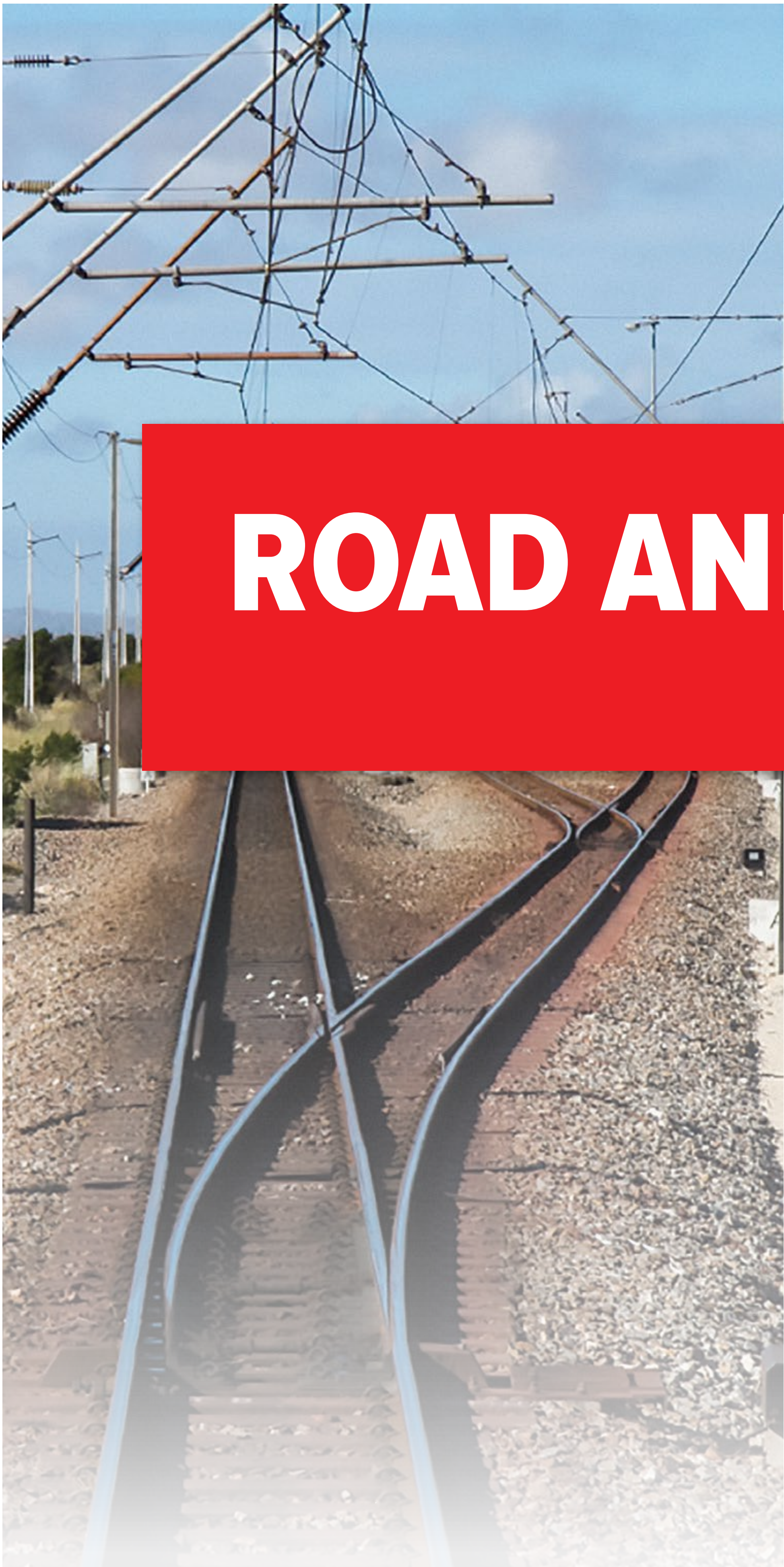

ROAD AND RAIL

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A review of South Africa's road and rail sectors

The material in this report was compiled by Chanel de Bruyn and the Research Unit of Creamer Media (Pty) Ltd, based in Johannesburg.

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Report edited by Sheila Barradas, David Shepherd and Ria Theron.

Ordering information
To subscribe to *Research Channel Africa* or purchase this report contact:
Creamer Media (Pty) Ltd
tel +27 11 622 3744 or
email **subscriptions@creamermedia.co.za**

Cover picture by Duane Daws

Picture by Duane Daws

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List of abbreviations

Becsa	BHP Billiton Energy Coal South Africa
Bombela	Bombela Concession Company
BRT	bus rapid transit
BTSA	Bombardier Transportation South Africa
Busa	Business Unity South Africa
capex	capital expenditure
CBD	central business district
Cesa	Consulting Engineers South Africa
CNR	China North Rail
CNR RSSA	China North Rail Rolling Stock South Africa
CSR	China South Rail
DA	Democratic Alliance
DoT	Department of Transport
E-toll	electronic tolling
GE	General Electric
GFB	General Freight Business
GFIP	Gauteng Freeway Improvement Project
GMA	Gautrain Management Agency
IRPTN	integrated rapid public transport network
JV	joint venture
MDS	Market Demand Strategy
MLPS	mainline passenger service
MoU	memorandum of understanding
MTEF	Medium-Term Expenditure Framework
Nactu	National Council of Trade Unions
NHTS	National Household Travel Survey
Outa	Opposition to Urban Tolling Alliance
PPC	Protea Parkway Consortium
PRASA	Passenger Rail Agency of South Africa
PRMG	Provincial Road Maintenance Grants
PrDP	professional driving permits
RFA	Road Freight Association
RTMC	Road Traffic Management Corporation
Sabita	South African Bitumen Association
Saboa	South African Bus Operators Association
Salga	South African Local Government Association
Sanral	South African National Roads Agency Limited
SARF	South African Road Federation
SCA	Supreme Court of Appeal
Stats SA	Statistics South Africa
TCT	Transport for Cape Town
TE	Transnet Engineering
TFR	Transnet Freight Rail
TMC	traffic management centre
TRP	Taxi Recapitalisation Programme
TRT	Tshwane Rapid Transit
TMC	Traffic Management Centre

Picture by Duane Daws

Key developments

August 2014: KwaZulu-Natal Transport MEC Willies Mchunu says the provincial roads department requires R17-billion to reduce the backlog in road maintenance.

August 2014: The National Council of Trade Unions and Business Unity South Africa tells the Gauteng Advisory Panel on the Socioeconomic Impact of e-tolls that a national fuel levy is a better source of revenue than tolling to fund the upgrade of Gauteng's roads.

October 2014: South African National Roads Agency Limited CEO Nazir Alli says the funding backlog for the development of South Africa's roads has increased to R197-billion, from R149-billion in 2010.

October 2014: Transnet Freight Rail says it has acquired 34 second-hand diesel locomotives from Australian rail company Aurizon, at a cost of between A$180 000 and $230 000 each, to boost its general freight fleet ahead of the procurement of new locomotives by 2019.

November 2014: Metrorail decides to cancel some of its mainline passenger service routes, owing to low passenger numbers and cost recovery challenges.

November 2014: South African National Roads Agency Limited CEO Nazir Alli tells the Gauteng Advisory Panel on the Socioeconomic Impact of e-tolls that an additional 16c/ℓ will have to be added to the fuel levy to pay for the Gauteng Freeway Improvement Project in lieu of a potential rescinding of e-tolls.

November 2014: Transnet Engineering showcases its new automated, level-crossing traffic-control system that will prevent collisions between vehicles and trains at level crossings.

November 2014: The Gibela Consortium unveils the first car body-shell of the first X'Trapolis Mega train built at its Lapa facility, in Brazil, as part of the Passenger Rail Agency of South Africa's rolling stock fleet renewal programme.

January 2015: Gauteng Premier David Makhura releases the findings of a report following the conclusion of the Gauteng Advisory Panel on the Socioeconomic Impact of e-tolls, stating that more than 50 recommendations had been made by the advisory panel. One recommendation involves the implementation of a hybrid funding model to fund the Gauteng Freeway Improvement Project.

January 2015: Transport Minister Dipuo Peters reveals in a Parliamentary reply that 93 292 e-toll accounts had been deregistered by September 2014.

February 2015: President Jacob Zuma says R6-billion will be invested in the planning and implementation of integrated public transport networks in 13 cities during the 2016 financial year.

February 2015: National Treasury says R1.1-billion has been reprioritised from the taxi recapitalisation programme and other road budgets for the upgrade of the R573 Moloto road, which the South African National Roads Agency will now manage.

February 2015: Finance Minister Nhlanhla Nene confirms that Gauteng Freeway Improvement Project road users will continue paying tolls.

March 2015: The Democratic Alliance calls on the Parliamentary Portfolio Committee on Transport to request South African National Roads Agency Limited CEO Nazir Alli to explain why there has been a delay in pursuing legal claims against companies implicated in collusive tendering on certain road projects.

March 2015: Transnet announces that it has secured two funding agreements, worth a collective R13-billion, with the Export–Import Bank of the US and Export Development Canada in support of Transnet Freight Rail's acquisition of diesel and electric locomotives from General Electric and Bombardier.

March 2015: The Supreme Court of Appeal in Bloemfontein allows the City of Cape Town to reveal to the public details of the proposed N1/N2 Winelands Highway project. The city says proposed tariffs for the project will amount to about 84.95c/km, three times that of the e-tolls charged for using the Gauteng Freeway Improvement Project.

March 2015: Bus operator Putco bemoans the dis-proportionate funding provided by government for the operations of bus rapid transit systems, to the detriment of conventional bus services, with these operators facing cash flow and profitability issues as a result.

March 2015: Transnet says it expects to finalise all take-or-pay contracts with coal miners for its coal export line by the end of the 2015 financial year.

Key developments

(continued)

March 2015: The Passenger Rail Agency of South Africa announces that its CEO Lucky Montana intends to step down in 2016.

April 2015: South African National Roads Agency Limited CEO Nazir Alli says toll tariffs for the N1/N2 Winelands toll project have not been set and may only be determined by the Transport Minister.

April 2015: The Gauteng Department of Roads and Transport awards the first tender as part of the Gauteng province's pilot open-tender process.

April 2015: Outgoing Passenger Rail Agency of South Africa CEO Lucky Montana says the organisation hopes to unlock R1-billion a year from its property portfolio from 2018 onwards to help subsidise its Metrorail services.

April 2015: A media report reveals that the South African National Roads Agency Limited's e-toll collections continue to decline, with the agency having collected only 62% of its fore-cast e-toll revenue in the financial year ended February 2015.

April 2015: Transnet appoints Siyabonga Gama as acting group CEO, following Brian Molefe's secondment as acting CEO of State-owned power utility Eskom.

May 2015: Deputy President Cyril Ramaphosa announces a new e-toll dispensation, including a standard tariff of 30c/km for light vehicles and a reduction in the monthly cap to R225.

June 2015: Transnet secures a R30-billion loan from China Development Bank for the acquisition of locomotives as part of its 1 064 programme.

July 2015: The South African National Roads Agency Limited announces that it will start the process to appoint a new CEO, ahead of Nazir Alli's retirement in August.

July 2015: Allegations emerge that locomotives acquired by Passenger Rail Agency of South Africa (PRASA) from Spain-based Vossloh are too tall for local infrastructure. Subsequently, PRASA CEO Lucky Montana is asked to step down six months earlier than planned, while chief rail engineer Dr Daniel Mtimkulu is fired for allegedly having misrepresented his qualifications.

Picture by Duane Daws

Introduction

South Africa's road and rail infrastructure is essential to transport goods and people and, therefore, impacts significantly on the economy. The country is investing heavily in improving the state of its road network, as well as its rail infrastructure.

While the national roads, which are managed by the South African National Roads Agency Limited (Sanral), are generally in a good condition, the state of the country's provincial and municipal road networks has been deteriorating. Although there is investment in these road networks, the level of funding is insufficient and Sanral estimates that the country has a R197-billion backlog for the development of roads. Some key provincial roads are being placed under the management of Sanral to ensure that they are upgraded and maintained. One such example is the R573 Moloto road, on which many serious vehicle accidents occur every year, resulting in many fatalities.

Meanwhile, the roads agency continues to struggle to collect toll fees along the Gauteng Freeway Improvement Project routes. Although Sanral's tolled road network comprises only a small portion of its overall network, the nonpayment of toll fees has a significant impact on its abilities to repay debt and to maintain its toll road portfolio. There is strong opposition to the payment of tariffs through an electronic tolling (e-tolling) system and the uncertainty about this system has impacted on Sanral's ability to raise funding in monthly bond auctions.

The implementation of e-tolling has also fuelled discontent in other parts of the country, where Sanral plans to fund the upgrade of certain roads through the introduction of tolls, with residents saying they do not want to pay e-tolls. Although Sanral has said that it will not introduce e-tolling on these routes, there is concern about the high toll tariffs that could be charged for using

Picture by Duane Daws

these roads and the impact this could have, particularly on the poor.

Meanwhile, South Africa continues to transport much of its freight by road, rather than rail, which leads to further deterioration of the road network.

Heavy-vehicle accidents also result in a significant cost to the public, while truck hijackings are increasing. Efforts continue to transfer more rail-friendly freight back onto the rail system, but progress is slow.

In terms of the movement of people, the South African Bus Operators Association indicates that about 80% of the country's population depends on bus, commuter rail and taxi services to get to and from work.

Data provided by Statistics South Africa (Stats SA) supports this, with the National Household Travel Survey (NHTS) 2013, the results of which were released in July 2014, showing that the use of public transport had increased between 2003, when the previous household travel survey was undertaken, and 2013. The NHTS 2013 outlines that the percentage of households using taxis increased from 59% to 69% from 2003 to 2013, while the percentage of households that uses buses increased from 16.6% to 20.2% and the percentage of households that uses trains increased from 5.7% to 9.9%. The results of the next NHTS will be released by Stats SA in 2018.

While the majority of commuters still rely on taxis for transportation, the acceptance of bus rapid transit (BRT) systems is growing and many cities are investing, or considering investing, in either BRT or integrated rapid public transport networks (IRPTNs). In his State of the Nation Address in February, President Jacob Zuma declared that R6-billion would be spent in 13 cities for the planning and implementation of IRPTNs during the 2016 financial year.

