economic Development
Other stakeholders	Eskom

Project Details

Major capital projects	Total costs (est.) (R'bn)	Funding secured (Y/N)	Funding source	Completion date
Olifants River Water Development • De Hoop Dam • Bulk distribution system	 3,1 13	 Y N	 Fiscus Fiscus/debt	 2013 2014
Mokolo-Crocodile River Augmentation	16	Y (fiscus) N (debt)	Fiscus/debt	2016
Mooi–Mgeni Transfer Scheme	1,7	Y	Debt	2013
Komati River Water Augmentation	1,4	N	Debt	2013
Raising of Clanwilliam Dam	2	Y	Fiscus	2016
Various bulk water services infrastructure systems (excl. Water Boards)	9,7	Y	Fiscus	2014
Bulk water services infrastructure for Water Boards	11	Y	Budget allocation	2014
Rehabilitation of existing water resource infrastructure	10	Y	Fiscus/revenue	2014

Output 5: Communication and information technology

Increase broadband penetration

Acknowledging that modern ICT networks are based on broadband technologies and the need to ensure that infrastructure in South Africa remains responsive to the requirements of a growing economy, in this output the aim is to expand the current ICT networks operated by the various licensees to increase the broadband penetration in South Africa. The increase in demand for broadband services will in itself be a driver for more competitive offerings in the market. The intention is to also realise the socio-economic benefits of broadband by improving and increasing the efficiency of health, education and other government services. This will be driven by a Broadband Intergovernmental Implementation Committee to co-ordinate and oversee all broadband interventions throughout the three spheres of Government.

Lead department	Department of Communications
Other departments	DPE, Presidency, DPSA
Other stakeholders	INFRACO, Sentech, USAASA, SITA

2010 FIFA World Cup legacy projects

The legacy of broadband infrastructure and services deployed for and during the 2010 FIFA World Cup requires harnessing and redeployment of these resources to provide increased bandwidth capacities to the host cities, which will contribute to a more responsive infrastructure network and access including rural areas. The increased bandwidth capacities on the submarine cable infrastructure also contribute to the wholesale bandwidth capacities. The resultant increase in bandwidth capacities and access will contribute to economic growth as it will result in increased broadband connectivity for businesses, residential and rural schools etc.

Lead department	Department of Communications
Other departments	NT, Presidency
Other stakeholders	Telkom, Sentech, relevant cities

Digital Terrestrial Television (DTT) infrastructure rollout

This output addresses the availability of spectrum for other applications including broadband due to the fact that DTT is more spectrum efficient than analogue television, so that less spectrum is required for DTT. This will result in spectrum becoming available for other applications including broadband. New applications, such as broadband, have the potential to support economic growth. Fewer DTT transmitters will be required at each transmitting station resulting in lower operational costs, lower power consumption and a reduced carbon footprint thereby making a positive contribution to climate change. The establishment of digital television broadcasting transmitters at Sentech transmitting stations and the acquisition of appropriate set top boxes that enable viewers to view the digital signals on their existing analogue television receivers will allow analogue television signals to be switched off within agreed time scales.

Lead department	Department of Communications
Other departments	NT, Presidency
Other stakeholders	Sentech, SABC, other television stations

Project Details

Major capital projects		Total costs (est.) (R'bn)	Funding secured (Y/N)	Funding source	Completion date
2010 Legacy capital projects					
Telkom		1,0	Y	Fiscus	Mar 2011
Sentech		0,2	Y	Fiscus	Mar 2011
Other major projects					
SABC Technical		1,2	Y	Fiscus	MTEF
Sentech Digitalisation		2,3	y	Own/fiscus	MTEF
South African Post Office		2,7	Y	Own	MTEF
Universal Services Agency Fund STB Ownership Scheme		3,6	Y Part	Fiscus	MTEF
Infraco	National long distance	2,0	Y	Fiscus	2013
	West African Cable System	0,6	Y	Own/fiscus	2011

Actions needed to achieve each output

Output 2: Ensure reliable generation, distribution and transmission of electricity

What will need to be done differently?

The creation of an independent institutional structure to undertake long-term planning and the buying of power from private sector participants in the electricity sector, and the creation of a conducive regulatory environment, will clarify the roles of Eskom and the private sector in a manner that balances the provision of infrastructure to meet our growth demands.

The improvement in the reliability of distribution infrastructure can be achieved through the reduction in maintenance and refurbishment backlogs. Critical infrastructure that needs urgent attention can be identified by mapping its geographical location, so that interventions can be targeted on a prioritised basis. A plan will be devised to fund the interventions through a combination of fiscal allocations and the electricity tariff.

Regulatory and legislative framework

Legislation creating an Independent System and Market Operator (ISMO) will have to be promulgated to ultimately separate the entity from Eskom. There is a need to align the proposed ISMO legislation with the Electricity Regulation Act and regulations promulgated thereunder.

In addition to the creation of the ISMO, it is critical to create a regulatory environment that facilitates the introduction of viable independent power producers (IPP) and to start the process for participation by IPPs during 2010. To achieve this, a framework for transparent and standardised risk allocation in the Power Purchase Agreement (PPA) that the ISMO enters into will be developed to ensure streamlined approval of PPAs.

Institutional and management arrangements

The proposed ISMO will be established in phases to minimise disruption and create a controlled environment. The interim arrangements will enable the procurement of IPPs under a separate governance process that also protects Eskom from taking on liabilities outside its control. This will improve procurement from IPPs. The ring-fenced entity will have an independent board and management structure.

Funding framework

The creation of the ISMO will require credit enhancement support from the State in order to facilitate the execution of contracts to procure power from IPPs. The extent of government support is dependent on the amount of power that will be procured through the ISMO and this will be determined as part of the process to develop the funding model relating to the build programme.

The reduction of distribution infrastructure maintenance backlogs to R15 billion by 2014 can be achieved through a tariff-funded programme, which would be earmarked for the purpose, and without any fiscal support. Municipal distributors will access the funding subject to agreeing to use the funds on the conditions set out for them. As an illustration, a 1 c/kWh refurbishment levy could provide about R600 million annually.

Output 3: Ensure maintenance and strategic expansion of road and rail network, operational efficiency, capacity and competitiveness of sea ports

What needs to be done differently?

1. The introduction of competition within ports and rail sectors will be implemented in phases, starting with ring fencing and concessioning of the secondary rail network within Transnet over a 5 year period.
2. The establishment of an independent Economic Rail Regulator to oversee competition within the rail system.
3. The inclusion of targets and indicators for Outcome 6 in the performance agreements of State Owned Entities.
4. With regards to public transport, the Public Transport Infrastructure and Services Grant for the 2010 FIFA World Cup created an enabling environment for improving public transport operations and infrastructure development. As part of the 2010 FIFA World Cup legacy, the PTIS allocation will need to be used to extend services to the rest of the Integrated Public Transport Network.

Regulatory and legislative framework

The institutional and resource capacity of the regulators needs to be strengthened to enhance their effectiveness as they deal with agencies that are well resourced and capacitated. A gap in the transport sector exists in the area of rail economic regulation where there are currently two main players i.e. Transnet and PRASA moving freight and passengers on the country's rail network. Economic regulation of the rail sector is required to ensure in part equitable access to the country's primary network by the different users. Accordingly, a new Rail Economic Regulator will be established. The long outstanding Rail Policy and Act would also have to be fast-tracked to give impetus to rail restructuring, investments and operations. There is a need for a policy decision to establish a transport sector regulator as opposed to sub-sectoral regulators.

Institutional and management arrangements

The Departments of Transport and Public Enterprises share roles and responsibilities for various aspect of transportation in the country. Whilst the Department of Transport develops policies, plans and strategies for transport, through its shareholding with State Owned Enterprises, the DPE is responsible for guiding implementation and operations.

The interventions to discuss and address existing institutional arrangements will be co-ordinated in the various governance structures of the Cluster, as proposed under the Governance and Reporting Arrangement of the Delivery Agreement. Cross cutting and policy issues will be dealt with in the same Cluster. Linkages will also be made with the Economic Sector and Employment Cluster (Outcome 4) to deal with issues relating to social infrastructure.

Funding framework

Resources will be mobilised from both internal and external stakeholders (private sector and SOEs). This process is recommended to be led by the National Treasury on behalf of the Infrastructure Development Cluster. For the transport sector, there is limited funding with regards to the secondary road infrastructure from the fiscus and no ring-fenced funding allocation has been made for the secondary rail network, which Transnet currently funds from its balance sheet, and, through the concessioning of rail branch line process, will fund and sustain itself. Currently an amount of R54,6 billion over the next five years has been allocated for freight rail; R16,6 billion for passenger rail over the MTEF period; R67 billion for roads over the MTEF period and R24,7 billion for ports. There is a R72 billion shortfall for secondary road maintenance and a R1,2 billion shortfall for the upgrading of the railway branch lines. In public passenger rail there is a backlog of R109 billion for rail passenger transport and a shortfall of approximately R4 billion for BRT road based transport linked to the Integrated Rapid Public Transport Networks. In total, the funding available is approximately R162,9 billion for transport infrastructure as indicated above, with a total shortfall of approximately R186,2 billion.

Output 4: Maintenance and supply availability of bulk water infrastructure

What will need to be done differently?

In development corridors where there is recognised potential for economic development, funding should be made available for the establishment of new water resource infrastructure that could serve as a catalyst for development. The investment cost could

be recovered from commercial users later by the levying of water tariffs to cover for the unit cost of delivering the water.

There is a need to align the planning processes for water services and water resources to enhance the development of provincial regional bulk master plans. Also, the implementation delivery models for regional bulk water schemes have been revised to consider the use of Water Boards as implementing agents and also the build-operation-train-and-transfer (BOTT) approach.

The Water Pricing Strategy needs to be revised to secure funds for timeously undertaking maintenance and refurbishment of existing water resource infrastructure. Currently the water tariffs for the agriculture sector are too low and do not allow for full recovery of operation, maintenance and depreciated costs. This is the result of indirect subsidies introduced in the form of low tariffs to ensure food production.

The licensing processes need to be streamlined by having dedicated regional units with defined roles and responsibilities. This will improve the efficiency in processing licences and thus create an enabling environment for economic growth and development initiatives for the country. Also, there is a need to create a platform for co-operative governance in the evaluation of water use licence applications to improve the turnaround times in decision making.

Evaluation of the legislative environment and the existing regulatory framework

The regulatory framework needs to be improved through the establishment of an economic water regulator. The existing water legislation and the Municipal Systems Act needs to be reviewed to clarify powers and functions of municipalities, and roles and responsibilities of regional bulk water utilities in the implementation process and the management of regional bulk supply. Changes are required in the Division of Revenue Act (DoRA), to clarify ownership of infrastructure funded through the Regional Bulk Infrastructure Grant (RBIG). The review of the Municipal Financial Management Act (MFMA) and DoRA is also essential to allow for borrowing power for municipalities and the use of grants to leverage private sector funding to ensure speedy
service delivery.

Legislative review is required to address the equitable allocation of water. The regulation of water tariffs throughout the water value chain needs to be addressed. The provisions of the current water pricing strategy are impacting negatively on available funds for maintenance and refurbishment of existing infrastructure. Not enough revenue is collected. The shortcoming that needs to be fixed is the indirect subsidies for the agriculture sector in the form of low tariffs that are insufficient to cover the operation and maintenance cost. The proposal is for transparent subsidies by the appropriate sector i.e. Agriculture which is responsible for food security. The Water Pricing Strategy is to be revised.

More stringent regulations need to be promulgated through the Water Services Act compelling water services authorities to invest in water services infrastructure (i.e. asset management, operation and maintenance). In addition, regulations need to be promulgated through the Water Services Act and the Municipal Finance Management Act, regarding the financial efficiency of water services, particularly with regards to reducing Non-Revenue Water.

The existing institutional arrangements, management systems, processes .and skills

The re-organising of the National Water Resource Infrastructure Branch within DWA into a properly structured trading entity or Government Component should be considered. This will enable the establishment of a financially viable unit to manage the water resource infrastructure assets of Government.

There is a disjuncture in the current institutional water services delivery structures. This is further complicated by the limited scope and areas of operation of existing regional water utilities/ water boards as they do not cover the whole country. Therefore, a review of scope and operational area is required.

An independent economic institution for the regulation of the water sector is required. The powers delegated to the institution would include amongst others arbitrating on tariff disputes between users and suppliers of water.

The Project Implementation Methodology adopted for new water augmentation projects is based on Project Management Body of Knowledge (PMBOK). There is a shortage of staff for this function and capability of existing staff needs to be developed. The procurement systems and processes need to be enhanced to meet the requirements of a fast track build programme. This includes processes to improve capacity building of SMMEs in accordance with BBBEE requirements.

The current reporting systems for infrastructure funding need to be aligned for efficient reporting.

There is a need to enhance skills and capacity for efficient implementation of regional bulk water infrastructure schemes and asset management thereof. The skills required include, but are not limited to, planning, project management, engineering, operations and maintenance as well as water services management.

DWA will have to investigate the range of capabilities and resources required to establish an economic water regulator and budget for the required resources and build or acquire the necessary capacity over the medium term.

The support system for water revenue collection needs to be enhanced. Currently water users are registered on the WARMS system. The system registers the volumes allocated to each user and this information interfaces with the SAP system which generates invoices and statements. Debt collection has been a problem. The implementation of the Billing Agency Policy should go a long way in enhancing debt recovery.

Funding framework

New water augmentation projects that are commercially viable are to be funded by the procurement of loans backed by secure water supply agreements. Full costs are to be recovered by levying water

tariffs in accordance with the Water Pricing Strategy. New water augmentation projects that are to meet both social and commercial needs are to be funded partly from the fiscus (social portion) and loans (for the commercial portion). Full costs are to be recovered for the commercial portion by levying water tariffs in accordance with the Water Pricing Strategy. Social users are to be charged in accordance with the Water Pricing Strategy which currently allows for recovery of operation and maintenance cost, depreciation and a 4% Rate of Return on investment for some users.

For the implementation of new regional bulk infrastructure systems grant funding from the fiscus is made available for the cost associated with the social component; for the balance, considered as the economic component, other sources of funding are employed which could be funds provided by Municipalities from own budgets or from loans, or funding raised by Water Boards. When a grant is provided by one fund of the State, no further co-funding with another State grant can be used.

The R4 billion reduction of the backlog on the maintenance and rehabilitation/refurbishment of bulk national water resource infrastructure is to be partly funded from an allocation by the fiscus to DWA and the balance from revenue collected through the sale of raw water. It is anticipated that the review of the Water Pricing Strategy will in future provide sufficient funding to wipe out the current backlog.

The cost to establish the economic water regulator, to review the Water Pricing Strategy and to deal with the backlog in water licences will be funded within the baseline allocation of the DWA. The funding situation can be summarised as follows:

For 7 new augmentation projects	Amount in million Rands
Projected cost to completion	25 724
Projected funding required from 09/10 to 13/14	21 035
Loan funding	11 555
Vote 37 requirement	9 480
Vote 37 funds spent up to 31 March 2010	1 360
Vote 37 funds allocated 2010 ENE	2 306
Vote 37 funds to be allocated	5 184

For new regional bulk water infrastructure: The baseline allocation for the 2010/11 MTEF is tabled below:

Region	Budget allocation			Total budget allocation	% of total
	2010/11	2011/12	2012/13		
Total	893 000 000	1 675 340 000	1 849 107 000	4 417 447 000	100.0%

The budgets allocated and projected for 2013/14 are as follows:

	2010/2011 (R million)	2011/2012 (R million)	2012/2013 (R million)	2013/2014 (R million)
Funds required	884	1 078	1 188	1 100
Funds allocated in 2010 ENE	636	715	915	1 100
Funds allocated in 2009 ENE	320	363	273	-
Total allocation	956	1 078	1 188	1 100

Output 5: Communications and information technology

What will need to be done differently?

The establishment of the Broadband Inter-Governmental Implementation Committee will ensure a co-ordinated approach by Government and SOEs to broadband implementation initiatives. The Committee will provide oversight over all broadband initiatives of government and SOEs including addressing all challenges associated with implementation of broadband initiatives.

Digital television transmitters and associated ancillary transmission equipment must be purchased by Sentech and installed at various transmitting stations in accordance with a pre-determined rollout plan. Viewers must purchase appropriate set top boxes to enable them to receive the digital transmissions on existing analogue television receivers.

Evaluation of the legislative and regulatory environment

The approved Broadband Policy and the National Broadband Act will provide the necessary policy and legal framework to facilitate the development of requisite infrastructure to facilitate a positive impact on economic growth.

The Electronic Communications Act, Digital Broadcasting Migration Policy, Radio Frequency Spectrum Policy, gazetted Digital Broadcasting Regulations and published Digital Broadcasting Frequency Plan for the rollout of digital terrestrial television broadcasting, support the introduction of digital technologies.

Evaluate the existing institutional arrangements

To ensure national coordination of all government broadband implementation initiatives, the Broadband Inter-Governmental Implementation Committee will need to be empowered to approve all government Broadband projects and resources associated therewith, including funding aspects. The Committee needs to be capacitated accordingly to ensure delivery of this objective in line with its mandate.

The DoC has established a special 2010 Football World Cup unit in 2006 to oversee and implement appropriate projects related to World Cup guarantees. Sentech has prepared a digital television broadcasting rollout plan to achieve the specified targets. The implementation of this plan is monitored by the Department of Communications.

Evaluate the management systems, processes and skills

The Broadband Inter-Governmental Implementation Committee will inter alia develop the Broadband Implementation Plan. To this end, technical, financial and project management skills will be critical for the committee, provinces and local authorities. Where such expertise is lacking, capacity to second or redeploy must be available. In implementing 2010 legacy projects and given the technical complexities involved, dedicated technical resources within the DoC will be utilised and where necessary relevant expertise will be engaged for specific tasks such as design, integration etc. The project management approach will be used to ensure that the project remains within scope and budget. The methodology will include close monitoring of implementation and expenditure. Existing management systems, processes and skills will be applied. However the project will adhere to project management principles.

Funding framework

The establishment and operation of the Broadband Inter-Governmental Implementation Committee and its operations as well as the Development of the National Broadband Legislation are provided for under DoC funding in the current financial year.

Funding of broadband implementation initiatives will reside within Provincial and Local budgets. Allocation of funds to these broadband projects, shall be in line with the Broadband Inter-Governmental Implementation Committee's programme. This will ensure that coordination takes place at Local and Provincial levels, which will result in a more effective allocation of resources. Total budget required will only become available when the broadband implementation plan has been developed and costed.

With regard to the implementation of e-Connectivity projects, no funding is available for this project in the DoC budget. The e-Connectivity plan will outline the scope of projects and associated costs. Potential funding for e-connectivity could be through a combination of MTEF allocation and Universal Service Agency Fund (USAF).

In ensuring access to Digital Broadcasting Services by all South African TV owning households, Sentech has budgeted R1 385 700 000.00.

Activity	Funding
Ensure 60% population coverage	R414 800 000.00
Ensure 80% population coverage	R456 200 000.00
Ensure 96% population coverage	R514 700 000.00

Funding for DTT rollout is sourced from the Department of Communications in accordance with the Sentech business plan for DTT.

Output 6: Develop a set of operation indicators in each segment

The Output however, goes further to indicate that for the enhancement of the quality of regulation across the infrastructure network, it is proposed that the Cluster study the idea of a Single Regulatory Coordinator under the Competition Commission, and bring proposals to Cabinet.

This Delivery Agreement will not go into exact details in terms of what needs to be done, how it will be done and the time frames attached thereto. The Cluster has thus far discussed the problem of weak regulators, specifically when dealing with the ICASA Amendment Act, earlier in the year. There was acknowledgement that some research work had been done by the Presidency in term of Economic Regulators, which was presented to the Cluster with specific recommendations being given.

The Cluster will therefore further interrogate the matter and examine the possibility of recommending that information that emerged out of the study into the Framework for Economic Regulators be further interrogated to determine if there is sufficient data to develop proposals for Cabinet to consider. Where additional information is required, the Cluster will commission further work to be done within a specific time frame, based on available resources, to enable the development of comprehensive proposals on the feasibility of a Single Regulatory Coordinator under the Competition Commission.

Indicators, baselines and targets for outcome

See Matrix (Appendix A).

Synopsis of key activities

1. Improving competition and regulation

1.1. Review of transport industry structure to consistently drive the principle of separating policy from regulation and from operations.

1.2. Measures to implement the Ports Act and the introduction of competition within ports.

1.3. The completion of the Rail Policy.

1.4. The completion of the Rail Act which establishes the framework for economic and safety regulation as well as competitors within the rail sector.

1.5. Create regulatory and institutional structures for the introduction of viable Independent Power Producers (IPP) and start process for the participation of IPPs in 2010.

2. Ensure reliable generation, distribution and transmission of energy

2.1. Develop a funding and implementation plan to reduce the distribution infrastructure maintenance backlogs of R27.4 billion to R15 billion by 2014.

2.2. Household access to electricity should be 92% by 2014.

2.3. Develop a funding model for electricity generation/build programme to ensure security of supply.

2.4. Long-term energy mix diversification to address the security of energy supply and requirements for renewable energy.

2.5. Coal haulage logistics

2.6. Restructuring of the Electricity Distribution Industry (EDI).

2.7. Setting cost reflective tariffs while cushioning the poor from increasing electricity costs.

3. To ensure maintenance and strategic expansion of our road and rail network, and the operational efficiency, capacity and competitiveness of our sea ports and rail

3.1. Increase the market share of total freight to rail to an annualised 250 mt from the current 177 mt by 2014.

3.2. Investigate the feasibility of standardising and linking rail tariffs to inflation (note sub-output revised wording different in Performance Agreements).

3.3. Introduction of private sector investment in rail and secure adequate funding for Integrated Rapid Public Transport Networks.

3.4. Introduction of private operators at branchline level.

3.5. Implement the National Ports Act and create transparent subsidies between ports and rail infrastructure.

3.6. Introduce competition for the management of container terminals.

3.7. Complete a long term national freight network plan.

3.8. Improve productivity at ports.

4. Maintenance and supply availability of bulk water infrastructure

4.1. New augmentation schemes implemented.

4.2. New regional bulk water infrastructure systems developed.

4.3. Existing water resource infrastructure maintained.

4.4. Regulation of the water sector improved.

4.5. Backlog in the issuing of water licences removed.

4.6. Raw water pricing strategy and funding model reviewed.

5. Information and communication technology

5.1. Increase broadband penetration.

5.2. 2010 Legacy projects implemented.

5.3. DTT rollout.

Risks, constraints and mitigation strategies

1. Energy

1.1. Supply and Demand Mismatch

- An affirmative and timely decision on Kusile supported by a sustainable funding plan is required to ensure adequate system security. In the absence of an affirmative decision, an alternative to replace Kusile will be required or alternatively procure Kusile as IPP to remove the funding burden from Government, however this has implications for long lead time components.
- Facilitation of IPP introduction through a credible procurement function (Ring-fencing of procurement function within Eskom), and finalise buying arrangements for RE IPPs as another key requirement to ensure that there is enough capacity for the future.

1.2. Energy Mix

The following would be required to ensure Government's objectives for diversification and mitigation against the environmental impact of coal fired power stations:

- Determine and approve the IRP 2010.
- Decision on Solar Park RE kick-start.
- Possible decision and funding of nuclear.

1.3. Reduction of Maintenance and Refurbishment backlogs in the Electricity Distribution Industry

- Final decision on REDs – Cabinet re-affirmed the decision on six wall-to-wall REDS in 2006. Very little has happened however in terms of implementing that decision. Preliminary assessments indicate that now is not the ideal time to proceed with the decision until the refurbishment and maintenance backlogs are addressed.
- Closure or massive capitalisation of EDI Holdings and REDs.
- Decision on the funding of backlog reductions, which includes the following options: MIG, INEP and other grants, and electricity surcharges to fix distribution is needed even in the absence of REDs. This cannot wait for the implementation of REDS.

2. Transport (Rail)

2.1. The implementation of the branch lines strategy is critical for the achievement of the road to rail migration in the secondary network. In consideration that the Rail Act will take some time to finalise, it is necessary to have some enabling legislation for regulatory oversight on access, infrastructure pricing and tariffs between TFR and new private operators on branch lines.

2.2. A level playing field for road and rail will have to be put in place.

2.3. For increased rail volumes as a result of the revitalisation of branch lines network as feeders to the core network, it has to be assumed that branch lines concessionaires are able to attract volumes back to rail; policy framework is conducive for the rail mode to compete.

2.4. For capacity expansion on bulk lines to de-constrain growth on mining exports, it is assumed that the projects will be attractive for private sector and that private sector funding would follow therefrom.

3. Transport (Ports)

3.1. The creation of transparent cross-subsidies between ports and rail infrastructure will require amendments to the Ports Act.

3.2. Joint venture in Ngqura trans-shipment container terminal will require a global operator that can attract trans-shipment volumes.

3.3. Improvements in productivity in container handling operations and ship turnaround time (STAT) in ports will require the buy-in of labour to meet performance targets.

4. Water

4.1. The development of new augmentation projects for energy, domestic, agriculture and industrial sectors will depend on the availability of funding (fiscus) to meet completion time frames, adequate professional staff to implement, timely environmental authorisations and cooperation of users in concluding Water Supply Agreements.

4.2. The implementation of Regional Bulk Water System might be delayed by escalation costs higher than budgeted, lack of capacity to implement by Water Services Authorities and high levels of water losses.

4.3. The reduction of the current R10 billion backlog on rehabilitation of national dams and water conveyance projects will depend on the availability of skills (e.g. project management and design), timely environmental authorisations and approval to take infrastructure out of commission for long enough periods to do rehabilitation (water users do not have adequate storage to allow sufficient "dry" periods for extensive rehabilitation works).

4.4. The establishment of the Independent Economic Water Regulator to cost reflective tariffs, resulting in resistance from some of the stakeholders. Alternatively, the consumers might have to bear the brunt of increases, if the rates at which municipalities provide water to the consumers is not regulated.

4.5. The revision of the raw water pricing strategy and funding model might result in increases in food prices, as the current water pricing strategy subsidises farmers shielding them from price increases.

Governance and reporting arrangements

1 The Ministers in the Infrastructure Development Cluster will be a Delivery Forum for Outcome 6. Their focus will be on providing guidance and oversight in ensuring the integration and alignment of economic infrastructure interventions, as well as noting constraints to implementation of commitments for Outcome 6 and either approving proposals to address those constraints or elevating them to Cabinet for further consideration and decisions.