Further, the Passenger Rail Agency of South Africa is working on improving its services. It is undertaking a R123-billion rolling stock fleet renewal plan that will result in the introduction of more modern and safe trains for public transport over the next 20 years. The agency is also investing in improving its infrastructure, particularly the upgrade of its rail stations and rail signalling systems.

Meanwhile, as part of government's ambition to transition more rail-friendly freight from the road network to rail, State-owned freight logistics group Transnet has embarked on a R312-billion investment programme to improve its operations. More than R200-billion of this will be invested in its rail operations, with Transnet Freight Rail (TFR) working to expand its coal, iron-ore and manganese export lines, as well as its general freight operations. TFR will acquire more than 1 300 new locomotives in the next few years to expand its operations.

Picture by Duane Daws

Road infrastructure in South Africa

The size and state of the road network

The South African Bitumen Association (Sabita) reports that South Africa's road network stretches an estimated 750 000 km. State-owned South African National Roads Agency Limited (Sanral) adds that the country's road network is the tenth-longest and the eighteenth-longest paved network in the world. The replacement cost of the network is estimated at about R2-trillion.

Just over 618 000 km of the overall network are classified as proclaimed roads, of which 3% are national, 45% provincial and 52% municipal roads. Sabita points out that about 74% of the proclaimed roads are unpaved.

A further 131 900 km are classified as unproclaimed roads – roads that have not formally been included in road inventories and whose maintenance no tier of government is responsible as yet. The unproclaimed roads are mainly situated in rural areas.

The national road network, which is the responsibility of the Sanral had increased to 21 403 km by October 2014, compared with 6 800 km when Sanral was established in 1998. The roads agency funds the development and maintenance of about 18 283 km of the national network from a yearly budget of about R11-billion, while the remaining 3 120 km are tolled. The national road network is expected to eventually be expanded to 35 000 km.

The South African road network

Authority	Paved	Gravel	Total
Provincial	49 047 km	226 273 km	275 320 km
National*	21 403 km	0 km	21 403 km
Metropolitan municipalities	51 682 km	14 461 km	66 143 km
Other municipalities	37 691 km	219 223 km	256 914 km

Source: South African Bitumen Association and Sanral
*Figures provided by Sanral

The 275 320 km of provincial roads primarily provide access and mobility within the respective provinces. The roads are maintained by the various provincial departments in eight of South Africa's nine provinces. However, in Limpopo, Roads Agency Limpopo is responsible for the provincial road network.

A further 256 914 km of road is managed and maintained by various local and district municipalities across the country, while eight metropolitan municipalities are responsible for 66 143 km of the overall proclaimed South African road network.

Sabita notes that the condition of the South African road network has been steadily declining since 1991, particularly at a provincial and municipal level.

Sanral road network manager Louw Kannemeyer noted in a September 2014 presentation that 14.45% of its paved national road network was in a very good condition, 33.4% in a good condition, 41.15% in a fair condition, 10.29% in poor condition and 0.71% in a very poor condition.

The roads agency highlights, however, that it is frequently required to incorporate strategic provincial roads that are often in a poor or very poor state into its network.

Sanral revealed in October 2014 that it had included 1 628 km of roads in Limpopo to the Sanral network, taking the total kilometres of road in the province under its management to 3 550 km. The roads agency said millions of rands would be spent on upgrading the N1 Ring road, the Musina Ring road and the Mokopane Northern Ring road in the province.

Meanwhile, Kannemeyer further pointed out that, of the paved provincial roads, 11.66% were in a very good condition, 25.93% in a good condition, 36.07% in a fair condition, 20.07% in a poor condition and 6.27% in a very poor condition. Of the gravel provincial roads, 1.34% were in a very good condition, 6.65% in a good condition, 24.93% in a fair condition, 40.43% in a poor condition and 26.64% in a very poor condition.

KwaZulu-Natal Transport MEC Willies Mchunu told the provincial legislature in August 2014 that the provincial department needed R17-billion to reduce the backlog in road maintenance. He said the department had a budget of R9-billion to maintain the 7 400 km of roads under its jurisdiction and that this funding was insufficient. He added that the province's rate of poor roads stood at 43%, much higher than the global benchmark of 10%.

Government has instituted a Provincial Road Maintenance Grant (PRMG) to fund maintenance on South Africa's provincial road network, to decrease the number of kilometres of the secondary road network that is in poor or very poor condition to 51 000 km by 2014/15, compared with 65 966 km in 2008/9.

According to the 2015 budget, National Treasury has allocated R9.85-billion, R10.14-billion and R10.81-billion for the PRMG for the 2015/16, 2016/17 and 2017/18 financial years respectively.

Treasury, in collaboration with the Department of Planning, Monitoring and Evaluation in the Presidency, has undertaken performance and expenditure reviews to ensure the delivery of social services in a cost-effective manner and, where it has not, proposed reforms to ensure that cost efficiencies are improved. In the 2015/16 financial year, these two government departments plan to undertake performance and expenditure reviews in several other areas, including provincial roads.

Funding South Africa's roads

Sanral CEO Nazir Alli told delegates at a Transport Forum event in October 2014 that the funding backlog for the development of South Africa's roads – including strengthening and regravelling, but excluding periodic resurfacing, upgrading, adding new lanes and the construction of new roads – had increased to R197-billion, compared with the backlog of R149-billion in 2010.

Sanral engineering executive Koos Smit, meanwhile, says the roads agency will have to spend about R20-billion to reduce its own backlog.

The agency receives about R11-billion a year in funding from National Treasury to improve and maintain the national nontoll road network, which represents 84% of its network. Sanral spent R4.8-billion on maintaining the national nontoll roads in the 2014 financial year, while a further R6.2-billion was spent on strengthening and improving them.

The roads agency will, over the medium-term expenditure framework (MTEF) period to 2017/18 receive R39.1-billion in budget allocations to maintain the nontoll road network under its jurisdiction.

In the 2015 national budget, National Treasury has indicated out that Sanral will likely spend R15.6-billion in capital expenditure (capex) during the 2014/15 financial year. The agency's capex spend in the 2015/16 financial year will remain at about R15.6-billion, but will decrease to R13.8-billion in 2016/17 and to R14.3-billion in 2017/18. Treasury notes that Sanral's capex will decline over the medium term, as a result of uncertainty about sources of revenue to finance the Gauteng Freeway Improvement Project (GFIP), which affects the agency's ability to raise funding for the rest of its toll portfolio.

Large-scale expansion projects to be undertaken by Sanral in the medium term include the expansion of the N3 at Mariannhill, the building of additional lanes on the N2 North Coast road and upgrades to the N2 Winelands routes.

In its 2014 annual report, Sanral notes that the funding allocation from National Treasury has steadily increased since 2004, but that higher input material costs and the increase in kilometres of the road network under its jurisdiction have offset any gains.

The roads agency says there is a significant financial impact on Sanral when roads previously maintained by provincial authorities are incorporated into the national network. Sanral uses funding from the fiscus, the collection of tolls – the user-pays principle – and the private-sector to meet its funding challenges.

The notoriously dangerous R573 Moloto road, in Mpumalanga, for instance, will be added to Sanral's nontoll portfolio in 2015 to ensure that the road is upgraded and safety is improved. Accidents on this road have resulted in many fatalities in recent years and National Treasury has reprioritised R1.1-billion from the taxi recapitalisation programme and other road budgets to upgrade it. This includes R149-million of funding that was reprioritised from the PRMG to Sanral over the MTEF period to 2017/18.

Meanwhile, Sanral's toll road portfolio, which comprises about 3 120 km, is funded through tolling revenues collected by the roads agency and private-sector concessionaires that manage certain roads on Sanral's behalf. Sanral earned R3.5-billion in revenue from its toll portfolio in 2013/14 – 65.7% higher than the R2.1-billion earned in 2012/13. The increase was driven by higher traffic on existing toll roads; the opening of new toll plazas on the R30, in the Free State, and the N17, between Gauteng and Mpumalanga; and the start of e-tolls on the GFIP, with the GFIP having contributed R1.2-billion to revenue.

Municipal road improvements are funded through equitable share allocations from Treasury and from municipal revenues.

The South African Local Government Association (Salga) has called for the establishment of a dedicated road infrastructure grant for municipalities, as allocations from Treasury have been used to provide road infrastructure, but not to maintain and rehabilitate it, with these functions to be funded from municipal revenues. Salga argues, however, that in some municipal areas, there is no tax base to fund the maintenance and rehabilitation of roads.

It therefore suggests that the various road-funding streams, such as the Municipal Infrastructure Grant and the Urban Settlements Development grant, as well as the fuel levy be ring-fenced to provide funding for the provision and maintenance of municipal road infrastructure.

Meanwhile, the Department of Transport (DoT) administers the Rural Roads Asset Management Systems grant, which funds the collection of data on the condition and use of rural roads, as well as the spending of infrastructure grants, by district municipalities. The data is used to plan for road maintenance on the rural roads in each district. This grant amounts to R305.7-million over the MTEF period to 2017/18.

Further, Treasury has also, in the 2015 Budget, committed funds to repair infrastructure damaged during natural disasters, such as the earthquake in the City of Matlosana, in the North West, in August 2014. R648-million has been allocated for the repair of roads damaged in natural disasters.

Sanral CEO to retire

After 17 years at the helm of South African National Roads Agency Limited (Sanral), Nazir Alli will soon retire. Although he had been expected to step down as CEO in August 2015, the exact date will be determined by Transport Minister Dipuo Peters and the Sanral board and will depend on the appointment of a succesor.

The roads agency announced in July 2015 that it would start the process of recruiting a new CEO, stating that it was seeking to appoint a "visionary leader" who was also a qualified civil engineer.

"The person must have extensive experience at senior management level accompanied by a solid record of leading a similar or similar-sized organisation. He or she must be a person of influence, who will be charged with developing a tactical plan to advance the company's mission, vision and objectives," stated Sanral.

Source: *Engineering News*

Toll roads

About 3 120 km of South Africa's national roads are operated as toll roads using the user-pays principle. Sanral has entered into 30-year public–private partnerships with three entities to operate 1 288 km of the network as concessions.

Trans African Concessions, or TRAC, manages a 570 km stretch of road, the Maputo Development Corridor, or N4 East, between Tshwane and the Port of Maputo, in Mozambique. N3 Toll Concession (N3TC) operates a 415 km stretch of road – the N3 – between Heidelberg, Gauteng, and Cedara, in KwaZulu-Natal. The Bakwena Platinum Corridor Concessionaire manages a 90 km stretch of road on the N1 from Tshwane to Bela Bela, and a 295 km stretch of road on the N4 West from Tswhane to the Botswana border. These concessions will end in 2028, 2029 and 2031 respectively.

Sanral manages the balance of South Africa's toll roads – about 1 832 km – and funds their maintenance and expansion through financing raised on the capital markets. Its debt repayment is about R3.5-billion a year. The roads agency earned about R3.5-billion in revenue from toll operations in the 2013/14 financial year, an increase of nearly 66% on the R2.1-billion earned the year before. The higher revenue was attributable to the operation of new toll plazas on the R30 and the N17, as well as the R1.2-billion in revenue generated by the roll-out of the first phase of the GFIP.

Through the GFIP, Sanral plans to upgrade and build new freeway sections to eventually create a 560 km freeway network. Construction on the first phase of the GFIP, which entailed the upgrade of 201 km of highways in the province, started in 2007. The work, which was completed in 15 separate work packages, involved widening the most congested highways and interchanges in Gauteng. Construction was largely completed by the end of 2010.

The roads agency is planning to spend R2.9-billion on rehabilitation projects on the GFIP from 2020 to 2030, and a further R8.8-billion beyond 2030.

Sanral opted for the user-pays principle, through the implementation of e-tolling, to repay the about R20-billion in debt it incurred for the upgrades. However, there has been widespread opposition to e-tolling since its inception on Gauteng's highways, with complaints about the high administrative costs of the system and the high cost of e-tolls. This led to delays in the implementation of e-tolling, which resulted in some uncertainty about Sanral's ability to repay its debt. Transport Minister Dipuo Peters approved e-tolling in late 2013, with e-tolls officially implemented in December 2013.

The agency had, during 2014, embarked on monthly bond auctions to raise R5.5-billion to fund its operations and repay some short-term debt. The first of these auctions, in April 2014, raised R500-million, followed by two more auctions in May and June 2014, each raising R500-million. However, during July 2014, Gauteng Premier David Makhura announced that he would set up a review panel to assess the socioeconomic impact of e-tolls on the province, which again caused some uncertainty about the future of e-tolls, leading to a shortfall of R225-million in the capital raised during that month. Its latest bond auction in April 2015 attracted only one bidder, with Sanral managing to raise only R270-million of the R600-million it had wanted to raise.

Meanwhile, many road users in the province refuse to pay e-tolls, despite the cost of the e-tolls having been reduced from the initially proposed rates.

By August 2014, Peters acknowledged that only about one-million people had registered and had active e-tag accounts, with unpaid e-toll bills reaching R1-billion. The Opposition to Urban Tolling Alliance (Outa) has argued that less than half – with only about 40% of vehicles using the GFIP roads having e-tags – of the road users were paying for e-tolls and that this pointed to the failure of the user-pays system. Further, Outa said the number of road users paying for e-tolls was declining, a fact later acknowledged by Peters, who stated in a January 2015 Parliamentary reply to Freedom Front Plus MP Anton Alberts that 93 292 e-toll accounts had been deregistered by September 2014 in the face of widespread noncompliance.

It emerged in April 2015 that Sanral had, as at the end of February 2015, managed to collect only 62% of its forecast e-toll revenue for the financial year, with an e-toll shortfall of R588-million, prompting it to ask National Treasury to increase the level of debt it is allowed to carry.

Peters had revealed in January 2015 that the income from e-tolls had reached a peak of R120-million in June 2014, but that income had then decreased to R119-million in July 2014, R98-million in August 2014 and R86-million by September 2014. Sanral had hoped to raise about R300-million a month in e-toll revenue, but had raised only R45-million in January 2015 and R61-million in February 2015. Sanral CFO Inge Mulder told Moneyweb in April 2015 that only about 262 000 key account holders were regularly paying their e-tolls, representing about 22% of all registered GFIP road users. Given the decrease in e-toll collections, Sanral is funding its e-toll operations from debt.

Throughout 2014, various people and organisations debated whether the implementation of e-tolling on Phase 1 of the GFIP was the best option, with many arguing that a fuel levy, instead of tolling, should be used to fund the development and maintenance of roads, including the GFIP.

National Council of Trade Unions (Nactu) project manager Thulani Khumalo told the advisory panel on the socioeconomic impact of e-tolls in August 2014

Advisory panel on socioeconomic impact of e-tolls

Gauteng Premier David Makhura announced in July 2014 that a panel would be established to review the socioeconomic impact of e-tolls on Gauteng and to make recommendations on the feasibility of possible alternatives to fund the GFIP upgrades. The Premier appointed 15 people, including chairperson Muxe Nkondo, who were expected to present their recommendations to the Gauteng provincial government by November 2014.

Picture by Duane Daws

Source: *Engineering News*

that a national fuel levy would be a better source of revenue to fund the upgrade and maintenance of Gauteng's highways, as well as future road projects. Nactu believed e-tolling would eventually also be implemented elsewhere in the country.

Business Unity South Africa (Busa) economic policy executive director Kgatlaki Ngoasheng also told the panel that Busa was in favour of the implementation of a fuel levy, stating that about 10c/ℓ would have to be added to the fuel levy to cover the costs of the repayment of the GFIP debt.

However, Sanral CEO Nazir Alli has argued on several occasions that increasing the fuel levy will not be in the best interests of motorists or the country. In a November 2014 submission to the advisory panel, he said an additional 16c/ℓ would have to be added to the fuel levy to pay for the GFIP in lieu of a possible rescinding of e-tolls. A further R1/ℓ would have to be added to the fuel levy if the R65.8-billion in costs to maintain the national road network were to be funded through the fuel levy. He stated that this was not adequate or equitable, as citizens outside Gauteng would pay to upgrade roads they did not use.

Transport Minister Dipuo Peters agreed that using a fuel levy to fund upgrades on Gauteng highways was "unfair". She further commented that while the e-toll system was not a perfect solution, it was lawful and was not implemented without due consideration of all options and payment alternatives.

Alli further argued that increasing the fuel levy would not alleviate road congestion, as users would then not be encouraged to use alternative roads and that trucks and heavy vehicles, which did more damage to roads than light vehicles, would pay "proportionately less" than private vehicle owners for the road upgrades. He concluded that, as vehicles were becoming more fuel-efficient, the amount of fuel sold over the long term would decrease, which would necessitate further increases in the fuel levy.

Consulting Engineers South Africa (Cesa) agreed with Sanral and the Minister, with contractual affairs manager Wallace Mayne telling the panel that increasing the fuel levy would spread the burden among the entire population and that past experience had proved that the fuel levy was diverted elsewhere

Heavily overloaded trucks can literally rip up asphalt in summer heat

Overload control statistics for 2014 show that just more than two-million vehicles were weighed at South African weighbridges, with 20%, or 416 364, of these overloaded, Council for Scientific and Industrial Research (CSIR) Built Environment network asset management system research group leader Dr Paul Nordengen has said.

However, the number of chargeable offences – in other words, the vehicles exceeding a prescribed tolerance level necessary for prosecution – was only 2.6%, or 53 525 vehicles.

Most vehicles weighed were on Mpumalanga's N4 corridor, at 669 000 vehicles, with the Eastern Cape weighing only 65 vehicles in 2014.

The vehicles weighed include bakkies, buses, small trucks and large trucks.

The statistics cannot be expanded to generalise about the trend of overloading in South Africa, as not all vehicles are weighed at weighbridges, and weighbridges are largely located along major transport arteries.

Nordengen estimates the damage to South Africa's road network owing to overloading at an estimated R1-billion a year.

Self-Regulation

One solution to overloading is self-regulation.

Participants in the Road Transport Management System (RTMS) are required to maintain the necessary systems to demonstrate that each of their vehicles poses minimal risk to the road infrastructure, the environment or other road users, while it must also be evident that the operator is taking care of its drivers, and is consistently transporting passengers and goods safely.

The RTMS currently encompasses 154 fleets representing almost 8 000 trucks and buses – up from the 74 vehicles certified in 2007 – operating in accordance with the prescribed SABS standard.

"Participation in the RTMS has really taken off in industries such as forestry, sugar and mining, and, more recently, the bus industry," says Nordengen.

"Incidents of speeding, accidents and overloading are down, and fuel savings up."

Source: *Engineering News*

and was not spent on road upgrades. Cesa further warned that, if e-tolling did not go ahead, planned future phases of the GFIP could be in jeopardy, leading to continued congestion and a negative impact on the economy.

Meanwhile, transport economist Barry Standish told the advisory panel that the time and cost savings of travelling on the upgraded GFIP roads far outweighed the e-toll tariffs.

GFIP project manager Alex van Niekerk added that the upgrade to Gauteng's highways had, so far, saved 81 000 vehicle hours thus far and that this would increase to 492 000 hours by 2050.

After hearing numerous submissions from various parties, the advisory panel compiled a report, which it submitted to Gauteng Premier David Makhura at the end of 2014. The Premier publicly released the findings of the report in January 2015. The panel had determined that the e-toll system was administratively cumbersome, as well as unaffordable and inequitable and that, contrary to statements by Sanral and the DoT, did place a disproportionate financial burden on low- and middle-income households.

Fuel levy not enough

Stellenbosch University transport economics lecturer Johann van Rensburg says a fuel levy is increasingly becoming a less productive income source for government in relation to road use.

He told attendees at the Southern African Transport Conference, in July 2015, that fuel levies were a diminishing revenue source for governments worldwide, as vehicles were becoming more fuel efficient and travelling more kilometres with the same amount of fuel and, thus, paying the same fuel levy.

He suggested that the fuel levy should be supplemented or replaced by a viable alternative.

Source: *Engineering News*

It did find, however, that the GFIP benefited the economy and residents of the province in terms of reduced travelling time, improved fuel efficiency and improved logistics for businesses.

Makhura told journalists in January 2015 that the report had contained more than 50 recommendations, one of which was a hybrid funding model.

This model would incorporate various revenue streams – including funding from the provincial fiscus, e-tolls – albeit at a reduced rate and reduced cap, ring-fencing a national fuel levy and recovering funds from the construction industry for the construction of the roads – and be implemented to finance debt incurred for Phase 1 of the GFIP and raise the funding needed for phases 2 and 3. The panel stressed that all funding for the first phase had to be sourced from Gauteng.

The Gauteng provincial government subsequently announced plans to work with national government, represented by Deputy President Cyril Ramaphosa, as well as the Ekurhuleni, Johannesburg and Tshwane metropolitan municipalities to consider the recommendations of the report and determine a way forward.

While those opposed to the system were hopeful that the panel's work would lead to the scrapping of e-tolls, Makhura and Finance Minister Nhlanhla Nene confirmed in February 2015 that GFIP road users would continue contributing to toll fees.

In May 2015, Ramaphosa announced a revised fee structure for the GFIP, which would result in the implementation of a single, reduced tariff for all motorists, regardless of whether or not they had registered e-tags. The single tariff for light motor vehicles will be reduced to 30c/km, from the current 58c/km, while the monthly cap will be reduced to R225, from the current R450.

Users who do not pay their toll fees within 30 days will be charged double the standard tariff, but this too will be capped at R450 a month. The changes will be implemented in phases in the coming months.

The new fee structure will result in a R390-million a year revenue shortfall for Sanral. The national and Gauteng governments will contribute funds to make up this shortfall.

Nene has revealed that Sanral already faces a revenue shortfall of R600-million to R700-million from the nonpayment of e-tolls to date. Users with outstanding e-toll fees will be given a 60% discount on the amount owed, but will have to settle those payments within six months.

Government will also, as a further measure to encourage users to pay for using the GFIP roads implement legislation to link toll payments to licence-disc renewals.

This legislation will be prepared as part of amendments to the Administrative Adjudication of Road Traffic Offences, or AARTO, Act.

Despite the lower toll fees and a lower monthly cap, criticism of the system remains, with Outa saying it remains administratively cumbersome and that road users will still not be "coerced" into paying e-tolls.

Democratic Alliance (DA) Shadow Minister of Transport Manny de Freitas said in June 2015 he would table a Private Members Bill against urban tolling, as government has failed to acknowledge public sentiment surrounding the e-tolls. A Private Members Bill allows an individual MP to submit a Bill to a Parliamentary committee to decide whether it meets certain promulgation criteria. Minister in the Presidency

Jeff Radebe highlighted in July 2015, highlighted to delegates at the Gauteng Infrastructure Investment Conference that the user-pays principle was a good mechanism for financing critical infrastructure projects, as on-budget financing was limited and off-budget financing options, such as public–private partnerships would be viable only if a correct balance was found between taxpayer and user-pay contributions. Meanwhile, other toll projects under consideration include upgrades to the N1/N2 Winelands project and the N2 Wild Coast road.

The proposed N1/N2 Winelands project would entail implementing tolling through traditional toll booths on a 105 km stretch of the N1 highway between Cape Town and Worcester, and a 70 km stretch of road on the N2 highway between Bot River and Cape Town. The proposed project, for which a record of decision was issued in 2005, was halted in May 2013, when the Western Cape High Court granted the City of Cape Town an interim interdict pending a review of Sanral's decision to implement tolls along these routes.

Collusive tendering claims

Political opposition party the Democratic Alliance (DA) requested the Parliamentary Portfolio Committee on Transport in March 2015 to urge South African National Roads Agency Limited (Sanral) CEO Nazir Alli to explain why there was a delay in pursuing legal action against 12 companies. South Africa's competition authorities found that these companies had participated in collusive tendering in the construction of various road projects, including Gauteng Freeway Improvement Project (GFIP) tenders.

After a voluntary fast-track settlement process, the Competition Commission in June 2013 fined 15 construction companies a collective R1.46-billion for participating in collusive tendering on about 140 projects valued at R47-billion. Twenty-four of the projects were awarded by Sanral, with many involving GFIP projects. The Competition Tribunal had approved the fines.

Transport Minister Dipuo Peters noted in a February 2015 Parliamentary reply to the Freedom Front Plus that the 12 companies against which Sanral could choose to pursue legal action were Haw & Inglis, Siyavaya Highway joint venture (JV), Nasweto Highway JV, Concor Holdings, Raubex, WBHO Construction, Basil Read, GFI Contractors JV, Group Five Civil Engineering, Intertoll Africa, Bouygues/Basil Read/Ubambo and Tolcon Lehumo.

Sanral has, on several occasions, said it would stand firm and pursue civil claims against the implicated companies and, in 2014, appointed an independent estimator and economist to calculate the damages the agency might have suffered as a result of the collusive practices. However, no outcome has yet been determined, with Peters stating in February 2015 that work on determining the extent of what Sanral might claim from these companies was continuing. She noted, however, that Sanral would "endeavour to recover all losses suffered from all the companies that the Competition Tribunal has found against".

"Sanral has failed to take decisive action that will see these companies brought to book . . . despite the Competition Commission's findings that the companies were involved in bid rigging on tenders relating to the GFIP.

"While the companies involved agreed to pay proposed penalties, further legal action would send a strong message to construction industry bigwigs who are complicit in the widespread collusion in the industry. These questionable actions of the companies involved must compel Minister Dipuo Peters and the Sanral CEO to take swift and decisive action," the DA said in a March 2015 statement.

The Opposition to Urban Tolling Alliance also called on Sanral, in the same month, to take further legal action, stating that while there were media reports that Sanral was pursuing civil claims and had laid criminal charges with the Hawks, the length of time that had passed since the competition authorities had made their determination was "unacceptably overdue".

Source: *Engineering News*

The City of Cape Town and Sanral have, since November 2013, been in a legal dispute over Sanral's refusal to make public the documents the agency used in its decision-making process for the project. In August 2014, the Western Cape High Court ruled against Sanral keeping the documents secret. However, the court had ordered that some information would remain restricted until the court started the review of tolling on this project. In December 2014, the Supreme Court of Appeal (SCA) granted the city leave to appeal the Western Cape High Court's order to keep the documents secret until the review got under way.

In March 2015, the SCA ruled in favour of the city, allowing it to disclose to the public details of a tender for which Protea Parkways Consortium (PPC) was selected as the preferred bidder to build and operate the N1/N2 Winelands Highway as a concessionaire.

The city subsequently revealed that the proposed tariffs for this road, at 84.95c/km, would be three times as high as the 30c/km charged for the first phase of the GFIP and that PPC was expected to earn R48-billion in toll revenue over the concession period. Further, it added that the contract with PPC included a clause that obligated Sanral, should there be any delays or the Transport Minister approve lower tariffs, to pay PPC a sum of money to ensure its revenue totalled R84-billion. City of Cape Town MMC for Transport Brett Herron noted that, as part of the contract with PPC, there would be no monthly caps on what motorists would spend on the tolls and no time-of-day discounts. The city did not believe the project would benefit road users, stating that the toll tariffs would exceed any road-user benefits. It added that the affordability for low-income groups was not taken into account, while no consideration was given to the macroeconomic impact of the toll fees, highlighting that the transport of agricultural goods, in particular, would be negatively impacted.

Cape Chamber of Commerce and Industry transport portfolio committee chairperson Peter Hugo questioned how the cost of this project had increased from an estimated R10-billion when the project was awarded to PPC in 2011, to R48-billion. The chamber was also concerned about the contract possibly containing provisions for yearly toll tariff increases.

In April 2015, Sanral CEO Nazir Alli said in response to various media reports on the proposed project that the toll tariffs for the project had not been set and that tariffs could be determined only by the Transport Minister. He said claims that PPC would benefit from estimated profits of R48-billion were "simply not true". He also argued that the project would greatly benefit the Western Cape economy through the improved flow of the transportation of people and freight, further adding that the highways around Cape Town needed "urgent attention".

The Western Cape High Court will hear the city's review application in August 2015. Another highly contested proposed toll project under consideration by Sanral is the N2 Wild Coast toll project, which was initially meant to stretch from East London, in the Eastern Cape, to Durban, in KwaZulu-Natal. Following strong opposition to the project in KwaZulu-Natal, Sanral said it would focus on the road infrastructure only in the Eastern Cape.

In March 2015, allegations emerged that Sanral had fraudulently submitted affidavits from Wild Coast residents – expressing their support for the proposed project and denying that they had authorised law firms to submit a court application to overturn a decision to authorise construction of the project – in court during 2014. Sanral spokesperson Vusi Mona said the roads agency was investigating the circumstances surrounding the allegations of fraud.