Reporting to the Delivery Forum will be workstreams built along specific sectors and distinct Cluster programmes that deal with other enablers to the implementation of Outcome 6. The workstreams will be rolled out as follows:

a) Workstream on Energy, whose focus will primarily be on Output 2: Ensure reliable generation, distribution and transmission of electricity. An Inter-Ministerial Committee on Energy dealing with exactly the same issues is already in place. To avoid duplication, this structure, together with its workstream, will therefore suffice for this particular workstream. The IMC is made up of the Departments of Public Enterprises, Energy, Presidency, Economic Development, Trade and Industry, Water and Environmental Affairs, Cooperative Governance and Eskom. The relevant teams will indicate to Ministers where additional members are required to implement projects relating to this Output.

b) Workstream on Transport and Regional Integration: This workstream will focus primarily on Outcome 3 (To ensure the maintenance and strategic expansion of the road and rail network, and the operations and will be chaired by the Department of Transport. In addition to commitments outlined in this output, focus will also be on regional integration as SADC countries are very crucial as trading partners for South Africa. Infrastructure considerations will therefor require their involvement. Participating Departments will be the Departments of Public Enterprises, National Treasury, Agriculture, Forestry and Fisheries and representatives from provincial Transport departments. Representations from agencies like PRASA, SANRAL and Metros will be considered.

c) Workstream on Water: This workstream will focus on Output 4 (Maintenance and supply availability of bulk water infrastructure), and will be chaired by the Department of Water Affairs. Other Departments that may be part of this workstream will be Public Enterprises, Agriculture, Forestry and Fisheries, Cooperative Governance and National Treasury. Other stakeholders will be Water Boards and other major water service providers where applicable.

d) Workstream on ICT: This workstream will focus on Output 5 (Communication and Information

Technology), and will be chaired by the Department of Communications. Members of this workstream will be the Departments of Public Enterprises, Trade and Industry and Presidency. The involvement of entities like Sentech and InfraCo might be considered.

e) Workstream on Funding: Owing to the fact that funding is also a major issue in economic infrastructure, there is a need to focus attention on resolving funding constraints by looking at other innovative mechanisms to address issues of funding large infrastructure. National Treasury will chair this workstream, which will have members from the Departments of Public Enterprises, Communications, Water Affairs and Transport.

2. It is expected that Departments in each workstream will be responsible for ensuring the implementation of projects they lead, while the Chairing Department will play a coordinating role as well as implementing their commitments as outlined in the Output.

3. The workstreams will be structured to ensure that participation is primarily by implementing parties and other parties who contribute to the implementation of specific projects in the Output. Other parties may therefore participate upon invitation or be requested to provide specific information as and when required.

4. The terms of reference for each workstream will be to:
   a) Oversee progress on implementation of project activities as per Output
   b) Provide reports to the Implementation Forum on progress with achieving outcome
   c) Recommend resolutions with regards to identified constraints
   d) Take steps to resolve any blockages, and facilitate a discussion of blockages that require intervention by the Implementation Forum financial implications to the projects

5. Reporting
   a) Each workstream will report to their Ministers on a bi-monthly basis
   b) Workstreams will report to the Delivery Forum on a Quarterly basis
   c) The Cluster Secretariat will consolidate workstream implementation reports into a single Cluster progress report on the implementation of Outcome 6.

6. The Role of the Performance Monitoring and Evaluation Department in respect of the Cluster will be to:
   a) Monitor and maintain reporting systems for the Cluster
   b) Assist in training project managers in the usage of the reporting systems
   c) Conduct an assessment of Cluster reporting against commitments and time frames and identify gaps and deviations as feedback to the Cluster
   d) Update the POA with reports on the implementation of the Outcome.

Signatories to the delivery agreement

Name: _____ Date: _____2010

_____

Minister of Transport

Name: _____ Date: _____2010

_____

Minister of Public Enterprises

Name: _____ Date: _____2010

_____

Minister of Energy

Name: _____ Date: _____2010

_____

Minister of Communications

Name: _____ Date: _____2010

_____

Minister of Water and Environmental Affairs

Appendix A: Results chain

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Outcome 6: An efficient, competitive and responsive economic infrastructure network					
Output 1: Improved competition and regulation					
Sub-output 1.1: Review of transport industry structure to consistently drive the principle of separating policy from regulation from operations					
Milestone indicators in the review of existing policy framework in ports: 1. TOR approved by minister 2. Review committee appointed 3. Draft report completed 4. Submitted to cabinet 5. Cabinet decision	White Paper on Commercial Ports Policy, National Ports Act, draft Maritime Policy	Report and cabinet decision on ports industry structure	DoT departmental reporting		DPE, NT, DoT
Sub-output 1.2: Measures to implement the Ports Act and introduction of competition within ports					
Milestones indicators in the implementation of the Ports Act: 1. Paper on implementation of Ports Act approved by Minister 2. Submitted to Cabinet 3. Cabinet decision 4. Framework published 5. Incorporation of decisions into Transnet shareholder compact and Transnet business plan	Limited PSP in container terminal operations	Economic framework which facilitates private operator at Ngqura published	DoT departmental reporting and parliamentary process		DoT, DPE, NT,
Milestones in the comprehensive review of the Implementation of National Freight Logistics Strategy (NFLS) as it applies to rail: 1. TOR approved by minister 2. Review committee appointed 3. Draft report completed 4. Submitted to cabinet 5. Cabinet decision	National Freight Logistics Strategy (NFLS)	Report and cabinet decision on rail industry structure	DoT departmental reporting		DPE, NT, DTI, DoT
Sub-output 1.3: The completion of the Rail Policy					
Milestones indicators in the reform of the rail industry: 1. Paper on rail economic regulation – Network access, infrastructure pricing and tariffs 2. Draft legislation on industry structure and separation of policy from regulation from operations 3. Minister approved submission to cabinet 4. Cabinet approval of bill for public consultation 5. Bill introduced in parliament 6. Parliamentary approval 7. Rail Act promulgated 8. Rail Economic Regulator established	No rail policy framework	Rail policy promulgated by December 2011 Rail Economic Regulator established by March 2012	DoT departmental reporting and parliamentary process		DoT, DPE, NT,

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Sub-output 1.4: The completion of the Rail Act which establishes the framework for economic and safety regulation as well as competitors within the rail sector					
Finalise Rail Act (as outcome of sub-output 1.2) with inputs from DPE and other stakeholders	No Act	Draft Rail Act by end 2010/11	Draft Act published for comment		DPE, DoT
Milestone indicators in finalising enabling legislation for branch lines: 1. Draft legislation approved by Minister 2. Cabinet approval 3. Released for public comment 4. Parliamentary approval 5. Promulgated	No legislation	Branch lines legislation finalised by end 2011	Government Gazette	The implementation of the branch lines strategy is critical to the achievement of the road to rail migration in the secondary network. In consideration that the Rail Act will take some time to finalise, it is necessary to have some enabling legislation for regulatory oversight on access, infrastructure pricing and tariffs between TFR and new private operators on branch lines.	DoT, DPE
Sub-output 1.5: Presidential report on encouraging competition, Improvement of regulation, and investigation of single regulatory coordinator under the competition commission					
Submission of report to President	No analysis	Report due 2010			IDC Cluster
Output 2: Reliable generation, distribution and transmission of energy					
Sub-output 2.1: Create regulatory and institutional structures for the introduction of viable Independent Power Producers (IPP) and start process for the participation of IPPs in 2010					
Milestone indicators in the introduction of legislation for the establishment of an independent system operator to fast track IPP procurement: 1. Draft legislation approved by Minister 2. Cabinet approval 3. Released for Public Comment 4. Parliamentary Approval 5. Promulgated	No legislation for the establishment of ISMO	Legislation for the introduction of ISMO introduced by 2011	IMC on Energy		DoE, IMC on Energy (DPE, CoGTA, NT, DWA, DEA, DED, Presidency)
Milestone indicators in the establishment of a interim ring-fenced entity within Eskom for IPP procurement: 1. Submission of cabinet memorandum 2. Cabinet approval 3. Instruction within Eskom shareholder compact by Minister of DPE 4. Legislation/Regulation guaranteeing fair purchase of independent power 5. Appointment of board of ring-fenced subsidiary 6. Shareholder compact between Minister of DPE and ring-fenced subsidiary board	Current Eskom structure	Interim ring-fenced ISMO functions within Eskom with approved appropriate governance structures established by 2010	DPE departmental reporting and parliamentary processes	The introduction of ISMO is approved and implemented	DPE, IMC on Energy

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Sub-output 2.2: Develop a funding and implementation plan and reduce the distribution infrastructure maintenance backlogs of R27.4bn to R15bn by 2014					
Milestone indicators in reducing the distribution infrastructure maintenance backlogs: 1. Draft funding and implementation plan on distribution infrastructure maintenance approved by the minister. 2. Cabinet approval of the plan (Mar 2011) Ongoing indicator: Aggregate expenditure on distribution infrastructure maintenance by municipalities and Eskom per period	About R27bn of investment backlog exists in respect of municipal distribution infrastructure rehabilitation, and this is growing annually	Funding and implementation plan in place by March 2011	DoE databases (INEP , EDI Holdings), Eskom , DCoG (MIG database), National Treasury Municipal Expenditure Information		DOE, IMC on Energy
Sub-output 2.3: Household access to electricity should be 92% by 2014					
Number of additional households electrified	80% Households electrified in 2010	92% households electrified by 2014	INEP database and Census 2011	The extent of fiscal allocations does not meet requirement	DoE, DPE, NT, DCoG, DRDLR
Sub-output 2.4: Develop a funding model for Electricity Generation/build programme to ensure security of supply					
Milestone indicators in the development and Implementation of a funding framework for the funding of the Eskom Committed Capital Expenditure programme: 1. Ministerial approval of funding model for Eskom 2. Submission to cabinet 3. Cabinet approval/decision 4. Publication	Inadequate funding model	Funding model in place December 2010	DPE Departmental reporting	Timeous decision making, a of the approved model	DPE, IMC on energy
Sub-output 2.5: Long-term Energy Mix Diversification to address the Security of Energy supply and Requirements for Renewable Energy					
Milestone indicators for IRP: 1. Draft IRP approved by minister 2. IRP released for public consultation 3. Final approval by minister 4. IRP approved by cabinet 5. Published/gazetted Ongoing indicator: 1. Number of additional megawatts installed from: a) Renewable energies b) Conventional sources c) Co-generation	IRP1, which covers short window up to 2013 41 000 MW (conventional)	Extend IRP, covering 25 year window developed by December 2010 Targets as per published IRP	DoE departmental reporting		DoE, IMC on Energy
Number of MW of demand reduced per annum	917 MW saved in 2009	Accelerated 1 million Solar Water Heaters roll-out by 2013 (DoE, DPE, NT) and Accelerated Demand Side Management (MW)	Eskom, municipalities and DoE (Energy Conservation Programme and DSM)	Delays in implementing the DSM programme could result in the re-introduction of load shedding	DoE, DPE (Eskom)

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Sub-output 2.6: Coal Haulage Logistics					
Tonnage of Eskom coal per annum on rail and road	8.8 mtpa of Eskom coal on rail (36.1 mtpa on road) in 2010/11	30.5 mtpa of Eskom coal on rail (11.8 mtpa on road) by 2014/15	Transnet reports; DoT freight data banks; Eskom reports	Commitment to the Transnet/Eskom MOU critical; DPE willing to introduce private investment where Transnet fails to deliver	DPE, DoT
Kilometres of coal haulage roads rehabilitated	Nil	Approx 2400 km	DoT, DPE and DoE departmental reports		DoT, DPE, DoE, Eskom, SANRAL/ Mpumalanga roads department
Sub-output 2.7: Restructuring of the Electricity Distribution Industry (EDI)					
Milestone indicators in investigating the feasibility of proceeding with the restructuring of the electricity distribution industry: 1. Cabinet submission of proposal 2. Cabinet decision on end state of EDI 3. Decision published	Current distribution structure	Decision on the End State of EDI	DoE reporting		DoE, IMC on energy
Sub-output 2.8: Setting cost reflective tariffs while cushioning the poor from increasing electricity costs					
Milestone indicators in the implementation of the Electricity Pricing Policy including strategy to cushion the poor from rising costs of electricity: 1. Cabinet submission of proposal 2. Cabinet approval of proposal 3. Gazetting of pricing policy for implementation and regulation	Wholesale electricity prices are not cost reflective Free basic services (50 KWH per month)	5 year phasing in of cost reflective tariffs up to 2015, including measures to protect the poor			DoE, IMC on energy
Sub-output 2.9: Monitor the Implementation of the Eskom Infrastructure Build Programme					
Completion of approved build plan projects against schedule and budget by Eskom	Demand not met in absence of committed projects	Committed Eskom projects implemented by 2017	Annual reports, DPE Dashboard, Entity reports	Funding model for Eskom is resolved.	DPE, DoE and NT
Output 3: To ensure the maintenance and strategic expansion of our road and rail network, and the operational efficiency, capacity and competitiveness of our sea ports and rail					
Sub-output 3.1: Increase the Market Share of Total Freight to rail to an Annualised 250 mt from the current 177 by 2014					
Market share percentage of freight tonnage moved by rail relative to road.	Corridor traffic on road 213 mt (13%) and rail 45 mt (3%) in 2008	Increase in rail corridor traffic to 6% (2012) and 10% by 2014	Transnet Annual Report; DPE Dashboard; CSIR state of logistics survey		DPE (Transnet)
Tonnage moved on revitalised branch lines	Branch lines net tons per annum is 5.9 mt	Branch lines net tons per annum is 8 mt by 2014/15	Transnet reports; DoT freight data banks; DPE Dashboard		DPE (Transnet)
Report on planned infrastructure investments for rolling stock as part of CSDP	Separate rolling stock investment plans for Transnet and Prasa	Consolidated 15 year fleet procurement plan for Transnet and Prasa	Transnet reports, Prasa reports	CSDP project aims to link SOE planned capex procurement to support the DTI's Industrial Policy Action Plan (IPAP)	DPE (Transnet), DoT (Prasa)