Chairperson of the the Presidential Infrastructure Coordinating Committee and Land Reform Minister Gugile Nkwinti in July 2015 announced that construction on the road project could start in September 2016 but noted that the project start date could also be delayed to 2017 if current legal processes continued. Further, there was also uncertaintly about whether motorists from Durban would be required to provide the lion's share of funding for the project.

Road projects

Several road maintenance and development projects are being implemented by Sanral, its concessionaires and provincial government departments.

The Bakwena Platinum Corridor Concessionaire plans to spend more than R5-billion on upgrading the sections of the N1 and N4 under its jurisdiction over the next 15 years. For the 2015/16 financial year, R110-million has been set aside for upgrades and rehabilitation work on the N1, including the upgrade of the Zambezi interchange into a diverging diamond interchange by November 2015.

The R275-million rehabilitation project, in Limpopo, of the N1 from Pienaarsrivier to the Bela Bela interchange was, meanwhile, expected to be completed by June 2015.

Bakwena will invest a further R149-million in upgrades to the N4 in 2015/16, with rehabilitation work on a 20 km stretch of road from Zeerust to Groot Marico, in the North West, set to continue. Bakwena will also start resealing the N4, from the Helen Joseph interchange to the Marikana interchange, and from the Brits interchange to Soshanguve. An additional carriageway between Bapong and the Marikana interchange will also be added. The construction of four reversible lanes that are expected to add 28% more capacity to the N4 route, will be completed in May 2016.

Another Sanral concessionaire, Trans African Concessions, or TRAC, is upgrading the N4 toll road between the N11/Hendrina interchange, in Middelburg, Mpumalanga, and Wonderfontein. The project, which is being undertaken in two phases – section 4C, from the Hendrina interchange to Woestalleen, and section 4D, from Woestalleen to Wonderfontein – will be completed by October 2016. The project involves the construction of a divided highway, with the existing westbound carriageway to be upgraded to a three-lane highway and a two-lane eastbound carriageway to be built.

N3 Toll Concession (N3TC), meanwhile, has announced plans to invest about R1-billion in upgrades to sections of the N3 between Gauteng and KwaZulu-Natal over the next three years. A R444-million project to rehabilitate the left, or truck, lane and lay a new asphalt pavement from Mooi River to Estcourt will be completed towards the end of 2015. Further, a 60 km section of the road from Harrismith to Warden, in the Free State, will be rebuilt, including the laying of a new asphalt pavement, at a cost of R413-million. The project started in January 2015 and will be completed by April 2017.

A third contract, valued at R400-million, will involve adding one additional traffic lane in each direction of the 14 km stretch of the N3 between Cedara and Tweedie, in KwaZulu-Natal. The project is expected to get under way in August 2015 and be completed within 24 months.

Meanwhile, in February 2015, Sanral highlighted the benefits of the proposed R5.3-billion De Beers Expressway, which will be built and operated by N3TC. The proposed project entails the construction of a 99 km dual carriageway from Keeversfontein, in KwaZulu-Natal, to Warden, in the Free State. It will be 15 km shorter than the existing N3 Van Reenen's Pass route and offer flatter grades, a smoother alignment and fewer sharp curves. Sanral indicates that using the new route will shorten driving time for light-vehicle drivers by 30 minutes and for heavy-vehicle drivers by 60 minutes. It is also expected to reduce congestion on the Van Reenen's Pass route. Sanral will continue to maintain the R103/N3 past Harrismith and across van Reenen's Pass, with the roads agency expecting one-third of the current through traffic to continue on the existing route.

The construction of the De Beers Expressway forms part of plans to develop a Durban–Free State–Gauteng logistics and industrial corridor, with Sanral saying that the new route, which will take four years to complete, will contribute R4.4-billion a year towards South Africa's gross domestic product. Sanral is, meanwhile, investing more than R1.66-billion on current upgrades on the N7, in the Western Cape, including the construction of a dual carriageway to Malmesbury and several new interchanges. The project will be completed in February 2016.

Meanwhile, a R637-million project to rehabilitate a 52 km stretch of the R23 between Standerton and Greylingstad, in Mpumalanga, will be completed by the end of this year. The project, which falls under Sanral's jurisdiction, includes reconstruction of the road and adding additional pavement layers and lanes.

In the North West, Murray & Roberts Infrastructure is undertaking the upgrade of two gravel roads in Ganyesa, near Vryburg, to a surface standard. The project will include the upgrade of 58.4 km of road and will be completed by May 2016.

The City of Cape Town is also undertaking the R20-million upgrade of Camps Bay drive, which has not been refurbished in 30 years. The road will be widened by 1.4 m on the Table Mountain side between Geneva drive and Rontree avenue, while the road surface will be improved by replacing the top surface with recycled material and asphalt. Certain sharp corners will be slackened to make it easier for buses to travel on the road, while a damaged culvert on Victoria road

Sanral is investing in several road maintenance and development projects

Picture by Duane Daws

will be replaced. The project started in April 2015 and will be completed in November 2015. The city also started work on a R24-million project to rehabilitate the Strand and Adderley street intersection, in Cape Town, in April 2015. The existing asphalt surfacing at the intersection is about 30 years old and is cracked, resulting in water leaking through the road surface, onto the concourse deck and into a pedestrian and retail space below. The rehabilitation will entail the removal of the existing asphalt, the waterproofing of the concourse and the resurfacing of the road with a new asphalt layer. The project will be completed in August 2015.

The Gauteng Department of Roads and Transport awarded the tender for the upgrade of a portion of Cedar road, in Johannesburg, in April 2015, the first tender under the province's open tender process pilot programme. Twelve construction firms had submitted bids for the tender by January 20, whereafter the tender box was opened in public. The bids, ranging from R70-million to R100-million, were registered and imprinted and the contract prices announced to the public. The Gauteng Department of Roads and Transport's Bid Evaluation Committee evaluated each bid and each bidder's ability to meet the requirements of the tender and, in an adjudication process open to the public on April 1, gave its recommendation to the Bid Adjudication Committee (BAC). The BAC, on the same day, agreed with the BEC's findings that Power Construction, which had submitted a R96-million bid, was the most suitable bidder.

Freight transport by road

Although the South African government is continuing its efforts to move more freight onto rail, the majority of freight in the country is still transported by road. The tenth annual State of Logistics Survey, a collaboration between the Council for Scientific and Industrial Research, Imperial Logistics and Stellenbosch University, outlines that 1.53-billion tons, or 88.3%, of all freight was moved by road in 2012, with the balance of 203-million tons moved by rail.

Despite the transportation of freight by rail having increased somewhat from 11.4% of overall freight transport in 2011 to 11.7% in 2012 – with estimates indicating a further increase to 12.1% in 2013 – the survey points out that there has been little change in the percentage of goods moved by rail transport corridors.

The survey further outlines that there is consensus among the public and private sectors in South Africa that more rail-friendly freight must be moved back onto rail to reduce logistics costs, damage to roads and congestion, as well as improve the country's competitiveness.

As part of measures to attract freight back to rail, State-owned Transnet initiated a R300-billion – now R312-billion – seven-year Market Demand Strategy (MDS) in 2012 to improve its rail, port and pipeline infrastructure. About R200-billion will be spent on improving the country's rail infrastructure, with rail volumes expected to increase from 200-million tonnes to 350-million tonnes. The State-owned entity states that moving more freight onto rail will reduce transport costs and lead to less congestion and carbon emissions while mitigating further deterioration of South Africa's secondary roads.

However, investment in rail infrastructure and the improvement in rail services alone will not be sufficient to deal with the road-to-rail modal shift issues. The authors of the tenth annual State of the Logistics Survey state that, to improve the freight transportation sector, Transnet, logistics service providers, road hauliers and other private-sector role-players need to work together to ensure that the country's rail and road infrastructure, as well as inland terminals and ports, complement each other, as integrating road and rail solutions will be less costly than using either mode on its own.

Meanwhile, the survey also highlights that externality costs, which the public incurs as a result of the transport of freight by road, amounted to R40-billion in 2012. The biggest cost, R15-billion, pertained to road accidents involving freight vehicles.

The deaths of South Africa's Public Service and Administration Minister Collins Chabane and two bodyguards in March 2015 have highlighted the need for greater attention to the safety risks of the road freight transportation sector.

The Minister and his bodyguards were killed when a truck driver allegedly made an illegal U-turn on the N1, near Polokwane, in Limpopo, turning in front of the vehicle in which the deceased were travelling.

Opposition political party the Congress of the People has subsequently called on government to review the road freight system in South Africa.

Several serious accidents involving trucks also grabbed public attention during 2014. In October 2014, two people were killed and 54 injured (three of them critically) on the N12 East, near Alberton, when a truck driver failed to stop as the pace at which morning peak-hour traffic was moving slowed to a crawl. Two trucks and 45 cars were involved in the pile-up, with the road closed for hours. The driver of the truck told police that the brakes had failed. In the same month, four people were killed and 14 were injured in two accidents on the N3 at Van Reenen's Pass when a truck lost control and crashed into other vehicles.

Meanwhile, the Road Traffic Management Corporation (RTMC) states that more than 433 000 drivers in South Africa are operating without valid professional driving permits (PrDPs). Figures show that about 43% of all PrDPs issued in the country had expired as at December 31, 2014. To improve safety on the country's roads, the RTMC plans to undertake unannounced inspections of transport operators' premises to establish compliance levels. Further, it plans to identify and take action against those habitually overloading vehicles.

Another significant concern for the South African road freight industry is the increasing number of truck hijackings. Road Freight Association (RFA) technical and operations manager Gavin Kelly told Engineering News in December 2014 that truck hijackings had been steadily increasing. Official crime statistics indicate that truck hijackings have increased from 821 in 2011/12 to 943 in 2012/13 and to 991 in 2013/14. Kelly estimated that such incidents would result in R1.2-billion of losses for the road freight industry in 2014/15.

He explained that trucks were hijacked mainly for three reasons. Most commonly, trucks are hijacked for the goods they carry, such as fuel, cigarettes, electronic goods or food. They are also hijacked and the trailer sold and thirdly, trucks are hijacked, dismantled and their components sold.

In response to truck hijackings increasing, the RFA and the South African Police Service have formed a task team to investigate the hijacking of trucks transporting fuel, with findings showing that insiders are involved in about 70% of incidents. The RFA is encouraging transport operators to continue promptly reporting hijackings.

Passenger transport by road

The minibus taxi industry

According to the South African National Taxi Council, the South African taxi industry transports about 15-million commuters a day using 180 000 taxis. The taxis cover about 78-million kilometres a day, spend about R15-billion a year on fuel, R600-million on tyres, R110-million on lubricants, R2-billion on insurance and R7-billion on salaries.

Further, the National Household Travel Survey (NHTS) 2013, conducted by Stats South Africa (Stats SA) and released in July 2014, indicates that the percentage of households that use taxis increased to 69% in 2013. From 2003, when the last NHTS was conducted, to 2013, all provinces noted an increase in the percentage of households that use taxis. In KwaZulu-Natal and Limpopo, the increases were as high as 15 and 16 percentage points respectively. Stats SA further indicates that the greatest increase in using taxis had been in rural areas, rather than in urban and metropolitan areas. Commuters used taxis the most in KwaZulu-Natal, Mpumalanga and Limpopo, with figures the lowest in the Northern Cape and the Western Cape.

Respondents to the NHTS 2013 were most often dissatisfied with the state of facilities at taxi ranks and the high cost of using taxis, while commuters were also concerned about safety in terms of accidents and the roadworthiness of taxis.

Violence between rival taxi organisations is another concern, with seven people shot dead in a spate of violence in February 2015.

In March 2015, Gauteng Roads and Transport Department head Ronald Swartz and chief director Bonga Majola told a Portfolio Committee on Roads and Transport inquiry on taxi permits and licensing that department officials were colluding with police and taxi operators on issuing fake licences in return for bribes. This, they said, contributed to the violence in Gauteng's taxi industry, owing to the increase in illegal taxi operators encroaching on the routes of legal taxi operators. Majola noted, however, that no officials had yet been charged, stating that the department lacked the powers to arrest and prosecute officials.

Meanwhile, the Mpumalanga MEC for Public Works, Roads and Transport Dumisile Nhlengethwa in March 2015 warned taxi associations that he would suspend all taxi services in and around the Mbombela municipality amid ongoing violence between operators at the Mbombela taxi rank. The MEC further appointed a task team to review the issues pertaining to the routes and operating licences in the area. The task team is expected to table a report to the MEC by June 2015.

Strikes by taxi drivers also negatively affect commuters, preventing them from travelling to and from school and work.

The Taxi Recapitalisation Programme (TRP), implemented in 2006, has not garnered the expected results and is regarded by many as a failure. The TRP aimed to renew the ageing and often unsafe fleet of taxis operating in the country, improve road safety, as well as formalise and regulate the taxi industry.

Transport Minister Dipuo Peters' response in an August 2014 Parliamentary reply to a question from DA MP Christian Hunsinger was that, since the start of the TRP in October 2006, 59 029 taxis had been scrapped. The majority of the scrapped vehicles (13 235) were from Gauteng, followed by 7 270 from Mpumalanga and 7 091 from Limpopo, 7 060 from the Eastern Cape, 6 874 from the North West, 6 482 from KwaZulu-Natal, 5 646 from the Western Cape, 4 712 from the Free State and 659 from the Northern Cape.

The Minister suggested at the time that a further 7 500 taxis would be scrapped in the 2014/15 financial year. The Parliamentary Portfolio Committee on Transport had also, in July 2014, asked the Minister and the DoT for more clarity on the TRP and how its success was being monitored.

There is a widespread perception that corruption affects the administration of the TRP, seeing taxis officially earmarked for scrapping being transferred to operate in other jurisdictions rather than being retired from the fleet.

An indication of the failure of the programme was evident in Finance Minister Nhlanhla Nene's 2015 Budget, where he outlined that over the Medium-Term Expenditure Framework (MTEF) period from 2015/16 to 2017/18, R1.1-billion would be reprioritised from the TRP and other road budgets for the upgrade of the R573 Moloto road, in Mpumalanga, to improve road safety.

The committee also questioned whether the department was working with the Department of Labour to eliminate the exploitation of taxi drivers by taxi owners.

The committee further suggested that the Minister and the DoT consider the provision of subsidies for the taxi and bus industries.

The taxi industry is also being included in broader transport plans in various cities across South Africa, with taxi drivers joining bus operating companies for the various BRT systems that are being developed.