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Sub-output 3.2: Introduction of Private Sector Investment in Rail and secure adequate funding for Integrated Rapid Public Transport Networks					
Capacity expansion funded by private sector (R'million)	All capacity expansion funded by Transnet	Private sector investment in iron ore (90 mt) and coal (91 mt) long term expansions	Transnet Annual reports; PFMA approvals; Transnet reporting on capex	Assumption is that projects are attractive for private sector; availability of private funding	DPE (Transnet)
Number of Public-Private Partnerships (PPPs) in rail infrastructure and wagon fleet	No PPPs in rail infrastructure	10% of network as PPPs by 2014	Transnet Business Plan; PFMA approvals; Shareholder Compact	Assumption is that projects are attractive for private sector; availability of private funding	DPE (Transnet)
Number of additional kilometres that IRPTN/BRT networks are extended	Infrastructure in JHB. CT,NMB	Full roll-out of phase1 networks in JHB, NMB, Tshwane and CT by Dec 2011	Metros, DoT, Provinces, Public Transport Strategy	Implementation of Public Transport Strategy	DoT, Provinces, Metros
Number of additional kilometres of improved and maintained road networks	606 000 km (10% very good, 60% good, 30% poor to very poor)	15% very good, 65% good, 20% poor to very poor	DoT, Provinces, Municipalities, RIFSA	Implementation of RIFSA	DoT, Provinces, Metros
Sub-output 3.3: Introduction of private operators at branch line level					
Number of private sector branch line concessions	No concessions on secondary network	At least 3 private operators on branch lines by Dec 2011	Transnet Annual report; Concession agreements signed; CIPRO registration	Interim access regulation for branch lines to be developed by DoT (in the absence of a rail economic regulator)	DPE, Transnet, DoT
Progress milestones in the establishment of the Rail Economic Regulator as per 1.4	No Rail Economic Regulator	Rail Economic Regulator established by Dec 2012	Departmental reporting	New institutional arrangement for rail	DoT, DPE, NT
Progress milestones in promulgation of the Rail Act as per item 1.3 and 1.4	No Act	Rail Act promulgated by March 2012	Implementation of Act	New institutional arrangement for rail	DoT, DPE, NT
Interim legislation for branch line regulation	No legislation	Branch line regulatory legislation completed by Dec 2011	Transnet Business Plan; Concession agreements signed, Framework between government and Transnet	Interim access regulation for branch lines to be developed by DoT (in the absence of a rail economic regulator)	DPE, DoT, NT
Sub-output 3.4: Implement the National Ports Act and create transparent subsidies between ports and rail infrastructure					
Approved guidelines to allow transparent cross subsidisation of rail by ports	None	Adoption and approval of guidelines by Dec 2011	Cross subsidisation framework	Implementation of Framework	DoT, DPE, NT
Sub-output 3.5: Introduce competition for the management of container terminals					
Milestone indicators in the establishment of a Joint venture in Ngqura transshipment container terminal: 1. TOR approved by minister 2. Request for proposals published 3. Announcement of adjudication results 4. Joint venture agreement signed	No licensed private container operator	Licensed operator in place by Dec 2012	NPA competitive process; Container operator license issued by the Ports Regulator	Introduction of a global operator that can attract transshipment volumes	DPE, DoT, NT

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Sub-output 3.6: Complete a long term national freight network plan (rail and ports)					
Milestone indicators in long term freight network plan: 1. Interdepartmental task team established 2. Draft report approved by ministers 3. Transnet Infrastructure Build programme approved by cabinet	Transnet Infrastructure Plan (TIP) consulted	TIP approved by Cabinet – March 2011 (DPE)	Cabinet approval for DIA site; Findings from report on standard gauge assimilated in the rail policy		DPE, DoT, Provinces
Sub-output 3.7: Improve productivity at ports					
Productivity Improvements at container terminals measured in crane moves per hour	22 crane moves/hr in 2008	35 gross crane moves per hour in Durban by 2014	Transnet annual report; CSIR state of logistics reports; Independent reports	Buy-in of labour to improve port productivity	DPE, DoT
Sub-output 3.8: Monitor the Implementation of the Transnet Infrastructure Build Programme					
Performance of approved projects against schedule and budget by Transnet .		Committed Transnet projects implemented by 2017	Annual reports, DPE Dashboard, Entity reports		DPE, DoT and NT
Output 4: Maintenance and supply availability of our bulk water infrastructure					
Sub-output 4.1: New augmentation schemes implemented					
Performance of approved projects against schedule and budget by DWA.	2 projects under construction; 5 projects in project preparation stage	5 major projects to be complete by 2014 and two to be completed by 2015	DWA departmental reporting	Assume: • Funding allocations by NT will be made to meet completion date • Adequately skilled professional staff will be available for required project management, design and supervisory functions • Environmental authority obtained as programmed • Users cooperate to conclude Water Supply Agreements as programmed	DWA, NT, DEA, DAFF, Do Energy, TCTA
Sub-output 4.2: New Regional Bulk Water Infrastructure systems developed					
Number of Regional Bulk Water Projects completed	11 water supply systems (completed)	60 projects to be completed by 2014, including water and waste water treatment works and water supply systems.	• Implementation Agreements • Approval of Implementation Ready Reports • Progress reports on non-financial deliverables • Expenditure reports and proofs of payments • Filing library • Internal pre-audits • Quarterly project performance monitoring and evaluation reports • Annual performance evaluation report of programme • Site hand-over reports • DWA Business Plan quarterly reports	Assumptions: • Growth in demand for services • Water Use Licences are timely approved • Environmental Impact Assessments are timely approved • Projects are implementation ready • Allocation of co-funding. Risks: Time delays of implementation by WSA • Escalation costs higher than budgeted • WSAs' lack of capacity to implement • O & M plans not adhere to • High level of water losses • WSA lack of capacity to manage schemes	DWA

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Sub-output 4.3: Existing water resources infrastructure maintained					
Number of additional maintenance projects completed, to reduce current backlog on rehabilitation of national dams and water conveyance projects	Rehabilitation of 14 dams and 1 conveyance project rehabilitated	Rehabilitation of 25 national dams and 28 water conveyance projects by 2014	DWA departmental reporting	Assumptions: • Water Pricing Strategy is amended to increase revenue • Adequately skilled professional staff will be available for required project management, design and supervisory functions • Environmental authority obtained as programmed • Approval to take infrastructure out of commission for long enough periods to do rehabilitation (water users do not have adequate storage to allow sufficient dry periods for extensive rehabilitation works)	DWA
Sub-output 4.4: Regulation of the water sector improved (Establishment of Water Economic Regulator)					
Milestones indicators in the establishment of Independent Water Economic Regulator: 1. Draft study and stakeholder consultation (2010/2011) 2. Study approved by the minister (2010/2011) 3. Legislation/Amendments to existing legislation approved by minister 4. Cabinet approval 5. Public consultation/ introduction of legislation to parliament 6. Parliamentary approval 7. Promulgation 8. Appointment of board and CEO	No independent water economic regulator currently	Independent water economic regulator established by 2014	DWA departmental reporting	Assumptions: • Buy-in will be received from stakeholders • Ability to reconcile competing interests	DWA, NT, DPE, EDD, DTI, DAFF, CoGTA, water boards,
Sub-output 4.5: Backlog in the issuing of water licenses removed					
Number of additional outstanding licenses (as per backlog definition) finalised	Initially estimated at 3642 and to date 945 have been finalised, with additional on-going applications	100% Completion by March 2011	Project manager to oversee activities and provide progress reports	Assumptions: A dedicated team assigned and cooperation from stakeholder	DWA

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Sub-output 4.6: Raw water pricing strategy, funding model and institutional structures for infrastructure delivery reviewed					
Milestone indicators in the revision of the raw water pricing strategy, funding model and delivery structures: 1. Drafts approved by minister 2. Drafts released for public consultation 3. Drafts submitted to cabinet 4. Cabinet approval 5. Strategies gazetted		Water pricing strategy and funding model revised by 2014	DWA departmental reporting	Assumptions: • Buy-in will be received on not to subsidise water tariffs to the irrigation sector Risks: Food prices could increase	DWA
Output 5: Information and communication technology					
5.1. Increase broadband penetration					
Broadband penetration rate (Number of households with access to broadband)	2%	10% by 2014	BMI-T reports and DoC databases		DoC, Sentech, USAASA, SAPO (Thusong Centres)
Sub-output 5.1.1: Establishment and operation of broadband inter-governmental implementation committee					
Milestones in the establishment of a committee: 1. Draft terms of reference(DoC; August 2010) 2. Inaugural meeting; Nov 2010 3. Development of Implementation Plan by Mar 2011 4. Number of meetings; Ongoing			DoC reporting on completion of milestones Number of meetings		DoC and relevant provincial and municipal stakeholders
Sub-output 5.1.2: Development of national broadband legislation					
Milestone indicators in the development of broadband legislation: 1. Minister approves submission to cabinet 2. Cabinet approves bill for public consultation by Mar 2012 3. Introduced in parliament 'Mar 2013 4. Parliamentary approval 5. Promulgation by Mar 2014	National Broadband legislation approved and promulgated	N/A	DoC reporting on completion of milestones	Draft Bill approved by Cabinet/Non-approval of Bill by Cabinet	DoC
Sub-output 5.1.3: E-Connectivity projects implemented					
Number of schools connected as per DBE user requirement specifications	15%(4200 schools)	Addition 5500 schools connected by March 2012	number of schools connected.	Non-availability of funding for the plan	DoC, DBE
Sub-output 5.1.4: Reduction of wholesale broadband prices					
Reduction in cost per megabyte of bandwidth		30% reduction by 2014	% price reduction from the benchmark wholesale regulated pricing levels. – Data Source: ICASA		DoC, ICASA

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Sub-output 5.1.5: Development of wholesale infrastructure					
Number of Broadband POP's providing connectivity and access in major cities	11 POP's from various service providers.	18 POPs by 2011 March	Annual reports of various service providers, ICASA and BMI-T	This assumption is based on Infraco finding other Electronic Communications Network Services license (ECNS) licensed operators within the under-serviced areas.	ECNS licensed operators
Number of Broadband POP's providing connectivity and Access in under-serviced areas	No Broadband connectivity POPs in underserviced areas	3 POPs in under-serviced areas by March 2011	Number of POPs in the under-serviced areas in accordance with the terms and conditions of the Infraco's Electronic Communications Network Services license. – Source: ICASA Regulatory reports	This assumption is based on Infraco finding other Electronic Communications Network Services license (ECNS) licensed operators within the under-serviced areas.	DPE, Infraco and ECNS licensed operators in under-serviced areas
Sub-output 5.2: 2010 Legacy projects implemented					
Sub-output 5.2.1: Implementation of the Legacy Plan on future utilisation of ICT infrastructure rolled out for the 2010 FIFA World Cup facilitated					
Milestones: 1. Consultation with municipalities on redeployment of redundant world cup ICT infrastructure 2. Implementation plan developed 3. Telkom buy-back of redundant equipment 4. Implementation project Indicators: a) Number of projects involving equipment redeployment to two host cities (Cape Town and Tshwane) b) Number of Telkom projects to connect 125 Dinaledi schools	Existing WC 2010 redundant ICT equipment at host cities as per FIFA guarantees	2 projects involving the transfer of equipment to host cities and Telkom projects involving 125 Dinaledi schools by Mar 2011	Monthly monitoring meeting with host cities and Telkom. Delivery status reports.	For Dinaledi schools: Confirmation of user requirement specification by DBE	DoC, DBE Telkom and Host Cities
Sub-output 5.3: DTT rollout					
% Population/household coverage of Digital Television Transmission (DTT) infrastructure	33% DTT rollout	96% DTT rollout by March 2013	Digital Dzonga Advisory body and DoC. Monthly monitoring meeting with broadcasters and stakeholders. Delivery status reports.	Resources Required available, Confirmation of Technology Standard, Set Top box standard, Subsidy and distribution mechanism	DoC, Sentech, Digital Dzonga, Broadcasting Industry Stakeholders
Sub-output 5.4: Local loop unbundling					
Report on Unbundling of local loop	No report	Proposals and recommendations on unbundling	DoC submission of report		DoC
Output 6: A set of operational indicators for each segment					
Sub-output 6.1: Develop a set of operational benchmarks for each section					
Crane Moves per hour (in Durban Container Terminal – DCT)	22 container moves/hr in 09/10	35 container moves/hr by 2014	DPE Shareholder compact; NCPM project; industry journals; CSIR	Labour buy-in on targets, improvements in yard/ operations management	DPE, DoT, DTI
Ship Turnaround Time (STAT)	48 hours in 09/10	38 hours by 2014	DPE Shareholder compact; NCPM project; industry journals; CSIR	Labour buy-in on targets, improvements in yard/ operations management	DPE, DoT, DTI

Indicator	Baseline	Target	Monitoring mechanisms (Means of verification, sources of information)	Assumptions/Risks	Responsibility
Rail corridor traffic volume growth (%)	Corridor traffic on road 213 mt (13%) and rail 45 mt (3%) in 2008	Increase in rail corridor traffic to 6% by 2012 and 10% by 2014	DPE Shareholder compact; NCPM project; industry journals; CSIR	Labour buy-in on targets, requisite investments made to upgrade rail infrastructure and rolling stock	DPE, DoT, DTI
Improvements in freight wagon turnaround time	GFB: 14.3 days, coalink: 70 hrs, Orex: 85 hrs	By FY end 2011/12; GFB; 11.4 days, Coalink; 58 hrs, Orex; 72 hrs	DPE Shareholder compact; NCPM project; industry journals; CSIR	Labour buy-in on targets, requisite investments made to upgrade rail infrastructure and rolling stock	DPE, DoT, DTI

Definitions

1. Broadband Penetration: Refers to the percentage or absolute number of broadband subscribers or potential subscribers within a geographic area
2. Rolling Stock: The equipment available for use as transportation, as automotive vehicles, locomotives, or railroad cars. i.e. All vehicles that move on a railway
3. Power Purchase Agreement (PPA): Is a legal contract between an electricity generator (provider) and a power purchaser (host). The power purchaser purchases energy, and sometimes also capacity and/or ancillary services, from the electricity generator. Such agreements play a key role in the financing of independently owned (i.e. not owned by a utility) electricity generating assets
4. Digital Terrestrial Television: It refers to the broadcasting of terrestrial television in a digital format. The digital signals can be received using a standard aerial for TV. Currently, terrestrial broadcasting in South Africa is broadcast in an analogue format
5. Rehabilitation: To restore to good condition, operation, or capacity
6. Backlog: An accumulation of jobs not done that are yet to be dealt with
7. Port: A place on a waterway with facilities for loading and unloading ships
8. Export: The commercial activity of selling and shipping goods to a foreign country (Mining Exports - mining products sold to foreign countries)
9. Fleet (Vehicles): Is a collection of ships or vehicles, with many specific connotations
10. Vertically Integrated System: One company controls the entire industrial process from source of raw material to the final market.