The commuter bus industry

According to the South African Bus Operators Association (Saboa), about 25 000 buses are operating in the country, with 18 000 of these being used for public transport, and the remainder by industry and government for in-house purposes.

The country's commuter buses have an estimated replacement value of R25-billion and travel about 1.02-billion kilometres a year while undertaking about 816-million passenger trips.

Along with other developing countries, South Africa, in addition to providing traditional bus services, is rapidly expanding its bus rapid transit (BRT) networks. The Institute for Transportation and Development Policy highlighted in a November 2014 press release that BRT systems globally had expanded by 383% over the past decade, with 75% of all BRT kilometres built having been rolled out in developing countries such as China, Brazil and Indonesia. South Africa has added 70 km of BRT infrastructure in the ten years to November 2014.

Government has set a goal to ensure that most city residents live within 500 m of a BRT station by 2020. BRT systems use dedicated bus lanes and stations to transport a high volume of passengers in and around cities.

Four BRT systems have been launched in South Africa – the Rea Vaya, in Johannesburg; MyCiTi, in Cape Town; A Re Yeng, in Tshwane; and Yarona, in Rustenburg.

The City of Johannesburg, which started construction on the Rea Vaya system in 2007, has completed the roll-out of Phase 1A and Phase 1B and work has started on Phase 1C. Phase 1A, which covers 325 km of dedicated lanes, serves the Johannesburg inner city, including the central business district (CBD), Hillbrow and Braamfontein, while Phase 1B, which started operating in February 2014, offers services between Noordgesig, in Soweto, to the Johannesburg CBD.

Phase 1C, which will comprise 16 km of trunk routes, three complementary and two feeder routes, and ten stations, will run from Parktown to Alexandra and then to Sandton. It is expected that 69 articulated buses and 171 standard buses will operate along this route. The Johannesburg Development Agency (JDA), which is facilitating the construction of this phase on behalf of Rea Vaya, expects Phase 1C to be completed by October 2016. By February 2015, construction work along Katherine street, in Sandton, was at an advanced stage.

Phase 1C will include an underground public transport interchange at the Wynberg bridge, and will be combined with a R130-million walking and cycling bridge over the M1, connecting Alexandra and the

As many as 35 000 people use the City of Johannesburg's Rea Vaya system

Picture by Duane Daws

Sandton CBD to create a "Corridor of Freedom" between these two areas. Construction on the bridge, which forms part of a 5 km pedestrian and cycling path, started on March 1, 2015, and will be completed by October 2016.

The City of Johannesburg might also extend the Phase 1C service from Sandton to Randburg by 2018. This phase is expected to eventually connect the north-east quadrant of Johannesburg, from the CBD to Alexandra, Sandton, Randburg, Greenstone, Ivory Park, Rabie Ridge and Midrand.

Although as many as 35 000 people use the Rea Vaya buses along the Phase 1A and 1B routes every day, passenger volumes fall short of the 42 000 and 60 000 passengers a day that are expected to be transported along Phase 1A and Phase 1B respectively.

Further, in February 2015, some bus drivers working for Piotrans – the Rea Vaya bus operating company – absconded from work and left buses stranded in Johannesburg. Piotrans initiated disciplinary hearings against the drivers. In late February, 158 drivers were found guilty of serious misconduct, including sabotage, and were subsequently fired. Only 65 bus drivers remained in the employ of Piotrans, which started a recruitment process for new drivers. All Rea Vaya services were later suspended, but following the training of 65 new drivers, operations on 38% of routes resumed on March 19, 2015. Piotrans indicated that the full service would resume only by mid-April 2015, as more than 200 bus drivers were required to ensure the optimal operation of all routes.

Piotrans pointed out that the strike by drivers cost it R25.2-million.

To improve working conditions for the Rea Vaya bus drivers, a R20-million layover facility is being built on the Pat Mbatha highway, in Booysens, where drivers will be able to rest and eat in between their shifts. The facility, on which construction started in October 2014 and which will accommodate up to 140 buses on 2 ha, is also expected to result in lower fuel consumption, as drivers will not need to return to the depot in between shifts. Construction of the facility is due for completion by October 2015.

Meanwhile, the MyCiTi BRT system, in Cape Town, is exceeding expectations, with 7.4-million passenger journeys recorded from July 1, 2013, to June 30, 2014 – 2.1-million more than what transport authority Transport for Cape Town (TCT) had targeted.

MMC for Transport Brett Herron said in a September 2014 statement that demand for the MyCiTi BRT services continued to grow, with the number of monthly passenger journeys having reached 1.39-million by October 2014. He attributed this increase to the continued expansion of the service, noting that the number of kilometres of MyCiTi services had increased from 308 000 km a month in October 2013 to 1.27-million kilometres a month in August 2014.

"It is clear from these statistics that, as the service expands . . . more residents rely on the MyCiTi buses to travel around the city, be it to get to work, school or elsewhere," said Herron. To ensure the sustainability and financial viability of the MyCiTi system, TCT in 2014 undertook an optimisation study to ensure that the MyCiTi services met passenger demand. The study revealed some shortcomings and, from October 2014 to early this year, TCT introduced route and timetable changes to better satisfy demand. The changes will include an increase in the number of bus trips on the busiest routes during peak periods to alleviate waiting times. Fewer buses will run on quieter routes during peak and offpeak times to match lower passenger demand.

MyCiti cost structure

The fare-revenue-to-cost ratio of the MyCiti system improved from 30% in 2013/14 to 40% in 2014/15, meaning that fares covered 40% of direct vehicle operating costs. This ratio is expected to increase further to 53% in 2015/16, but will remain well below the targeted 85%.

To further improve the fare-revenue-to-cost ratio for the system, fare revenue and ridership numbers will have to increase, along with system efficiencies, while vehicle operating costs will have to decrease.

Consulting engineering firm Gibb, which provides operational support for the MyCiti system, has suggested several ways to improve the fare-revenue-to-cost ratio, including that the system use 9-m-long buses, instead of 6-m-long, buses; the length of corridors be limited; and that the service not be operated after 21:00, when ridership is low.

Source: *Engineering News*

TCT further plans to introduce an express service on the T01 trunk route, providing a direct link between the Wood, Table View and Civic Centre stations, without buses stopping at in-between stations. About 2 000 passengers use this trunk route service during the morning peak period.

This is expected to cut between seven and ten minutes from commuters' travel during peak periods. Further, pending the delivery of additional buses, TCT aims to start operating the T02 trunk route between the stations of Atlantis, Table View and Civic Centre in the first half of this year. The N2 Express service provides bus transport from Khayelitsha and Mitchells Plain to the Cape Town CBD.

Meanwhile, TCT had cancelled services on one route, along Ocean View drive, owing to low passenger demand and reduced the number of MyCiTi kiosks where there was low demand. The route cancellation is expected to result in cost savings of R2.1-million a year, while the closure of the kiosks is expected to add costs savings of R2.2-million a year.

As a further means to improve the passenger experience, MyCiTi introduced single-trip tickets in October 2014 for those wishing to use the MyCiTi

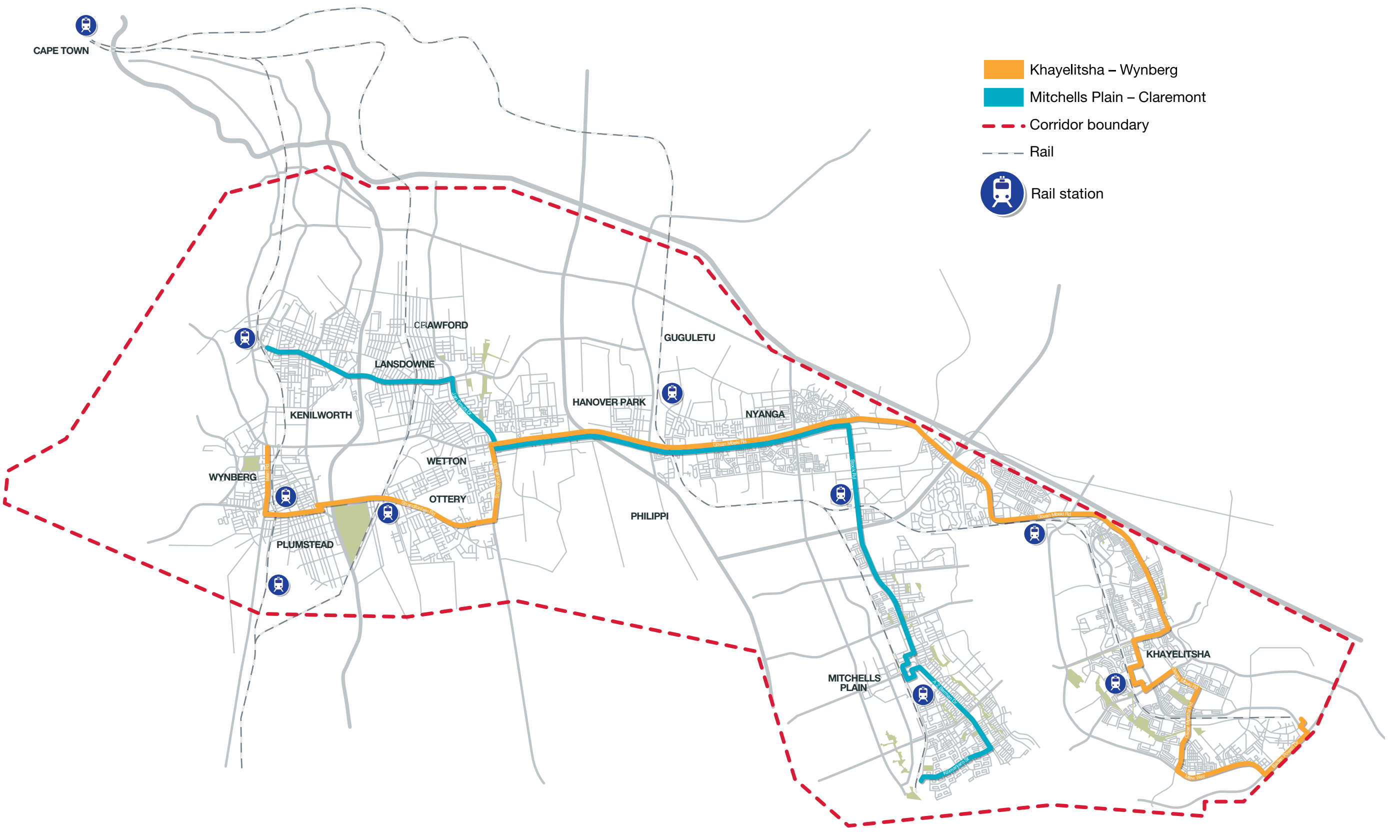
MyCiTi service levels

To ensure that vehicle operating companies (VOCs) that operate the MyCiTi bus service uphold prescribed service levels, the City of Cape Town had, from January 1 to June 30, 2014, issued up to 200 fines valued at a collective R198 000 to the VOCs in relation to schedule adherence, employee conduct and compliance concerns, besides others.

Further, 15 bus drivers had also been dismissed between January 1 and August 6, 2014, for various reasons, including gross negligence, absenteeism, accidents and misconducts, besides others.

Source: *MyCiTi*

My Citi Phase 2 map



Source: MyCiTi Phase 2 Map

bus service only once. The tickets allow for one journey, including transfers at stops and stations. More than 3 000 of these tickets had been sold from October 18 to the end of November 2014.

In July 2014, MyCiTi also introduced the Table Mountain service, providing public transport for tourists and residents to Table Mountain and the surrounding area. Despite the gains made, the system is not without its challenges. Similar to other BRT systems, bus drivers, who are contracted through vehicle operating companies, embark on strike action, bringing transport to a halt on certain routes. The most recent MyCiTi bus driver strikes took place in October 2014 and on January 15, 2015, but were resolved fairly quickly.

Ridership numbers for this phase are expected to be four times that of Phase 1, with TCT estimating that 7 600 passengers travelling from the south-east towards Wynberg and Claremont will use the service during the morning peak period. Passenger numbers are expected to increase to up to 14 000 along the interconnected portion of the corridor along Govan Mbeki road.

Herron stated in November 2014 that the development of the Lansdowne/Wetton corridor would improve inclusivity and connectivity, and provide a better quality of life for residents, pointing out that more than 1.4-million people lived in the south-east and southern quadrant of Cape Town. Residents of Mitchells Plain and Khayelitsha travelled at least 20 km to work every day. Commuters, therefore, spend many hours in traffic, with the congestion on primary and secondary roads also being a concern.

Overall, TCT expects services to continue expanding across Cape Town over the next 20 years. The latest BRT system to start operations is the 80 km R2.6-billion Tshwane Rapid Transit (TRT), or A Re Yeng, which launched its Phase 1A operations, extending from the Pretoria CBD to Hatfield, in November 2014. Phase 1A is a 7 km route, with buses stopping at seven stations, including at the Loftus Versfeld sports stadium.

The TRT recorded its highest number of passenger trips to date – 54 527 in February 2015. The City of Tshwane is planning to run a marketing campaign to entice the public, including school learners and university students, to use the service.

Transport Minister Dipuo Peters said in April 2015 that construction on the 7 km Line 2B, between Hatfield and Menlyn, would start in August, while construction on the 11 km Line 2C, between Menlyn and Denneboom, in Mamelodi, would start in November.

A Re Yeng will eventually include 62 stations.

In November 2014, the Development Bank of Southern Africa extended a R488-million loan to TRT to partly fund the R800-million in capital needed to buy 171 buses for the A Re Yeng BRT service. TRT will use 18 m articulated buses capable of transporting between 90 and 120 passengers and 12 m standard buses capable of transporting between 65 and 75 passengers. A portion of the A Re Yeng bus fleet will run on compressed natural gas.

Meanwhile, in Rustenburg, in the North West, work is under way on the R7-billion Yarona BRT system. The first phase of the system, which was previously called the Rustenburg Rapid Transport system, will start operations in 2016. The overall system, to be completed in phases until 2022, will comprise two BRT trunk corridors and feeder services that will provide transport for about 200 000 commuters a day.

Other cities like Durban, in KwaZulu-Natal, and Ekurhuleni, in Gauteng, have broadened the scope of their transport systems and are developing integrated rapid public transport networks (IRPTNs) that will include various transport options, including bus and rail.