Acronyms

PSP's: Private Sector Partnership
IPP's: Independent Power Producers
PPA: Power Purchase Agreement
IMC: Inter Ministerial Committee
PFMA: Public Finance Management Act
TFR: Transnet Freight Rail - formely Spoornet
mtpa: Million Tons per Annum
TPT: Transnet Port Terminal - formely known as South African Port Operator
DCT: Durban Container Terminal
MPT: Multi Purpose Terminal
Transnet Pipelines: Formely Petronet
INEP: Integrated National Electrification Programme
CSDP: Competitive Supplier Development Programme
BRT: Bus Rapid Transit
IRPTN: Integrated Rapid Public Transport Network
Natmap: National Transport Master Plan
PMBOK: The Project Management Body of Knowledge
ISMO: Independent System and Market Operator
POP's: Points of Presence

Appendix B: Implementation Plan

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Outcome 6: An efficient, competitive and responsive economic infrastructure network								
Output 1: Improved regulation and competition								
Sub-output 1.1: Review of transport industry structure to consistently drive the principle of separating policy from regulation from operations								
1.1.1 Develop a report on transport industry structure	1. TOR approved by Minister 2. Review committee appointed.	1. Draft report completed 2. Submitted to cabinet 3. Cabinet decision	1. DoT led inter-governmental team established to explore options as set out in the Report. 2. Guidelines, instruments and oversight mechanisms developed to effect and monitor industry compliance and conformity.	1. Appropriate institutional framework/ arrangements put in place to implement and monitor compliance.	Apr-14	Internal resources DoT, DPE & National Treasury	Internal resources DoT, DPE & National Treasury	DoT – Overall process lead DPE – Source data from Transnet, economic and funding implications NT – Funding and economic implications
Sub-output 1.2: Measures to implement the Ports Act and introduction of competition with ports								
1.2.1 Develop a position paper on the implementation of the Ports Act and implement cabinet decisions through ministerial directive	1. Paper on implementation of Ports Act approved by Minister 2. Inter-Governmental Team established	1. Cabined decision Framework for ports published	1. Incorporation of decision into Transnet shareholder compact and Transnet Business Plan or ministerial directive		Mar-13	Internal resources DoT, DPE & National Treasury	Internal resources DoT, DPE & National Treasury	DoT – Overall process lead DPE – Source data from Transnet, economic and funding implications NT – Funding and economic implications
1.2.2 Implementation of the Freight Logistics Strategy		1. TOR approved by minister 2. Review committee appointed 3. Draft report completed	1. Submitted to cabinet 2. Cabinet decision		Ongoing	Inter-governmental Committee led by DoT	Inter-governmental Committee led by DoT	Inter-governmental Committee led by DoT
1.2.3 DPE and DoT Ministers and Ports Regulator to facilitate competition in ports arising from cabinet decisions		1. Ministerial and Ports Regulator directives issued to facilitate competition in ports from cabinet decision	1. Implementation of appropriate economic framework		Mar-13	Internal resources DoT, DPE & National Treasury and the Regulator	Internal resources DoT, DPE & National Treasury and the Regulator	National Treasury, DoT, DPE

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 1.3: Completion of the rail policy								
1.3.1 Development of the rail policy	1. Draft rail policy framework on rail economic regulation (Network access, infrastructure pricing and tariffs) approved by the minister	1. Cabinet Approval 2. Release for public comment 3. Parliamentary approval	1. Implementation of the rail policy	1. Implementation of the rail policy	Dec-11	Internal resources DoT, DPE & National Treasury	Internal resources DoT, DPE & National Treasury	DoT - Overall process lead DoT and DPE – Source data from Prasa and Transnet, economic and funding implications. NT – Funding and economic implications
Sub-output 1.4 The completion of the Rail Act which established the framework for economic and safety regulation as well as competitors within the rail sector								
1.4.1 Develop and operationalise Rail legislation	1. Draft Rail Bill	1. Draft Bill approved by cabinet 2. Bill released for Public Comment 3. Bill approved by Parliament	1. Rail Act Approved and start of implementation. 2. Required regulations developed and finalised	1. Institutions and/or instruments for managing implementation established	Mar-14	DoT, DPE and National Treasury internal HR	DoT Departmental baseline	DoT – Overall process lead
1.4.2 Establish rail economic regulator	1. Establish interim capacity: functions and interim management and regulatory arrangements.	1. Analysis of Prasa and Transnet Freight Rail (TFR) within a due diligence report, to identify and clarify regulatory functions 2. Regulatory function consolidated into a single interim rail economic regulator for both passenger and freight	1. Permanent rail regulator established, including: - Appointment of board - Appointment of CEO and staff of RER 2. Development of regulatory frameworks, methodologies, oversight mechanisms and other regulatory instruments informed by the Policy and Act		Mar-13	DoT, DPE and National Treasury, Prasa and Transnet internal HR	DoT Departmental baseline	DoT
1.4.3 Interim provisions enabling branch lines concessioning finalised	1. Branch line strategy and enabling provisions approved by Minister	1. Cabinet Approval of the branch line strategy and enabling provisions	1. (Permanent provisions for the branch lines approved as part of the rail act)		Jun-11	DPE and DoT internal HR	Transnet/ Concessionaire	DPE , DoT and National Treasury

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 1.5: Presidential report on encouraging competition, improvement of regulation, and investigation of single regulatory coordination under the competition commission								
1.5.1 Development of the report on encouraging competition, improvement of regulation, and investigation of single regulatory coordination under the competition commission	1. Report submitted				Dec-10	DoT, DPE, DoE, DWA and DoC	DoT, DPE, DoE, DWA and DoC	DoT, DPE, DoE, DWA and DoC
Output 2: Reliable generation, distribution and transmission of energy								
Sub-output 2.1: Create regulatory and institutional structures for the introduction of viable Independent Power Producers (IPP) and start process for the participation of IPPs in 2010								
2.1.1 Consultation on form and functions of the new ISMO entity	1. Documented evidence of consultation with (in the minimum), DPE, NT and Eskom				Dec-10	Inter-governmental workgroup	Internal DOE Budget	DoE: Lead department – Policy Developer DPE: Eskom Shareholding Dept National Treasury: Financial Consideration to Government
2.1.2 Develop Cabinet Memorandum for Approval on the Establishment of ISMO	1. Cabinet approval of the phased implementation				Mar-11	Inter-governmental workgroup	Budgets of relevant departments	DoE: Lead department – Policy Developer DPE: Eskom Shareholding Dept National Treasury: Financial Consideration to Government
2.1.3 Establishment of a ring-fenced ISMO within Eskom. Ring-fenced ISMO to have its own Divisional Board	1. Instruction to ring-fence through Eskom shareholder compact by Minister of Public Enterprises	1. Regulation on licensing to be introduced requiring Eskom to ring-fence regulatory accounts 2. Ring-fenced ISMO established within Eskom			Sep-11	Inter-governmental workgroup	Budgets of relevant departments	DoE: Lead department – Policy Developer DPE: Eskom Shareholding Dept National Treasury: Financial Consideration to Government

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
2.1.4 Develop legislation to establish a completely separate ISMO outside of Eskom		1. ISMO bill enacted creating the framework for the establishment of ISMO as a separate legal entity			Nov-11	Inter-governmental workgroup	Budgets of relevant departments	DoE: Lead department – Policy Developer DPE: Eskom Shareholding Dept National Treasury: Financial Consideration to Government
2.1.5 Operationalising Legislated ISMO		1. Financial, legal and technical due diligence conducted	1. Systems (including contracts, financial systems, IT systems, HR) and change management process put in place to make ring-fenced ISMO functionally independent of Eskom	1. PFMA approval for listing as a separate entity	Nov-14	Inter-governmental workgroup	Budgets of relevant departments	DoE: Lead department – Policy Developer DPE: Eskom Shareholding Dept National Treasury: Financial Consideration to Government
2.1.6 Develop comprehensive IPP regulations.	1. Revised IPP regulations promulgated.				Mar-11	Inter-governmental workgroup	Budgets of relevant departments	DoE: Lead department – Policy Developer DPE: Eskom Shareholding Dept National Treasury: Financial Consideration to Government
Sub-output 2.2: Develop a funding and implementation plan and reduce the distribution infrastructure maintenance backlogs of R27.4bn to R15bn by 2014								
2.2.1 Develop a Cabinet Memorandum on funding plan and high level implementation plan	1. Cabinet Memo on distribution infrastructure funding plan				Mar-11	Inter-governmental workgroup	DoE budget	DoE, DPE and NT
2.2.2 Develop a detailed implementation plan to address investment backlog		1. Detailed ADAM implementation plan			Mar-12	Inter-governmental workgroup	DoE and Budgets of stakeholder departments	DoE, DPE and NT

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
2.2.3 Develop a detailed report for all municipalities on status of distribution infrastructure	1. Report detailing a map of distribution assets status per metro	1. Report detailing a map of distribution assets status per secondary city	1. Report detailing a map of distribution assets status for 50% of all municipalities	1. Report detailing a map of distribution assets status for 100% of all municipalities	Dec-14	Inter-governmental workgroup, metros and other municipalities	Budgets of relevant departments, Metros and other Municipalities	DoE and municipalities
2.2.4 Implement projects on distribution network rehabilitation.	1. Reduction of investment backlog by R2bn	1. Initiate interventions, and monitor distribution rehabilitation project implementation at metros and other municipalities 2. Reduction of investment backlog by R5bn	1. Initiate interventions, and monitor distribution rehabilitation project implementation at metros and other municipalities 2. Reduction of investment backlog by R8bn	1. Initiate interventions, and monitor distribution rehabilitation project implementation at metros and other municipalities 2. Reduction of investment backlog by R12.4bn	Dec-14	Inter-governmental workgroup, metro's and other municipalities	Budgets of metros and other municipalities and possibly national infrastructure grants	DoE and municipalities
Sub-output 2.3: Household access to electricity should be 92% by 2014								
2.3.1 Continuation of the current INEP Programme	1. 180 000 households electrified 2. 500 schools electrified 3. 10 000 solar home systems installed	1. 180 000 households electrified 2. 500 schools electrified 3. 10 000 solar home systems installed	1. 180 000 households electrified 2. 500 schools electrified 3) 10 000 solar home systems installed	1. 180 000 households electrified 2. 500 schools electrified 3) 10 000 solar home systems installed	Mar-14	DoE, municipalities and Eskom	Current INEP allocation	DoE, municipalities and Eskom
2.3.2 Expansion of integrated national electrification programme by municipalities and other departments through non-fiscal funding and other fiscal grants	1. Finalised Electrification Strategy for informal settlements concluded in consultation with relevant departments and stakeholders	1. Study on identification of critical bulk infrastructure with the relevant departments completed 2. 200 000 households electrified	1) 200 000 households electrified	2) 200 000 households electrified	Mar-14	Municipalities, Rural Development, Education, Health, Human Settlements, and Eskom	Budgets of relevant departments	Municipalities, Rural Development, Education, Health, Human Settlements, and Eskom
Sub-output 2.4: Develop a funding model for Electricity Generation/build programme to ensure security of supply								
2.4.1 Development of the Funding Model for the committed Eskom build programme	1. Funding Model developed and submitted to Cabinet				Dec-10	DoE, DPE and NT	DoE, DPE and NT	DoE, DPE and NT
Sub-output 2.5: Long-term Energy Mix Diversification to address the Security of Energy supply and Requirements for Renewable Energy								
2.5.1 Promulgate the IRP after considering public comments	1. IRP gazetted				Mar-11	Inter-governmental workgroup	Budgets of relevant departments	DoE leads all the processes DoE, DPE and other relevant departments

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
2.5.2 Implement the IRP		1. Projects identified in IRP licensed and executed in accordance with the required timelines	1. Projects identified in IRP licensed and executed in accordance with the required timelines	1. Projects identified in IRP licensed and executed in accordance with the required timelines	Ongoing	IPP Unit	Transaction Costs per project to be funded from combination of tariff and debt	DoE leads all the processes DoE, DPE and other relevant departments
2.5.3 Install additional megawatts of generation capacity through conventional power, renewable energy and cogeneration		1. 500 MW Installed	1. 1000 MW installed	1. 2000 MW installed	Ongoing	IPP Unit and Private Players	Transaction Costs per project to be funded from combination of tariff and debt	DoE, DPE and other relevant departments
2.5.4 Medium term risk mitigation plan (MTRMP) adopted as strategy to balance supply-demand in the period up to 2015, after consideration of public comments	1. MTRMP gazetted	1. Projects identified in MTRMP licensed and executed in accordance with the required timelines			Mar-14	Social Partners including Labour, business, civil; society to make contribution in the different sectors	Tariff	DoE, DPE and other relevant departments
2.5.5 Reduce the demand for electricity through the DSM, including: - Solar water heating - Industrial/ commercial energy efficiency - Energy conservation scheme - Residential energy efficiency	1. 9 terawatts hours of savings achieved	1. 6 terawatts hours of savings achieved	1. 9 terawatts hours of savings achieved		Mar-14	Social Partners including Labour, business, civil; society to make contribution in the different sectors	Tariff	DoE, DPE, Eskom and Municipalities

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 2.6: Coal Haulage Logistics								
2.6.1 Migrate Eskom coal from road to rail	1. Railway lines, rolling stock and service design plans completed 2. MOU between Eskom and Transnet signed 3. (a) Number tonnes of coal transported on rail – 8.8 mtpa (b) Number of tonnes of coal transported on road – 36.1 mtpa	1. Number tonnes of coal transported on rail – 12.6 mtpa 2. Number of tonnes of coal transported on road – 28.3 mtpa 3. Implementation of Eskom-Transnet MOU	1. Number tonnes of coal transported on rail – 19 mtpa 2. Number of tonnes of coal transported on road – 23.5 mtpa 3. Implementation of Eskom-Transnet MOU	1. Number tonnes of coal transported on rail – 29 mtpa 2. Number of tonnes of coal transported on road – 11.8 mtpa 3. Implementation of Eskom-Transnet MOU	Mar-14	Eskom and Transnet	Eskom and Transnet	DPE, DoT and DoE
2.6.2 Rehabilitate of coal haulage roads	1) MOU between Eskom, Mpumalanga DPWRT and Gauteng DRT 2..Service Level Agreement (SLA) between SANRAL, the Mpumalanga (DPWRT), Gauteng DRT. 3..128.4 km coal haulage roads rehabilitated	1. Additional 439 km of coal haulage roads rehabilitated	1. Additional 380 km of coal haulage roads rehabilitated	1. Additional 370 km of coal haulage roads rehabilitated	Ongoing	DoT, DPE, , DoE, Eskom, NT and Mpumalanga and Gauteng roads departments	Tariff and possibly fiscal funding	DoT, DPE, , DoE, Eskom, SANRAL, Mpumalanga and Gauteng roads departments
Sub-output 2.7: Restructuring of the Electricity Distribution Industry (EDI)								
2.7.1 Determine the way forward for the EDI in the context of the challenges regarding RED creation	1. Cabinet Memo submitted to seek approval regarding the revised approach, which focuses on regulatory rather than structural interventions 2. Cabinet decision on REDS				Sep-11	Inter-governmental workgroup	Budgets of relevant departments	DoE, CoGTA, DPE and National Treasury

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 2.8: Setting cost reflective tariffs while cushioning the poor from increasing electricity costs								
2.8.1. Introduction of Electricity Basic Service Support Tariff (EBSST) in municipalities where EBSST is not existent	1. Identify the municipalities where EBSST is not being implemented 2. Identify underlying challenges that inhibit FBE rollout	1. Develop targeting framework for qualifying beneficiaries in collaboration with municipality.	1. Increase coverage of qualifying beneficiaries to 100%	1. Maintain coverage of qualifying beneficiaries at 100%	Mar-14	Inter-governmental workgroup	Budgets of relevant departments	DoE, NT, CoGTA, SALGA
2.8.2. Introduction of Free Basic Alternative Energy in unelectrified areas	1. Identify the municipalities where EBSST is not being implemented 2. Identify underlying challenges that inhibit FBAE rollout	1. Develop targeting framework for qualifying beneficiaries in collaboration with municipality.	1. Increase coverage of qualifying beneficiaries to 100%	1. Maintain coverage of qualifying beneficiaries at 100%	Mar-14	Inter-governmental workgroup	Budgets of relevant departments	DoE, NT, CoGTA, SALGA
2.8.3. Introduce inclining block tariffs (IBT) for qualifying households that use prepaid meters	1. Determine the business case for facilitating the introduction of IBT for prepaid meters	1. Develop a funding plan to adjust qualifying prepaid meters for IBT, if feasible; start rolling out IBT for prepaid meters			Mar-14	Inter-governmental workgroup	Budgets of relevant departments	DoE, NT, CoGTA, SALGA
2.8.4. Implement the other FRIDGE Study recommendations (beyond IBT) in collaboration with Nedlac constituencies	1. Identify and agree the elements to implement through consultation with Nedlac constituencies				Mar-14	Inter-governmental workgroup	Budgets of relevant departments	DoE, NT, CoGTA, SALGA

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 2.9: Monitor the Implementation of the Eskom Infrastructure Build Programme and other Infrastructure investments in electricity generation								
2.9.1 Projects - Completion of Grootvlei RTS (1200 MW) - Increase Arnot capacity (300 MW) - Completion of Komati RTS (1000 MW) - Completion of Sere Wind farm (100 MW) - Completion of Upington Solar (100 MW) - Completion of Medupi Unit 1 - Completion of OCGT IPP (1000 MW) - Completion of Kusile Unit 1 - Completion of Ingula Unit 1	1. Completion of Grootvlei RTS (1200 MW) and Arnot capacity increases (300 MW)	1. Completion of Komati RTS (1000 MW), Sere Wind farm (100 MW) and Upington Solar (100 MW)	1. Completion of Medupi Unit 1 and OCGT IPP (1000 MW)	1. Completion of Kusile Unit 1 and Ingula Unit 1 (both completed by 2015)	Ongoing	Eskom and IPP's	Off-budget financing	DPE, Eskom , IPP's
Output 3: To ensure the maintenance and strategic expansion of our road and rail network, and the operational efficiency, capacity and competitiveness of our sea ports and rail								
Sub-output 3.1: Increase the Market Share of Total Freight to rail to an annualised 250 mt from the current 177 mt by 2014								
3.1.1 Develop and implement a rail freight improvement programme to increase rail market share	1. Government Task Team established 2. TOR outlining scope of work to be covered by the task team completed	1. Diagnostic workshop with Transnet Freight Rail 2. Report on key initiatives to address modal shift completed 3. Identification of relevant legislation to be amended and approval by cabinet (Amend Road Traffic Act, Legal succession act, etc.) 4. Targets set and included in Transnet's shareholder compact and business plan 5. Promote additional tonnages on branchlines and GFB	1. Policies and bill amended (Instruments, guidelines and standards for effective management of shift) 2. Institutional capacity/re-organisation done to manage implementation 3. 10% increase in rail market share	1. 15% increase in rail market share (250 mt moved by rail)	Mar-14	Internal resources in DPE, DoT and Transnet	DoT and DPE baseline budget	DoT – modal shift document, regulatory and policy amendments DPE – Facilitate Transnet rail capacity/ efficiency/ operational improvements DPE leads overall process

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
3.1.2 Facilitate additional tonnage on bulk lines, promote additional tonnage on branch lines, and increase market share percentage of freight tonnage moved by rail relative to road (GFB)	1. 9% increase in previous year tonnage (aggregate increase in tonnage on all lines)	1) 9% increase in previous year tonnage (aggregate increase in tonnage on all lines)	1) 9% increase in previous year tonnage (aggregate increase in tonnage on all lines)	1) 9% increase in previous year tonnage (aggregate increase in tonnage on all lines)	Mar-14	Internal resources in DPE, DoT and Transnet	DoT and DPE baseline budget	DoT – modal shift document, regulatory and policy amendments DPE – Facilitate Transnet rail capacity/ efficiency/ operational improvements DPE leads overall process
3.1.3 Increase and improve the rolling stock fleet (304 locomotives: 110 for coal, 150 for GFB, 44 for the iron ore over a five year period)	1. Rolling stock and fleet procurement plan for Transnet (including Prasa) as part of the CSDP developed, and consultations and analysis completed	1. Cabinet approval of CSDP 2. Supplier contract/s signed	1. Delivery of locomotives as per contract and local content targets as per DTI	1. Delivery of locomotives as per contract and local content targets as per DTI 2. Impact assessment report of CSDP on local supplier development, emerging enterprises and local job creation	Ongoing	Internal resources in DPE, DoT and Transnet	DPE	DPE
Sub-output 3.2: Introduction of Private Sector Investment in Rail and secure adequate funding for Integrated Rapid Public Transport Networks								
3.2 1 Establish process to facilitate private sector investment in rail including iron ore and coal expansions	1. Identification of investment areas where Private investment in rail is appropriate 2. Transnet private sector participation (PSP) framework developed for approval	1. market testing of private sector appetite to invest 2. PSP framework approved by cabinet 3. PPP process initiated	1. Institutional capacity established to manage PPP delivery process 2. Framework/ agreements negotiated and entered into with private sector 3. Roll out of cabinet approved PSP framework	1. 10 PPP's on rail realised	Mar-14	Internal resources in DPE, DoT and Transnet	Internal resources in DPE, DoT and Transnet	DoT - modal shift document, regulatory and policy amendments DPE- Facilitate Transnet rail capacity/ efficiency/ operational improvements DPE leads overall process
3.2.2 Introduce PPP's in rail infrastructure		1. 4% of networks as PPP's	1. 3% of networks as PPP's	1. 3% of networks as PPP's	Mar-14	DPE, Transnet and Treasury	Transnet	DPE

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
3.2.3 Roll out of IRPTN/BRT networks		1. Phase 1 networks in JHB, NMB, Tshwane and CT roll out completed 2. Roll out of Phase 2 networks in JHB, NMB, Tshwane and CT 3. Development of plans, funding and monitoring of IRPTNs for other cities and district municipalities	1. Roll out of Phase 2 networks in JHB, NMB, Tshwane and CT 2. Development of plans, funding and monitoring of IRPTNs for other cities and district municipalities	1. Roll out of networks in JHB, NMB, Tshwane and CT 2. Development of plans, funding and monitoring of IRPTNs for other cities and district municipalities	Mar-14	DoT internal HR	DoT Departmental baseline	DoT
3.2.4 Improvement of strategic roads and implementation of RISFSA	1. Establishment of inter-governmental task team 2. Funding and capacity requirements assessed	1. Definition of strategic secondary roads completed and approved by MINMEC and cabinet 2. Improvement plan with funding and capacitation strategy developed and approved in partnership with affected road authorities	1. Implementation of RISFSA	1. Implementation of RISFSA	Mar-14	DoT internal HR	DoT baseline budget	DoT

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
3.2.5 Improve road quality(all roads); Very good roads from 10% to 15% Good roads from 60% to 65%; Poor to very poor roads from 30% to 20%	1. Very good roads: 1.3% increase 2. Good roads: 1.3% increase 3. Poor to very poor roads: 2.5% reduction	1. Very good roads: 1.3% increase 2. Good roads: 1.3% increase 3. Poor to very poor roads: 2.5% reduction	1. Very good roads: 1.3% increase 2. Good roads: 1.3% increase 3. Poor to very poor roads: 2.5% reduction	1. Very good roads: 1.3% increase 2. Good roads: 1.3% increase 3. Poor to very poor roads: 2.5% reduction	Mar-14	DoT, provinces and metros HRs	DoT, provinces, metros, Public Works and NT	DoT, provinces and metros
3.2.6 Approved policy framework for asset (pavement) management system	1. Establishment of intergovernmental task team Draft policy framework produced	1. Consultations on framework 2. Funding and capacity requirements assessed			Mar-12	DoT	DoT	DoT
Sub-output 3.3: Introduction of Private Operators at Branch line Level								
3.3.1 Concessioning of branch lines	1. DoT branchlines Strategy developed 2. Market testing of private sector appetite for branch lines concessions	1. Cabinet approval of DoT branchlines strategy 2. RFP's advertised by Transnet; and 3. Agreements negotiated and signed with selected branchlines operators 4. Three private operators on branchlines by Dec 2011	1.Continued roll out of branchlines concessions	1. Continued roll out of branchlines concessions	Ongoing		DoT, DPE and NT	NT DPE- Leads overall process; DoT responsible for supporting policy context for branchlines
3.3.2 Establish Rail Economic Regulator	As per 1.4.2	As per 1.4.2	As per 1.4.2	As per 1.4.2	As per 1.4.2	As per 1.4.2	As per 1.4.2	As per 1.4.2
3.3.3 Promulgate the Rail Act	As per 1.4.1	As per 1.4.1	As per 1.4.1	As per 1.4.1	As per 1.4.1	As per 1.4.1	As per 1.4.1	As per 1.4.1
3.3.4 Establish interim legislation for branch line regulation	As per 1.4.3	As per 1.4.3	As per 1.4.3	As per 1.4.3	As per 1.4.3	As per 1.4.3	As per 1.4.3	As per 1.4.3