The eThekwini municipality has started construction on its GO!Durban IRTPN, which will be rolled out in four main phases up to 2030, by which time the city will have an interlinked transport network comprising roads, rail and bus lines that connect the different parts of the city. Nonmotorised transport facilities are also being incorporated into the network.

The municipality expects the first corridor – C3 – of the first phase of GO!Durban to be operational by 2016. This corridor will link Bridge City, KwaMashu and Pinetown. Five major tenders valued at a collective R2.2-billion were awarded during 2014. Construction work on the Inanda road/MR577 intersection portion of C3 started in May 2014.

Group Five and PANDEV Joint Venture Construction have been appointed to build another 4.5 km section of

C3 from just west of the Umgeni viaduct on the MR577 to the Inanda road intersection.

The scope of work includes the construction of the MR577/Newlands Expressway interchange, where work started in February 2015. A temporary traffic management centre (TMC) will be established in 2016 to support the C3 operations, while a contract to build a permanent TMC will be awarded during 2015.

The Ekurhuleni metropolitan municipality is, meanwhile, developing its IRPTN, which will connect nine towns on Gauteng's East Rand through existing and new bus services, revitalised rail networks, minibus taxi routes, cycling paths and pedestrian walkways. Construction will initially focus on three phases – from Tembisa to OR Tambo International Airport, then to Boksburg, and Vosloorus. The municipality's IRPTN will eventually include a BRT system comprising fleets of large buses, as well as minibus taxis.

While many have welcomed the investment in BRT and IRPTN systems, bus operator Putco, in March 2015, said government funding was increasingly being directed towards such systems, to the detriment of traditional bus services. *Engineering News* quoted Putco executive director Thys Heyns as saying that conventional bus services had been "neglected and strangled". He explained that bus operators and government had, during the late 1990s, signed interim bus transport contracts that were meant to be replaced with longer-term tender contracts after 12 to 18 months, but that the interim contracts had only been extended and not replaced by longer-term contracts. This, he said, had resulted in old and outdated contracts that were no longer financially sustainable.

Further, the 2009 introduction of the Division of Revenue Act had also resulted in negative consequences for the bus industry, as bus subsidy escalation formulas were not adhered to, resulting in subsidies not having increased in line with higher fuel and labour costs. Heyns pointed out that, since 2009, the revenue of a typical bus operator had increased by 30% and its expenses by about 50%, while subsidies had increased by only about 13%. This has led to cash-flow and profitability issues for several bus operators.

In February 2015, Putco informed the Gauteng provincial government that it would not renew its contracts on three loss-making routes in Gauteng, a decision that would impact about 25 000 commuters and 400 to 500 bus drivers. This prompted the provincial government to establish a task team, which would include representatives of Saboa and Gauteng municipalities, to review the structure of contracts with bus operators.

Putco competitor Metrobus has, meanwhile, started negotiations with the City of Johannesburg to receive a subsidy based on the number of passengers transported or kilometres travelled, rather than the yearly grant of about R300-million it currently receives. To administer the system, all passengers will be expected to pay for the bus services in advance through a ticket system, as opposed to the option of paying cash when boarding a bus.

Metrobus, which registers about 12-million kilometres transporting about ten-million passengers a year, will invest R500-million in 150 new buses to replace a portion of its ageing bus fleet, which comprises about 412 buses, 270 of which are older than ten years and some as old as 26 years. Metrobus stated in May 2015 that buses should ideally be replaced after 10 to 12 years.

Further, the bus operator was planning to optimise its routes by ceasing operations on routes where it competed with the Rea Vaya and establishing feeder routes in areas where passenger numbers were low. It was also considering the potential establishment of routes in underserviced areas, including Midrand, Ivory Park and Diepsloot.

Road safety

South Africa has one of the worst road safety records in the world, and road accidents are estimated to cost the South African economy R306-billion a year. The South African Road Federation (SARF) reports that about 43 people die on the country's roads every day and that the country has the second-highest road accident fatality rate per 100 000 people in Africa.

Thousands of people die every year during one of the busiest periods on the country's roads – the December/January festive season. There were 1 118 fatal crashes, resulting in the death of 1 368 people during the 2014/15 festive season and, although these numbers were 2.5% and 0.6% lower respectively than for the prior festive season, the number of fatalities remain high. The RTMC said in a March 2015 statement that 650 people had died on the country's roads in February 2015. Of the 578 fatal crashes reported for that month, 128 occurred in Gauteng, resulting in the death of 136 people, while 102 people died in 94 fatal crashes in KwaZulu-Natal. The Northern Cape had the lowest number of fatal crashes – 14 – resulting in the death of 20 people.

The SARF attributes 70% of all accidents to human behavioural factors and a further 20% to poor vehicle condition. Then Government Communication and Information System acting CEO Phumla Williams agrees that irresponsible driving is one of the main reasons for fatalities on South Africa's roads, stating that more than 90% of accidents are the result of drivers violating traffic regulations.

A national survey conducted by the Recycling and Economic Development Initiative of South Africa found that 46% of the 1 000 motorists surveyed checked the alignment and balance of their vehicle's tyres only when having new ones fitted and rarely thereafter. Tyre maintenance formed an important part of overall vehicle maintenance and ensuring the roadworthiness of vehicles. At the launch of the DoT's Easter road safety campaign, in March 2015, Minister Dipuo Peters reiterated government's commitment to reducing fatalities on the country's roads by having traffic authorities stop and check one-million vehicles a month to ensure the roadworthiness of vehicles and that drivers had valid licences and were capable of driving vehicles.

She further outlined that a Road Safety Advisory Council, which would advise government on interventions to assist in reducing fatal accidents, had been established and would be officially launched during 2015.

The SARF supports the establishment of the advisory council, but says further interventions are required to improve road safety. It has, therefore, called on government to ensure that the public has a thorough understanding of the causes of road accidents, as well as how to prevent them.

The federation further argues that the DoT, in collaboration with other parties, needs to develop a standardised road traffic accident reporting system, as reliable data is needed to ensure that authorities understand the problems before solutions can be sought. It also urges government to ensure that adequate resources are invested in improving road safety and that safe road infrastructure, including the upgrade of roadside safety barriers, bridge railings and road signs, is in place.

Picture by Duane Daws

Rail infrastructure in South Africa

Freight transport by rail

South Africa has the eleventh-largest rail network in the world in terms of route kilometres, but ranks eighth in the world in terms of total freight transported. The total network comprises 30 400 track kilometres and 20 953 route kilometres, providing good coverage for most of the country in terms of freight demand. A core network of 12 801 route kilometres – comprising 18 individual sections across five larger systems – is complemented by about 7 300 km of branch lines that allow for the extension of services to areas that are not near the main corridors.

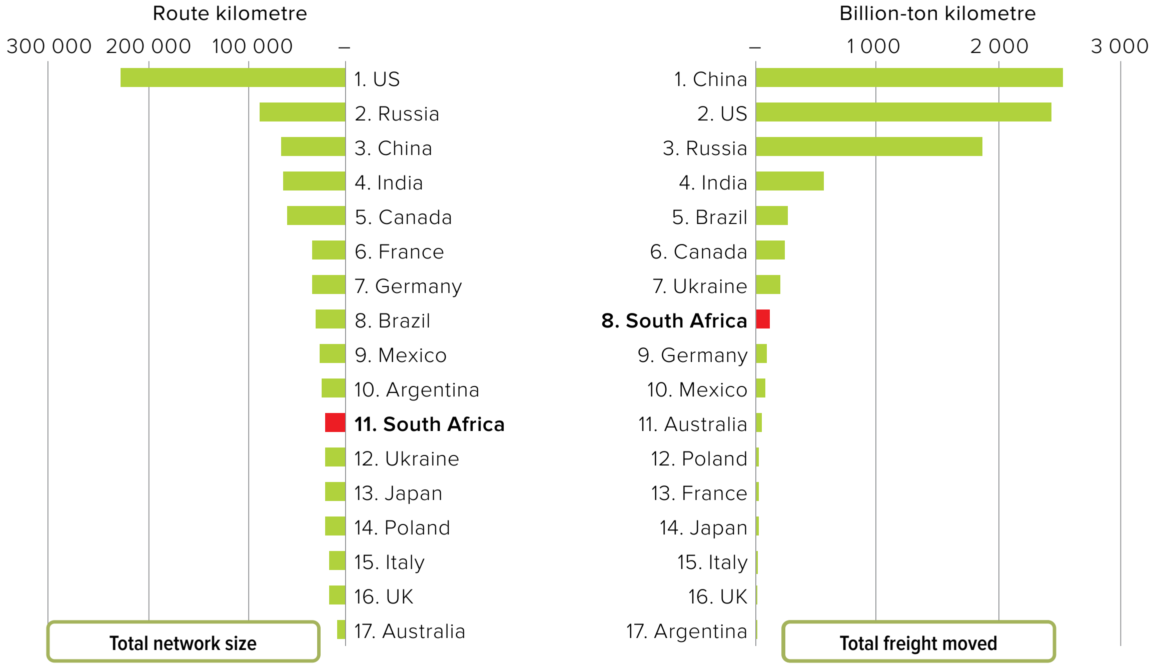
The first of the five core systems is the Gauteng to Durban system that is mainly used to transport containers, domestic coal, fuel and other general freight using light to medium trains.

The North-eastern system, which also uses light to medium trains, primarily transports agricultural products and fuel. The transportation of coal, magnetite and other minerals from Limpopo is expected to lead to higher freight volumes on this system in the future.

The Gauteng to Cape Town system, using mostly light to medium trains, links Gauteng, the Western Cape and the Free State, and is primarily used to transport containers, domestic coal to Saldanha Bay and other general freight. Some containers and automotive traffic are transported on part of this rail system.

The coal system, which is used to transport domestic and export coal, as well as domestic iron-ore to local steel plants, includes domestic feeder lines from Mpumalanga and Limpopo to Richards Bay, in KwaZulu-Natal, and to the international market through

Top global rail networks



Source: Rail development plan

Cabinet approves rail policy green paper

Cabinet approved the release of the Green Paper on National Rail Policy for public consultation in mid-August.

The Green Paper tackles issues in the local freight and passenger rail transportation industry.

The policy, which is aligned to the work of the Presidential Infrastructure Coordinating Commission, will contribute to the revitalisation of the railway industry through strategic investment-led policy interventions aligned to the National Development Plan.

The aim is to create an efficient transport system that will compete locally and internationally, while reducing transportation costs and encouraging the use of appropriate technologies to increase productivity and the acquisition of much-needed skills in the economy.

It is also aimed at improving rural access, increased mobility and job creation.

In February 2012, then Transport Minister Sibusiso Ndebele said the policy would cover freight and long-distance passenger and commuter rail services, while focusing on investment and the introduction of modern technology. The policy would also look at viable proposals for investment to restore "rail to its rightful place in our country's economy".

Source: *Engineering News*

Maputo, in Mozambique, and potentially also the rail link to Swaziland. Medium to heavy trains are used for this service.

Lastly, the export ore system, which uses predominantly heavy trains, carries export iron-ore to Saldanha Bay, domestic iron-ore to local steel plants and export manganese ore to the Ngqura and Port Elizabeth ports.

Transnet Freight Rail (TFR), the largest operating entity of the State-owned Transnet group, transports freight by rail in South Africa. TFR had transported 210.42-million tons of freight in the financial year ended March 2014, with higher automotive and container volumes, but lower coal and iron-ore volumes. This was higher than the 207.72-million tons in the prior financial year, but below the 229.72-million tons that had been targeted for the year, owing to muted economic growth, labour unrest, inclement weather, customer operational issues and depressed commodity prices.

Although TFR had expected to transport 228.35-million tons in the 2015 financial year, total rail volumes for the 2015 financial year reached only 226.6-million tons. Increased rail volumes were recorded for coal, iron-ore and manganese, containers and automotive and mineral mining and chrome, while decreases were recorded in the volumes of steel and cement and agricultural products transported by rail.

Transnet, which is working to attract more rail-friendly freight back onto the rail network, expects rail volumes to increase to 343.9-million tons by 2021, and is investing significantly in infrastructure and rolling stocks to meet that demand. Under the group's seven-year Market Demand Strategy (MDS), it plans to invest R336.6-billion to increase volumes across its rail, port and pipeline operations.

Groupwide capital expenditure (capex) for the 2015 financial year reached R33.57-billion, with R14.5-billion used to extend capacity and R19.1-billion on maintaining existing capacity. Of the overall capex, 74% was invested in the rail operations.

Transnet management changes

Transnet CEO Brian Molefe was, in April 2015, seconded to serve as acting CEO of South Africa's State-owned power utility Eskom. Although this had initially been only for a three-month period, Public Enterprises Minister Lynn Brown extended his contract as acting CEO of Eskom by a further three months in July 2015.

Simultaneously, it was announced that Transnet CFO Anoj Singh would be seconded to Eskom as acting CFO for a six-month period from August 1.

Transnet chief supply chain officer Garry Pita would serve as acting Transnet CFO during this time, while Transnet Freight Rail CEO Siyabonga Gama was acting CEO of Transnet.

Source: *Engineering News*

TFR CEO Siyabonga Gama, who was appointed acting CEO of the Transnet group in April 2015, told *Engineering News* that the group would not scale back on the MDS, despite economic headwinds and depressed commodity prices. He committed, however, to pursuing revenue diversification, stating that Transnet urgently had to implement its road-to-rail strategy in noncommodity sectors such as manufactured and fast-moving consumer goods products.

Meanwhile, National Treasury outlines in its February 2015 budget review that Transnet is expected to invest R36.3-billion, R44.7-billion and R46.8-billion in capex, including capital payments and finance costs, in the 2015/16, 2016/17 and 2017/18 financial years respectively. To help fund its capital investment plans, Transnet's borrowings for the 2015 financial year stood at R34.1-billion.

The coal export line

TFR transports domestic and export coal, with coal for export transported on a dedicated rail line that starts in the Mpumalanga coalfields and ends at the Richards Bay Coal Terminal (RBCT), a dedicated coal export terminal, in KwaZulu-Natal. Export coal rail volumes for the 2015 financial year were 76.3-million tons, 12% higher than the 68.2-million tons transported the year before, owing to improved product availability from key customers and improved resource availability through sustained implementation of the group's capital investment programme.