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 3.4: Implement the National Ports Act and create transparent subsidies between ports and rail infrastructure								
3.4.1 Develop a position paper on the implementation of the Ports Act and implement cabinet through ministerial directive	As per 1.2.1	As per 1.2.1	As per 1.2.1	As per 1.2.1	As per 1.2.1	As per 1.2.1	As per 1.2.1	As per 1.2.1
3.4.2 Develop guidelines for transparent port and rail subsidies	1. Government Task Team established, with supporting TOR's	1. Paper on integrated port and rail infrastructure as strategic national assets 2. Investigation of broader funding options for rail 3. Report on feasibility of transparent cross subsidies and implications for Transnet corporate structure 4. Guidelines completed	1. Cabinet approval of recommendations from task team reports; 2. Amendments of relevant legislation; 3. Shareholder directive to Transnet board	1. Implementation of explicit/ transparent cross subsidies between ports and rail	Guidelines by Dec 2011	DPE, DoT and NT internal resources	DPE, DoT and NT	DPE to lead overall process.
Sub-output 3.5: Introduce competition for the management of container terminals								
3.5.1 Licensing of private container operator at Ngqura Port	1. Framework for private sector involvement in the Ngqura container terminal developed	1. Agreed framework approved by Minister of DPE, DoT & concurrence from Ports regulator 2. TOR's for transaction advisor and independent auditors approved 3. Transaction advisor appointed to assist with developing framework for invitation of bids	1. RFP's advertised 2. Evaluation of bids and selection process completed 3. Cabinet approval of preferred bidder 4. Agreement signed with preferred bidder 5. Container operator license issued by ports regulator		Dec-12	Internal DPE, DoT resources, external service provider	DoT and DPE	DPE to lead overall process DoT and NT

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 3.6: Complete a long term national freight network plan (rail and ports)								
3.6.1 Develop a long term national freight network plan including appraisal of the Transnet Infrastructure Plan	1. Interdepartmental task team established, with supporting TOR's 2. Initiate study on long term freight transport demand requirements for the economy 3. Transnet Infrastructure Plan submitted to cabinet for approval	1. Key freight corridor network identified and prioritised for investments and expansion 2. Draft study report completed, including estimation of funding requirements 3. Presentation of preliminary report to the ministers; 4)Final national freight plan report completed	1)Cabinet approval of long term national freight network plan and funding framework 2. Planning aspects incorporated in Transnet capex planning	1) Freight network capacity enhanced	Final report completed by March 2012.	Internal DPE, DoT, EDD and Treasury resources, external service provider on freight demand modelling.	Internal DPE, DoT, EDD and Treasury resources	DoT leads the process, DPE facilitates Transnet inputs, Treasury to provide guidance on funding frameworks and EDD to input on economic growth objectives in line with the new growth path
Sub-output 3.7: Improve productivity at ports								
Integrate and implement a range of production improvement measures	1. 25 crane moves per hour	1. 28 crane moves per hour	1. 31 crane moves per hour	1. 35 crane moves per hour	Mar-14	Transnet	Transnet	DPE and DoT
Sub-output 3.8: Monitor the Implementation of the Transnet Infrastructure Build Programme , and other key transport infrastructure								
3.8.1 Rail Projects - Coast Line Expansion - Iron ore line expansion - General Freight Business(GFB) - Re-instatements of all closed and lifted branch lines - Capitalisation of Infrastructure, wagon maintenance and locomotive change outs on core network - Capitalisation of maintenance on branch lines	1. Capitalisation of Infrastructure, wagon maintenance and locomotive change outs on core network (Ongoing) 2. Capitalisation of maintenance on branch lines (Ongoing)	1. General Freight Business (GFB) completed 2. Capitalisation of Infrastructure, wagon maintenance and locomotive change outs on core network (Ongoing) 3. Capitalisation of maintenance on branch lines (Ongoing)	1. Iron ore line expansion completed 2. Capitalisation of Infrastructure, wagon maintenance and locomotive change outs on core network (Ongoing) 3. Capitalisation of maintenance on branch lines (Ongoing)	1. Coast Line Expansion (completed by 2015) 2. Re-instatements of all closed and lifted branch lines completed 3. Capitalisation of Infrastructure, wagon maintenance and locomotive change outs on core network (Ongoing) 4. Capitalisation of maintenance on branch lines (Ongoing)	Ongoing	Transnet, NT	Transnet, NT	Transnet, DPE, NT and DoT

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
3.8.2 Port Projects - Containers - Construction of port of Ngqura - Ngqura container terminal development - Durban harbour entrance channel widening and deepening - Durban container terminal re-engineering - Durban berth; Deepening of container berth 101 to 103 (Pier 1) Cape Town container terminal - Break bulk - Reconstruction of sheet pile quay walls at Maydon Wharf in Durban - Dry Bulk - Dry Bulk Terminal (DBT) refurbishment and replacement of equipment	1. Construction of port of Ngqura completed 2. Durban harbour entrance channel widening and deepening completed	1. Ngqura container terminal development completed 2. Durban container terminal re-engineering completed 3. Durban berth; Deepening of container berth 101 to 103 (Pier 1) completed 4. Cape Town container terminal completed 5. Reconstruction of sheet pile quay walls at Maydon Wharf in Durban completed			Ongoing	Transnet, NT	Transnet, NT	Transnet, DPE, NT and DoT
3.8.3 Road Projects - Gauteng Freeway Improvement Project (GFIP) - N2 Wild Coast Wine lands - Integrated Rapid Public Transport Networks - Rehabilitation of Coal Haulage Routes	1. Gauteng Freeway Improvement Project (GFIP) Phase 1 completed			1. N2 Wild Coast (completed by 2018) 2. Wine lands (completed by 2015) 3. Integrated Rapid Public Transport Networks (5 cities, JHB, Tshwane, NMM, CPT and others completed)	Ongoing	SANRAL, DoT, NT and Provinces	SANRAL, DoT, NT and Provinces	SANRAL, DoT, NT and Provinces
Output 4: Maintenance and supply availability of our bulk water infrastructure								
Sub-output 4.1 New augmentation schemes implemented								
4.1.1 Vaal River Eastern Sub-System Augmentation Project (VRESAP)	1. Agreements concluded with new suppliers (Sep 2010) 2. Faulty corrosion protection during DNP repaired (Mar 2011) 3. Pipeline servitude rehabilitated (Mar 2011)	1. Abstraction works fully operational (Oct 2011) 2. Coffer dam removed (May 2011) 3. Mechanical and electrical plant commissioned (Jun 2011)	1. Project close out (May 2012)		May-12	Implemented and funded by TCTA. Progress monitored by DWA.	R2,6 billion Off-budget funding via TCTA	DWA, Trans-Caledon Tunnel Authority (TCTA)

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
4.1.2 Komati Water Augmentation Scheme (KWAS)	1. Environmental authorisation obtained (Jun 2010) 2. Water Supply and Implementation Agreements signed (Jan 2011) 3. Contracts awarded (Jan 2011) 4. Land acquired (Mar 2011) 5. Funding secured and site establishment (Mar 2011)	1.Pump station constructed (Mar 2011)	1. Pipeline commissioned (Dec 2012)	1. Project close out (Dec 2013)	Dec-13	Implemented and funded by TCTA. Progress monitored by DWA.	R1,75 billion Off-budget funding via TCTA	DWA TCTA
4.1.3 Mooi-Mgeni Transfer Scheme (MMTS - 2)	1. Environmental authorisation obtained (Oct 2010) 2. Restart EIA for conveyance infrastructure (Feb 2011) 3. Water Supply and Implementation Agreements signed (Feb 2011) 4. Contracts awarded (Feb 2011) 5. Land acquisition commenced (Mar 2011) 6. Funding secured and site establishment (Mar 2011)	1. Excavation completed (Dec 2011) 2. River diverted (Oct 2011) 3. First concrete placed (Jan 2012) 4. Environmental authorisation and tender process for conveyance infrastructure Jan 2012)	1.Land acquisition completed (Jun 2012) 2. Impoundment of water (Dec 2012) 3. Conveyance contract awarded and commence construction (Mar 2013) 4.Delivery of water via MMTS-1 (Mar 2013)	1. Dam site clearance (Mar 2014) 2. Delivery of water via conveyance infrastructure (Mar 2014)	Mar-14	Implemented and funded by TCTA. Progress monitored by DWA.	R1,7 billion Off-budget funding via TCTA	DWA TCTA

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
4.1.4 Oliphant's River Water Resource Development Project (ORWRDP) a) De Hoop dam projects b) De Hoop Bulk distribution system	1. Revision of system yield (Oct 2010) 2. BDS reconfigured and phased (Mar 2011) 3. Water Supply and Implementation Agreements concluded (Mar 2011) 4. Revised funding strategy drafted (Mar 2011)	1. Revised RID and Directive issued (Jun 2011) 2. Tender/s for phases 2C and 2D prepared (Oct 2011) 3. Contract for phases 2C and 2D awarded (Dec 2011) 4. Commence construction (Feb 2012) 5. Tenders for phases 2B, 2E and 2F prepared (Mar 2012)	1. Water delivery to Steel Bridge (Apr 2012) 2. Phases 2B, 2E and 2F tenders advertised and awarded. (Mar 2013)	1. Water delivery to Mooihoek (Mar 2013) 2. Phases 2B, 2E and 2F construction proceeding (Mar 2013)	Ongoing,	DWA and TCTA Implementation and co-funding by TCTA Site supervision by PSP Progress monitored by DWA	DWA on-budget portion, and TCTA off-budget financing R16,0 billion Social portion (minimum 60%) funded on-budget and commercial portion funded off-budget via TCTA Funding is not yet secured	DWA, Trans-Caledon Tunnel Authority (TCTA) NT
4.1.5 Mokolo - Crocodile Water Augmentation Project (MCWAP Phase 1)	1. Environmental authorisation obtained (Jan 2011) 2. Water Supply and Implementation Agreements concluded (Mar 2011) 3. Funding secured (Mar 2011) 4. Construction tenders advertised (Mar 2011)	1. Funding secured (Jun 2011) 2. Main contract awarded (Jun 2011) 3. Site establishment and commence construction (Sep 2011) 4. Incorporation of Exxaro existing infrastructure (Jun 2011)	1. Construction of pump station and pipeline continue (Mar 2012)	1. Commissioning and delivery of water and refurbishment of existing infrastructure. (Dec 2013)	Dec-13	Implementation and co-funding by TCTA Site supervision by PSP Progress monitored by DWA	R1,7 billion Social portion (25%) funded on-budget and commercial portion funded off-budget	DWA TCTA
4.1.6 Raising of Clanwilliam Dam	1. Agreement with SANRAL for realignment of Route N7 concluded (Dec 2010) 2. Agreement with CE:ES for design of raising concluded (Mar 2011)	1. Commencement of design of realignment of N7 (April 2011) 2. Commencement of design of dam raising (Apr 2011) 3. Commencement of Land acquisition process (Jun 2011) 4. Agreement with Dept of Transport concluded (Sept 2011)	1. Commencement of construction of realignment of N7 (Apr 2012) 2. Commencement of construction of dam raising (Apr 2012). 3. Commencement of design of minor roads by Dept of Transport (Jun 2012)	1. Construction of realignment of N7 completed (Sept 2013) 2. Commencement of construction of minor roads (Sept 2013)	Ongoing	Engineered and construction by DWA Site supervision by PSP	R1,9 billion on budget	DWA

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
4.1.7 Raising of Hazelmere Dam	1. PSP for design of civil works appointed (Mar 2011) 2. Agreement with CE:ES concluded (Dec 2010)	1. Commencement of design of civil works (Apr 2011) 2. Gate contractor appointed (April 2011) 3. Commencement of manufacturing of crest gates (Oct 2011) 4. Commencement of construction of civil works (Jan 2012)	1. Commencement of Installation of gates (May 2012) 2. Commencement of commissioning of gates (Oct 2012) 3. Civil works and project completed (Mar 2013)		31-Mar-13	Engineered and constructed by the private sector Site supervision by PSP Progress monitored by DWA	R116,5 million on budget	DWA
Sub-output 4.2 Sixty (60) new regional bulk water infrastructure systems developed								
4.2.1 Five (5) water treatment works (WTW) completed	4 projects completed namely: 1. Olifantspoort WTW Phase 1 completed (Feb 2011 2. Mthatha Bulk Water Intervention completed (May 2010 3. Hoxane WTW completed (Aug 2010) 4. Kenhardt BWS completed (Dec 2010)	0 projects completed	1 project completed namely: 1. Pudimoe (Naledi/ Taung. WTW completed (Feb 2013)	0 projects completed	4 projects ongoing, 1 project completed 2013/2/1	Implementation and co-funding by WSA and Water Boards Site supervision by PSP	R103.4 million, Bulk Infrastructure Grant	DWA, Water Service Authorities (WSAs)