Gama revealed in July 2015 that Transnet was expecting export coal volumes to reach 77-million tons in the 2016 financial year, but warned that falling commodity prices and lower demand for commodities could impact the volumes transported. TFR plans to increase the capacity of its export coal rail line to 81-million tons by June 2018 and thereafter to 97.5-million tons in 2021. Transnet expects the total expansion and sustaining capital investment to amount to R45.5-billion over the next seven-year period of the MDS.

In the 2015 financial year, it spent R411-million on upgrading yards, lines and electrical equipment as part of the expansion to 81-million tons.

By mid-2014, TFR had initiated certain work packages as part of overall infrastructure investment to expand its rail capacity and had started acquiring land to construct substations on privately owned land. It had also started negotiations with State-owned electricity utility Eskom regarding the upgrade of the electrical supply between Ermelo, in Mpumalanga, and Richards Bay, in KwaZulu-Natal. Further, TFR took delivery of 110 Class 19E dual-voltage locomotives that are needed for the capacity expansion to 81-million tons a year.

Meanwhile, TFR, in collaboration with Swaziland Railways, is also considering the development of a 146 km railway line between Lothair, in Mpumalanga, and Sidvokodvo, in neighbouring Swaziland, which will enable it to divert the transportation of general freight from the Ermelo–Richards Bay rail line – about 12 general freight trains use this line daily – through Swaziland, resulting in only coal being transported on this rail line. The SwaziLink project, along with other initiatives, is expected to potentially increase the coal export rail line's capacity to 120-million tons a year and will also enable TFR to operate the line on a heavy-haul

Coal terminal

The Richards Bay Coal Terminal (RBCT), which is owned by 16 big and small coal mining companies, plans to export 74-million tons of coal in the 2015 calendar year, compared with the record 71.3-million tons exported the year before, when TFR railed a total of 72.4-million tons of coal. During the 2014 calendar year, about 27 trains a day called on the terminal, with the coal exported to Asia (67%), Europe (25%) and Africa (6.5%). The 91-million-ton-a-year capacity of the RBCT exceeds that of TFR's coal export rail line and preliminary research work has been undertaken on the potential Phase 6 expansion of the terminal to 110-million tons a year.

RBCT expects to export 77-million tonnes in the 2016 calendar year.

RBCT announced in July 2015 that it would invest R1.34-billion in replacing ageing equipment at the terminal. This would include the replacement of two stacker reclaimers and two shiploaders, while substations would also be reconfigured.

The equipment replacement programme will be completed by January 2018.

Source: *Mining Weekly*


TFR plans to increase the capacity of its export coal line up to 81-million tons by June 2018

Picture by Duane Daws

basis at all times. TFR and Swaziland Rail previously estimated that the project could cost between R16-billion and R17-billion.

Geotechnical difficulties have resulted in a delay in an investment decision on the SwaziLink project, with Gama saying in July 2015 that a business plan had been drawn up, but that the initial completion date would move to late 2019 or 2020, as opposed to the originally planned 2018 deadline.

In August 2014, as part of detailed planning processes, TFR signed a memorandum of understanding (MoU) with farmers and landowners in Lothair, on whose land some sectons of the railway line would be built.

Transnet outlines in its 2014 integrated annual report that it intends to build a further 700 km of rail network over the next five years, including the proposed 560 km Waterberg heavy-haul rail line that will link the Waterberg coalfield, in Limpopo, and coal resources from neighbouring Botswana, to the existing Ermelo–Richards Bay rail line, and subsequently the RBCT, and some of Eskom's coal-fired power stations. A feasibility study on the proposed project is under way and expected to be completed in August 2015.

Meanwhile, Transnet reported in October 2014 that it was planning to spend R1-billion for an "interim" ramp-up phase, from 2015 to 2019, to ensure an incremental increase to 26-million tons of coal transported from the Waterberg coalfield. This phase would run in parallel with the longer-term ambition to increase volumes from the Waterberg coalfield to between 40-million and 80-million tons a year from 2021.

Transnet further reported in October 2014 that TFR signed MoUs with various coal miners operating in the Waterberg coalfield, some of which had also signed commitments to transport 16-million tons by rail from as early as June 2016.

Gama noted in April 2015 that funding plans for the SwaziLink project and the proposed Waterberg rail line would differ from Transnet's traditional model. He said the Waterberg line would likely be implemented as a public–private partnership, while the SwaziLink project would be funded through a special purpose vehicle owned by Transnet and Swaziland Railways.

Further, TFR has concluded ten-year take-or-pay contracts with about 36 coal exporters, which commits TFR to provide trains as contracted and miners to pay for the contracted service regardless of whether they have product to move. Transnet is transitioning to the new individual customer contracts, from the previous collective agreement with the broader coal industry, to ensure it can recover the costs of its capital investment to expand the capacity of the Ermelo–Richards Bay coal export line.

The first of these contracts was finalised between BHP Billiton Energy Coal South Africa (Becsa) and TFR in September 2014. The contract, with an estimated value of R24-billion, will result in TFR transporting about 18-million tons a year of coal from Becsa's operations, in Mpumalanga, to the RBCT. Exxaro Resources, which exported 5.3-million tonnes of coal through the RBCT in 2014, confirmed in March 2015 that it too had signed a take-or-pay contract with TFR.

Transnet had initially expected to finalise all take-or-pay contracts by November 2014.

Mining major Glencore CEO Ivan Glasenberg, however, warned of the unintended consequences, particularly for fellow State-owned entity Eskom, of the take-or-pay contract model adopted by TFR. Glencore was concerned that the new contracts could potentially lead to coal miners incurring penalties for diverting coal volumes away from the export market to Eskom for use in its power stations. Many of Eskom's coal contracts are set to expire, while other mines that supply its power stations are set to close. Glencore explained that coal-fired power stations, in Australia, were sometimes forced to pay prices that were higher than export-parity prices for coal, partly as a result of coal miners facing penalties for not using their export-rail allocations. It warned that the same could happen in South Africa, with Eskom potentially facing higher costs and further security of supply challenges.

The iron-ore export line

TFR transports export iron-ore along an 861 km heavy-haul, single railway line between Sishen, in the Northern Cape, and the Port of Saldanha Bay, in the Western Cape. Export iron-ore rail volumes for the 2015 financial year increased to 59.7-million tons – a 10% increase on the 54.3-million tons transported the year before and nearly 3% higher than the 58.05-million tons it had targeted for the financial year.

The higher volumes were attributed to key customers having recovered from production constraints and the improvement in resource availability, owing to the group's sustained capital investment. Transnet expects to transport 62-million tons of iron-ore in the 2016 financial year.

As with its other infrastructure, TFR is also working to expand the capacity on its iron-ore rail line. In the 2014 financial year, it completed the R626-million investment, including the acquisition of 32 locomotives, to increase the rail line's capacity to 60-million tons.

While the TFR considered increasing the capacity of the Sishen–Saldanha line to 82.5-million tons by 2021, iron-ore producers have indicated that production capacity will be insufficient. Therefore, rail capacity will now be increased to 70-million tons by 2021.

The manganese export line

TFR is working to establish its third heavy-haul export rail line to facilitate the transportation of manganese ore from mines in the Northern Cape to the Port of Ngqura, in the Eastern Cape. Through the upgrade of the Postmasburg–Port Elizabeth–Ngqura rail line, the

Rail capacity on TFR's iron-ore export line is expected to be increased to 70-million tons by 2021

Picture by Duane Daws

deployment of 20E locomotives and wagons, as well as the development of infrastructure at the Port of Ngqura, TFR plans to increase export manganese ore volumes to 16-million tons a year by 2019.

In the 2015 financial year, TFR spent R466-million on upgrading the rail network between Hotazel and Coega and on building a new bulk terminal in Ngqura, as part of plans to increase capacity on the line. Transnet estimates that R39-billion in capital will have to be invested in the Port of Ngqura to accommodate the relocation of the manganese export terminal from Port Elizabeth to the Port of Ngqura, as well as for increasing container terminal capacity at Ngqura to meet transshipment demand. Transnet will also have to acquire land from the Coega Development Corporation to establish the Ngqura Manganese Terminal.

General Freight Business

TFR's General Freight Business (GFB), which transports various commodities, products and minerals, as well as containers, increased its rail volumes to 90.6-million tons in the 2015 financial year, up 3% from the 88-million tons transported in 2014.

Transnet attributed the increase in GFB rail volumes, in part, to the continued growth in market share, as a result of the road-to-rail modal shift; however, slow economic growth, slow recovery from industrial action and power supply constraints had offset the gains made.

TFR plans to expand the capacity of its GFB unit to 177-million tons by 2021. Some of the additional capacity would be created through the proposed diversion of general freight volumes away from the Ermelo–Richards Bay coal line and onto a proposed new rail link through Swaziland.

The GFB unit will require significant investment in new rolling stock to modernise its fleet and improve the reliability and availability of locomotives. Several contracts have been entered into for the supply of rolling stock.

Rolling stock for freight transport

In its 2014 integrated annual report, Transnet outlines that it intends to expand the number of locomotives for its rail business to 3 300 locomotives and the number of wagons to 85 000 in the next five years, compared with the 1 888 locomotives and 71 075 wagons in service at the end of March 2014.

It has taken delivery of 110 Class 19E dual-voltage locomotives to expand its coal line and has concluded a contract with China South Rail (CSR) to supply a further 100 electric locomotives for use on the coal line.

Sixty-one of these locomotives were delivered in the 2015 financial year, with the balance to be delivered by the end of the 2015 calendar year.

Meanwhile, to facilitate the increase in capacity on its iron-ore export line, TFR had previously acquired 44 Class 15E locomotives. In the 2014 financial year, it took delivery of a further 32 locomotives to ensure that the increase in capacity to 60-million tons a year could be accommodated.

TFR had also, by July 2013, taken delivery of 43 diesel locomotives to assist with efforts to increase the capacity of its GFB unit. It also took delivery of 147 new electric locomotives for the GFB operations during the 2015 financial year, with a further nine to have been delivered by the end of July 2015.

The R3-billion contract with CSR Zhuzhou Electric Locomotive – a joint venture between CSR and local company Matsete Basadi – was concluded in 2012. Ten of the locomotives were built at CSR's facilities, in China, and the remainder assembled at Transnet Engineering's (TE's) Koedoespoort facility, in South Africa's Gauteng province.

TFR had also, in January 2012, entered into a contract with General Electric (GE) for the supply of 60 Class 43 diesel locomotives, eight of which had been delivered by September 2014.

In October 2014, TFR revealed that it had also acquired 34 second-hand diesel locomotives from Australian rail company Aurizon, at a cost of between A$180 000 and $230 000 each, to boost its fleet ahead of the procurement of new locomotives by 2019.

TFR will procure a further 1 064 locomotives – 599 electric and 465 diesel – for its GFB unit by 2018 and has awarded tenders, worth a collective R50-billion,

TFR's rolling stock procurement programme is expected 60% localisation for all locomotives.

Picture by Duane Daws

to consortiums that are led by four major international locomotive manufacturers, namely GE, China North Rail (CNR), CSR and Bombardier Transportation. General Electric South Africa Technologies will supply 233 diesel locomotives, CNR Rolling Stock South Africa (CNR RSSA) 232 diesel locomotives, CSR Zhuzhou Electric Locomotive 359 electric locomotives and Bombardier Transportation South Africa (BTSA) 240 electric locomotives.

All 1 064 locomotives will be delivered by February 2018. The contracts have strict local-content requirements of 40% each, with only 70 locomotives to be internationally produced, and the remainder at TE's Koedoespoort and Durban facilities. In March 2015, Brian Molefe said the companies were likely to reach 60% localisation for all locomotives. Transnet also announced that it had secured two funding agreements, worth a collective R13-billion, with the Export–Import Bank of the US and Canadian export credit agency Export Development Canada in support of TFR's acquisition of diesel and electric locomotives from GE and Bombardier.

The US Export–Import Bank agreement entails a 14-year, R6-billion guarantee being extended to Transnet for the acquisition of diesel locomotives from GE. The guarantee assisted TFR in raising funds from South African financial institutions – R2.25-billion from Absa/Barclays, R2.25-billion from Standard Bank and R1.5-billion from Old Mutual. The majority of these locomotives will be assembled at TE's Koedoespoort facility.

Export Development Canada provided TFR a 13-year, R5.24-billion loan facility, which, together with a R1.75-billion loan from South Africa's Investec Bank, will be used to acquire 240 electric locomotives from Bombardier. These locomotives will be assembled at TE's Durban facility.

In June 2015, Transnet secured a R30-billion loan facility from the China Development Bank to fund the acquisition of 232 diesel and 359 electric locomotives from CNR and CSR. The first R18-billion will be drawn down over four years.

The loan forms part of a $5-billion bilateral MoU signed by President Jacob Zuma and Chinese President Xi Jinping in December 2014. Also in June 2015, the group secured a R2.8-billion loan from Germany's KfW Development Bank as part of funding for the 1 064 locomotive acquisition programme.

Transnet and CSR had also signed a MoU in December 2014, agreeing that the parties would cooperate to establish manufacturing plants and a research and development facility in South Africa, initiate and develop business opportunities in Africa, as well as skills transfer, besides others.

Transnet reported in May 2015 that Bombardier and GE had completed technical designs for their respective locomotives and that the first of GE's locomotives would be rolled out in July 2015. CSR Zhuzhou Electric Locomotive had also completed its technical design, and the first prototype had been produced at TE's Koedoespoort plant.

CNR's technical design was about 90% complete by March 2015, with these locomotives to be assembled at TE's Durban plant.

Rolls-Royce Power Systems has been awarded a €100-million contract to supply 232 MTU Series 4000 engines to CNR RSSA from 2015 to 2017 for use in the locomotives it will supply to TFR.

Meanwhile, Transnet will in the coming months consider the potential of using vehicles capable of operating on rail tracks and roads on its Western/Nothern Cape and Natal corridors. Transnet Engineering had, meanwhile, manufactured and delivered 2 700 wagons for TFR in the 2015 financial year.

Locomotive acquisition programme – estimated delivery schedule

	General Freight Business				Export Coal
Year	95 electric locomotives	1 064 locomotives	60 diesel locomotives	Wagons	100 electric locomotives
2016	1	148	35	2 100	863
2017	–	492	–	1 700	–
2018	–	424	–	1 250	–
2019	–	–	–	1 050	–
2020	–	–	–	1 000	–
2021	–	–	–	900	–

Source: Transnet results presentation for the year ended March 31, 2015.