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
4.2.2 Four (4) waste water treatment works (WWTW) completed and two (2) under construction	1 project completed namely: 1. Malangeni WWTW (Oct 2010)	1 project completed namely: 1. Tsantsabane bulk sewer (Mar 2012) 2 projects under construction namely: 1. Emfuleni Regional WWTW 2. Westonaria WWTW	1 project completed namely: 1. George sewage effluent re-use (Mar 2013) 2 projects under construction namely: 1. Emfuleni Regional WWTW 2. Westonaria WWTW	1 project completed namely: 1. Paarl WWTW (Oct 2013) 2 projects under construction namely: 1. Emfuleni Regional WWTW 2. Westonaria WWTW	Mar-14	Implementation and co-funding by WSA and Water Boards. Site supervision by PSP. Progress monitored by DWA and WSA	R332.5 million, Bulk Infrastructure Grant	DWA WSAs
4.2.3 Fourty seven (47) water supply schemes completed and two (2) under construction	1. 7 Projects completed 2 projects under construction 1. Greater Mbizana BWS 2. Nebo BWS	1. 9 Projects completed 2 projects under construction 1. Greater Mbizana BWS 2. Nebo BWS	1. 15 Projects completed 2 projects under construction 1. Greater Mbizana BWS 2. Nebo BWS	1. 16 Projects completed 2 projects under construction 1. Greater Mbizana BWS 2. Nebo BWS	2 projects ongoing, 47 completed by March 2014	Implementation and co-funding by WSA and Water Boards. Site supervision by PSP. Progress monitored by DWA and WSA	R5.33 billion, Bulk Infrastructure Grant	DWA WSAs
Sub-output 4.3 Existing water resources infrastructure maintained								
4.3.1 Twenty five (25) national dams rehabilitated Baseline: Rehabilitation of 14 dams in progress	6 national dams rehabilitated namely: 1. Glen Brock Dam, 2. Mankazana Dam, 3. Toleni Dam, 4. Gcuwa Dam, 5. Bospoort Dam 6. Acornhoek Dam	7 national dams rehabilitated namely: 1. Nsami Dam, 2. Molepo Dam, 3. Chunniespoort Dam, 4. Albertfalls Dam, 5. Magwa Dam, 6. Rust de Winter Dam 7. Klein Marico Poort Dam	6 additional dams to be rehabilitated	6 additional dams to be rehabilitated	Mar-14	DWA	DWA on-budget funding	DWA

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
4.3.2 Twenty eight (28) national water conveyance projects rehabilitated	1. S1 Balancing Dam-Orange-Riet 10% complete 2. Qamata GWS 4 balancing dams under construction 3. Ncora GWS 2 balancing dams under construction 4. Voelvlei GWS 24 Riviere canal rehabilitation 60% complete 5. Goukou GWS 1 siphon refurbished 6. Keiskammahoek GWS Cata Dam Pipeline refurbishment 100% complete 7. Loskop dam - Rehabilitation of canals (95km) 8. Doorndraai Dam & SterkRiver Canals Rehabilitation of canals (88km) 9. Albasini GWS Rehabilitation of canals (95 km) Middle Letaba Dam - Rehabilitation of canals (64 km)	1. S1 Balancing Dam-Orange-Riet 40% complete 2. Qamata GWS 5 balancing dams under construction 3. Ncora GWS 2 balancing dams under construction 4. Voelvlei GWS 24 Riviere canal rehabilitation 80% complete 5. Fish Sundays GWS Klipfontein canal rehabilitation 6. Magoebaskloof Dam (Politsi) - Rehabilitation of canals (17 km) 7. Lindleyspoort GWS - Relining of canals and structures 8. Marico Bosveld GWS - Relining of canals and structures 9. Vlakfontein Canal Rehabilitation: Two Projects Vlakfontein Canal Fill Area 2-3, Vlakfontein Canal Fill Area 4	1. S1 Balancing Dam-Orange-Riet 60% complete 2. Gamtoos GWS - Rehabilitation of Moolman siphon 3. Voelvlei GWS 24 Riviere canal rehabilitation 100% complete 4. Hartbeespoort Irrigation Board Canals - Rehabilitation of Canals (63 km) 5. Vlakfontein Canal Rehabilitation: Two Projects Vlakfontein Canal Fill Area 6-7, Vlakfontein Canal Fill Area 8	1. S1 Balancing Dam-Orange-Riet 100% complete 2. Vlakfontein Canal Rehabilitation: Two Projects Vlakfontein Canal Fill Area 9 and Vlakfontein Canal Fill Area 12.	Mar-14	DWA	R 2 billion	DWA

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 4.4 Regulation of the water sector improved								
4.4.1 Independent water economic regulator established	1. Draft study/ concept paper and stakeholder consultation completed (March 2011)	1. Study approved by the Minister (May 2011) 2. Legislation/ Amendments to existing legislation approved by Minister (March 2012)	1. Cabinet approval (May 2012) 2. Public consultation/ introduction of legislation to parliament (March 2013)	1. Parliamentary approval (April 2013) 2. Promulgation (April 2013) 3. Appointment of board and CEO (31 March 2014)	Mar-14	DWA staff and consultants	DWA baseline	DWA
Sub-output 4.5 Backlog in the issuing of water licenses removed								
4.5.1 Additional outstanding licenses (as per backlog definition) finalised	1. 100% complete (March 2011)				Mar-11	DWA	DWA baseline	DWA
Sub-output 4.6 Raw water pricing strategy, funding model and institutional structures for infrastructure delivery reviewed								
4.6.1 Water pricing strategy and funding model revised	1. Consultations with stakeholders (March 2011)	1. Study socio-economic impact of the revision of the pricing strategy (March 2012) 2. Drafts approved by Minister (March 2012)	1. Release for public comment and consultation (April 2012) 2. Draft submitted to cabinet (November 2012) 3. Cabinet approval (November 2012)	1. Strategy and funding model gazzetted (September 2013) 2. Strategy and funding model receives the concurrency of the Minister of Finance (June 2013)	Jun-13	DWA staff and consultants	DWA baseline	DWA
4.6.2 Feasibility report on the review of institutional structures for water infrastructure delivery		1. Report on proposed sustainable institutional structures including stakeholder views 2. Report with recommendations approved by Minister	1. Cabinet Memo on proposed models prepared , submitted to cabinet and approved 2. Submit final report to cabinet.	1. Implementation plan and budget arrangements with National Treasury.	Mar-13	DWA staff and consultants	DWA baseline (R10m)	DWA

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Output 5: Information and communication technology								
Sub-output 5.1: Increase Broadband Penetration								
Sub-outputs: Establishment and Operation of Broadband Inter-Governmental Implementation Committee Development of National Broadband legislation Implement E-Connectivity projects Reduction of wholesale broadband prices Development of Wholesale Infrastructure	1. 2% of Households connected to Broadband	1. 4% of Households connected to Broadband	1. 7% of Households connected to Broadband	1. 10% of Households connected to Broadband	Apr-14	Existing DoC human resources will be used. External Data Collection Institutions used for penetration monitoring.	R 1.5 Mil for Annual Surveys from DoC budget.	DoC, Sentech, USAASA Provinces Municipalities
Sub-output 5.1.1: Establishment and Operation of Broadband Inter-Governmental Implementation Committee								
1. Detailed activity: Draft terms of reference Set up Inter-governmental committee Development of Implementation Plan by Mar 2011 Align and coordinate all broadband initiatives Monitor progress on implementation target Committee reports to Minister bi-annually	1. Drafting terms of reference 2. Intergovernmental committee set up 3. Inaugural meeting; Nov 2010 4. Development of Implementation Plan by Mar 2011	1. Alignment and coordination of all broadband initiatives as per implementation plan 2. Monitor progress on implementation target and Report on Broadband targets achieved 3. Committee reports to Minister bi-annually	1. Alignment and coordination of all broadband initiatives as per implementation plan 2. Monitor progress on implementation target and Report on Broadband targets achieved 3. Committee reports to Minister bi-annually	1. Alignment and coordination of all broadband initiatives as per implementation plan 2. Monitor progress on implementation target and Report on Broadband targets achieved 3. Committee reports to Minister bi-annually	Mar-14	Existing human resources will be used	R93 700 estimated costs from departmental budget	DoC Provinces Municipalities
Sub-output 5.1.2: Development of National Broadband legislation								
1. Development of draft broadband legislation for ministerial approval Consultation meetings with stake holders Submission to cabinet Submission to parliament	1. Ministerial approval of draft ECA amendments 2. All stakeholders consulted (within and outside of Government)	1. Cabinet approval, Bill introduced in parliament	1. Parliamentary approval of ECA amendments	1. Promulgation of ECA amendments	Mar-14	Existing DoC human resources will be used.	R1 500 000 estimated from departmental budget	DoC ICASA

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 5.1.3: e-Connectivity project implemented								
1. Enhance the roll-out of the broadband connectivity in schools so as to improve the quality of teaching and learning. Memorandum of Understanding signed by DoC and DBE, signed off User Requirements, the development of the Business Case	1. Connectivity plan for schools approved, Implementation plan including funding approved	1) 5500 schools connected	1) 9000 schools connected	1) 9000 schools connected	Mar-14	Existing Human Resources in the DoC and DBE (already have a project team in place)	Funding plan is being developed as part of the Implementation Plan	DoC DBE National Treasury
Sub-output 5.1.4: Reduction of wholesale broadband prices								
1. Reduce wholesale broadband prices by 30 % by 2014 through policy intervention, monitoring and reporting on the regulation of: mobile interconnection charges in line with ECA, fast racking interconnection & facilities leasing regulations, setting of mobile termination rate, review of the composition of basket of services for mobile tariffs, review of ECA and licensing conditions to ease barriers to entry	1) 8.5% reduction of wholesale broadband prices over previous year	1) 8.5% reduction of wholesale broadband prices over previous year	1) 8.5% reduction of wholesale broadband prices over previous year	1) 8.5% reduction of wholesale broadband prices over previous year	30% reduction by March 2014	DoC ICASA	R1 million from internal budgets	DoC ICASA
2. Introduce a developmental pricing model for the BPO sector	1. Developed concept, presented to Top Management	1. Submit to FOSAD and Cabinet	1. Implement the Developmental Pricing Model for BPO	1. Monitor and report on the implementation of the Developmental Pricing Model for BPO	Mar-14	DOC DTI	R1.5 million on dept budget	DOC DTI
3. Facilitate the reduction in MTR for Telkom public telephones	1. Amend schedule 1 of the determination issued under ECA 2005 on universal access to the provision of Electronic Communication Services	1. Support ICASA to facilitate symmetric General public phone interconnection rate among electronic communications network service providers	1. Monitor the implementation of symmetry general public phone interconnection rate among electronic communications network service providers	1. Monitor the implementation of symmetry general public phone interconnection rate among electronic communications network service providers	Mar-14	DoC ICASA	DoC ICASA	DoC ICASA

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 5.1.5: Development of Wholesale Infrastructure								
1. Establish Broadband Points of Presence in Major Cities	1. 18 POPs developed in Major Cities.				Mar-11	Existing Human Resources in the DPE and Broadband Infraco.	Existing Financial Resources already allocated to Broadband Infraco.	DPE Broadband Infraco. DoC
2. Establish Broadband Points of Presence to provide connectivity and access in under-serviced areas	1. 3 POPs developed in underser-viced Areas.	1. 8 POPs de-veloped in Underser-viced Areas.	1. 12 POPs developed in Under-serviced Areas.	1. 18 POPs developed in Under-serviced Areas.	Mar-14	Existing Human Resources in the DPE and Broadband Infraco.	Existing Financial Resources already allocated to Broadband Infraco.	DPE, Broadband Infraco, DoC
Sub-output 5.2: 2010 Legacy Projects Implemented								
Sub-output 5.2.1: Implementation of the Legacy Plan on future utilisation of ICT infrastructure rolled out for the 2010 FIFA World Cup facilitated								
1. Develop Implementation plan Consult with municipalities on redeployment of redundant world cup ICT infrastructure: - Identification of equipment list - Determination of monetary value - Handover of equipment - Integration of equipment into municipal broadband networks Telkom buy-back of redundant equipment: - Identification of equipment list - Determination of monetary value - Handover of equipment - Integration of equipment into Telkom's core network, use equipment to connect 125 Dinaledi schools Sentech's Second Teleport to serve as back-up to Honeydew	1. Implemen-tation plan developed 2. Telkom buy-back of redundant equipment 3. Legacy Projects: 4. Equipment redeploy-ment to two host cities (Cape Town and Tshwane) 5. 125 Dinal-edi schools connected 6. Sentech's Second Teleport completed				Mar-11	Existing DoC human resources will be used for rollout monitoring.	Existing Financial Resources already allocated and contracted (1,083.00 mil) contracted to Telkom for the 2010 ICT Guarantees Projects will be used.	DoC Host cities Telkom DBE

Activities	Milestones/deliverables				Time (completed by)	Resource requirements		Roles and responsibilities
	Year 1: 2010/2011	Year 2: 2011/12	Year 3: 2012/2013	Year 4: 2013/2014		Human resources	Financial resources	
Sub-output 5.3: DTT Rollout								
1. Implement and monitor progress on DTT Rollout - migration from analogue broadcasting signal to digital signals	1. 60% DTT rollout	1. 80% DTT rollout	1. 96% DTT rollout		96% DTT rollout by March 2013	Existing DoC human resources will be used for rollout monitoring.	Existing Financial Resources already allocated to Sentech will be used for rollout. Mar-11 R414 800.00 Mar- 2 R456 200.00 Mar-13 R514 700.00	Doc manage and monitor project implementation and facilitate the rollout of DTT transmission infrastructure Sentech Purchase, install, operate and maintain DTT transmission equipment
Sub-output 5.4: Local Loop Unbundling								
5.4.1. Develop implementation plan and issue Policy directive to ICASA for the unbundling of the local loop by 2011	1. Draft proposals on local loop unbundling approved by Minister	1. Submission of report to cabinet on implementation plan for local loop unbundling; Policy directives to ICASA issued upon cabinet approval			Dec-11	Existing DoC resources	DoC baseline	DOC ICASA

Notes

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