Passenger transport by rail

The Passenger Rail Agency of South Africa

Passenger rail transport in South Africa is predominantly the responsibility of the Passenger Rail Agency of South Africa (PRASA), which was established in 2009 through the consolidation of all passenger rail entities, including the former South African Rail Commuter Corporation, Metrorail, Autopax and Shosholoza Meyl, into one State-owned entity.

PRASA, which employs about 18 000 people, operates in six cities and owns about 317 railway stations. Its Metrorail services form the bulk of PRASA's commuter rail operations, transporting more than two-million people to and from work every weekday and making an estimated 500-million passenger trips a year. Metrorail services are available in the Western Cape, Gauteng, KwaZulu-Natal and the Eastern Cape, with Metrorail managing 468 stations. It has a fleet of about 270 train sets, which equates to about 3 100 passenger coaches.

Metrorail also offers a business express service in some areas, providing a more comfortable and luxurious rail offering, but at a higher fare, for commuters travelling on these trains. Cabin and security crew, a complementary daily newspaper and refreshments form part of the business express experience. This service was first introduced in 2007, operating between Soweto and Johannesburg, and Khayelitsha and Cape Town.

The Tshwane Business Express, operating between Pretoria and Johannesburg, was introduced in 2008, followed by the Premium Express, operating between Strand and Cape Town, in 2009. In the same year, the Gauteng Business Express, operating between Pretoria and Johannesburg, was launched.

PRASA's mainline passenger services (MLPS), which provides intercity rail services between Johannesburg and Pretoria, in Gauteng, and other cities, including Cape Town, Durban, East London and Port Elizabeth, comprises the Shosholoza Meyl and Premier Classe operations. The number of MLPS passengers decreased to 900 000 in the 2013/14 financial year, below the 1.4-million-passenger target for the year and much lower than the three-million passengers who used these services in 2009/10. This resulted in a R700-million a year loss for PRASA.

The Department of Transport (DoT) had halted an operational subsidy for Shosholoza Meyl in the 2010/11 financial year. Meanwhile, the number of operational trains for the MLPS has decreased to less than 3 000 a year, from 6 000 a year in 2009/10. To mitigate the falling MLPS passenger numbers, PRASA has embarked on a turnaround strategy and is now expected to submit quarterly reports regarding the progress made to the DoT.

In November 2014, Metrorail announced that it would cancel some of its MLPS routes, which were deemed too costly to maintain, as the cost coverage on these routes were less than 20%.

PRASA had, meanwhile, recorded revenues of R10.2-billion in the 2013/14 financial year, 21.1% higher than R8.4-billion in 2012/13, largely owing to government's injection of a R4.3-billion subsidy to ensure the provision of affordable commuter rail services to South Africans.

National Treasury estimates that PRASA's fare revenue will increase by 7.8% a year in the medium term as the number of Metrorail passenger trips increases.

Treasury further reveals that PRASA spent R6.2-billion on capital investment in 2013/14, compared with R6.3-billion the year before. The first phase of the agency's 20-year rolling stock fleet renewal programme started in 2014.

The programme aims to modernise passenger rail services through the introduction of new trains to replace ageing rolling stock, with an average age of more than 40 years, and to mitigate the impact of limited rolling stock, owing to many years of underinvestment.

To further improve passenger rail services in the country, PRASA is upgrading its infrastructure and facilitating the replacement of its signalling systems to ensure the safer and more predictable movement of its trains. These upgrades are also expected to result in more reliable train services for commuters and to boost South Africa's local manufacturing sector.

Leadership change

Former Passenger Rail Agency of South Africa (PRASA) CEO Lucky Montana left the organisation in July 2015. He had initially been expected to serve out the term of his contract until March 1, 2016. However, after questions were raised about the technical and safety standards of newly acquired diesel locomotives from Spain, and the escalating costs of having acquired the locomotives, he stepped down.

PRASA rolling stock

The agency's rolling stock fleet renewal programme will result in it investing R123-billion over 20 years to acquire about 7 200 new rail vehicles by 2034. The programme will be rolled out in two phases, with the first phase involving the supply of 600 trains, comprising 3 600 coaches, over a ten-year period to 2024.

PRASA signed a R51-billion deal with Gibela Rail Transport Consortium, comprising Alstom (61%), Ubumbano Rail (30%) and New Africa Rail (9%) in October 2013, to supply the first 600 trains between 2015 and 2025.

Ubumbano Rail comprises several companies that are keen to enter the rail sector space as suppliers.

The three commercial entities in Ubumbano Rail are Khipunyawo Rail, the Elgin-Identity Rail Corporation, and Community Rail.

Other shareholders in Ubumbano Rail include the PRASA Employee Share Option Trust (ESOP), the Gibela ESOP and an education trust.

Source: Engineering News

The Gibela consortium's X'Trapolis megatrain

Picture by PRASA

New opportunities

Specialist foundry Steloy Castings has established a new division – Steloy Rail Division – to service the rail industry and position the company for potential participation in the Passenger Rail Agency of South Africa's (PRASA's) and Transnet Freight Rail's rolling stock replacement programmes, which have high local-content requirements. The foundry says PRASA's R123-billion rolling stock fleet renewal programme is resulting in large-scale orders for the casting industry. To meet the standards of the multinational rolling stock manufacturers that will produce locomotives for the South African market, Steloy has upgraded its design, project management, castings, machining and nondestructive testing facilities.

Source: *Engineering News*

The consortium will provide PRASA with Alstom's X'Trapolis Mega train, with each train comprising six cars capable of transporting more than 1 300 passengers. The trains will travel at speeds of up to 120 km/h and could be upgraded to 160 km/h. The first 20 trains are being manufactured at Alstom's Lapa facility, in São Paulo, Brazil, while a R1-billion 85 000 m^2 local manufacturing facility will be built in Dunnottar, Ekurhuleni, to manufacture the balance of the trains. Construction on the facility had initially been expected to start in 2014, but the start of construction has been delayed numerous times. The latest date for the start of construction given by Gibela is the third quarter of 2015.

Once in full production, the factory will produce 62 trains a year. Gibela aims to ensure a 65% localisation target for all trains, in line with the terms of its contract. In July 2014, the consortium had preselected 100 local companies as potential suppliers of components and services. It aims to source up to R30-billion in components and services from black enterprises up to 2035. Granger noted in an August 2014 interview with *Engineering News* that several of these enterprises would have to be developed to achieve the quality of work and the required quantities of components.

In a May 2015 interview, he told *Engineering News* that there were few black companies that were active in the South African rail sector and that there was a "technology gap" in terms of local companies' ability to produce the right product with a specific quality at a specific time. He stated that the manufacturing rate required for the on-time delivery of the trains to PRASA matched that of an experienced, large-scale original-equipment manufacturer operating at its peak level. Despite the "technology gap", Gibela remained committed to meeting localisation targets and had established a specialised programme to ensure it appointed the suppliers it needed.

Further, he emphasised that suppliers would have to offer competitive pricing, as Gibela would not pay a premium for locally produced components.

Gibela had produced the first 9 t car body-shell in Brazil in November 2014. The car body-shell was made from carbon and stainless steel imported from South African suppliers. More than 1 000 components, including electrical equipment, traction motors, bogies, cables, pipes, air-conditioning systems, doors and interior finishes, will be fitted to the shell before its delivery to South Africa in November 2015.

Once in South Africa, it will undergo real-world testing and evaluation before being put into operation, which is expected to occur in June 2016.

The first phase of the rolling stock fleet renewal programme is expected to create 1 500 direct jobs and 8 000 indirect jobs, while about R800-million will be spent on skills development, R746-million on the development of local rail-sector enterprises and R273-million on community programmes.

Gibela will also provide maintenance, spare parts and technical support for PRASA over a 19-year period in terms of a deal worth about R10-billion. Alstom will establish five maintenance depots – two in Gauteng, two in KwaZulu-Natal and one in the Eastern Cape – that will provide fault-finding support, reliability engineers, controls and monitoring, and material requirement planning. Gibela will also establish two repair centres in Salt River and Durban.

PRASA, meanwhile, is reportedly behind schedule on a R5-billion depot modernisation programme for the testing of the new trains being acquired from Gibela. It is also said to have missed deadlines for the construction and upgrade of perways, platforms and other structures. While the rail agency has acknowledged the delay in the depot modernisation programme, it has denied that the perways and platforms are needed for the testing of the trains.

While PRASA awaits the delivery of its new rolling stock, it continues to refurbish its existing Metrorail fleet, which will have to continue to operate until the phased delivery of the new trains. The rail agency invested about R2.1-billion in the refurbishment of 570 coaches from 2010 to 2014. In the 2014 financial year, it spent R1.9-billion on the refurbishment of 566 coaches, which was higher than its intended target of 500 coaches. It had also appointed Commuter Transport & Locomotives Engineering to refurbish 100 coaches during the 2015 financial year. It took between 40 and 49 days to refurbish each coach.

Meanwhile, PRASA also expects to take delivery of 70 new long-haul passenger locomotives up to 2016 from Spain-based Vossloh. The locomotives, which will primarily be used for the MLPS Shosholoza Meyl and Premier Classe operations, are being leased to PRASA by Swifambo Rail Leasing, with the first 13 AFRO 4000 series diesel locomotives, which were acquired at a cost of R600-million, in various stages of testing by July 2015.

Twenty of the 70 locomotives will be AFRO 4000 series diesel locomotives, which will travel at speeds of between 120 km/h and 130 km/h and are expected to reduce maintenance costs and diesel consumption. The other 50 locomotives will be hybrid locomotives.

Allegations emerged in July 2015 that the AFRO 4000 locomotives were too tall for existing rail tracks and that this could damage overhead electrical cables. Former PRASA CEO Lucky Montana, who was, in July 2015, amid the furore over the procurement of the locomotives, asked to leave his post immediately without serving out the remaining six months of his contract, had assured the public that the locomotives met all safety and technical specifications.

PRASA Rail CEO Mossengwa Mofi explained at the time that the AFRO 4000 locomotives had a roof height of 4 100 mm and that there was 150 mm between the roof of the locomotive and electrical contact wires, in line with safety specifications.

Later that month, questions also emerged about the qualifications of PRASA's chief rail engineering Dr Daniel Mtimkulu, who had been instrumental in the procurement of the locomotives. He was, at first, suspended while PRASA conducted an investigation into the allegations that he did not have the qualifications he claimed to have had, and was later fired from his position. He was also facing criminal charges of alleged fraud.

The Railway Safety Regulator was, meanwhile, expecting to have a report on the results of tests on the AFRO 4000 locomotives available by the end of August 2015. The procurement of the locomotives from Swifambo has faced scrutiny since the tender was first awarded.

South Africa's auditor-general determined in 2013 that PRASA had contravened its supply-chain management policy, stating that the evaluation criteria used by the rail agency in awarding the tender to Swifambo had not been consistent with that set out in its request for proposals. The auditor-general argued that Swifambo should have been disqualified as a bidder for the tender, as it had not supplied letters of good standing from the relevant tax authority. Further, the tender documents had not been signed by the bidder and its subcontractor and there had been insufficient evidence of a subcontracting relationship between Swifambo and the subcontractor when the bid was evaluated.

The auditor-general's findings followed a call by opposition party Democratic Alliance for an investigation into the awarding of the tender, as the locomotives were more expensive than those being acquired by Transnet.

Six bids had been received for the tender, with Harvdap, General Electric South Africa Technology, RRL Grindrod, Thelo Rolling Stock Leasing and CRM Consortium being the other bidders. The high cost of the locomotives was again highlighted in July 2015, when it was revealed that inadequate foreign currency hedging by PRASA had pushed the cost of the 70 locomotives to R4.8-billion, compared with the initial contract amount of R3.5-billion.

This had also resulted in a decrease in the number of locomotives to be acquired to 70, from the initially envisaged 88.

Public Protector Thuli Madonsela had been due to release a report on her investigations into allegations of financial mismanagement, tender irregularities and appointment irregularaties against PRASA in July 2015, but the release of the report had been delayed.

PRASA rail infrastructure improvements

PRASA will invest R170-billion in improving its services from 2014 to 2024. This includes the R123-billion being spent on the procurement of new rolling stock, upgrading signalling networks and train stations, modernising rail depots, and upgrading or extending existing rail lines.

As part of its infrastructure upgrade plans, PRASA launched its new R1.3-billion Bridge City rail extension, in KwaZulu-Natal, in October 2013, with the service becoming operational in February 2014. The project entailed the construction of a railway station, in KwaMashu, and a 3.5 km dual rail link that connects the Bridge City shopping centre with existing rail lines.

The rail agency is also working to upgrade many of its train stations, with 80 of them upgraded during the 2013/14 financial year. PRASA will invest R1.3-billion on its national station upgrade programme to 2018, in addition to the R1-billion spent on the upgrade of various stations in the five years to 2015. The programme aims to modernise PRASA's train stations through the implementation of speed gates, electronic display boards, flexible ticketing and improved passenger security.

In April 2015, PRASA opened the first phase of the upgraded Parade Concourse at the Cape Town rail station, which is used by about 145 000 people a day. Construction on the R126-million project started in 2013.

Through the upgrade of its rail stations, the rail agency plans to turn these into commercial hubs, which are expected to generate additional income to subsidise the cost of train tickets.

Outgoing PRASA CEO Lucky Montana said in April 2015 that the agency hoped to unlock revenues of about R1-billion a year from its property portfolio from 2018. The agency's property portfolio currently generated about R220-million a year in revenues. PRASA had also spent R370-million on the construction of a train station at Nasrec, in Gauteng, where it introduced its new Nasrec Metroplus Express service in October 2014. The station is expected to serve as a commuter hub for commuters travelling from the south of Johannesburg to the Johannesburg CBD and can accommodate 40 000 commuters. A further R65-million will be invested by PRASA to introduce a business express train on this rail corridor.

Meanwhile, PRASA has also been tasked with developing a rail line along the R573 Moloto road between Mpumalanga and Gauteng, which carries about 35 000 commuters a day.

The road is known for serious road accidents and many fatalities. The rail link, which will cost about R12-billion to develop, is expected to lead to a decrease in the number of road accidents, injuries and fatalities by providing commuters with a modern integrated transport system.

A public–private partnership plan has been developed for the Moloto Rail Development corridor. A feasibility study on the corridor was completed in October 2014, with the Cape Gauge railway recommended as the best option for the development, as it would integrate seamlessly with the existing rail lines to which it will link. The rail agency will also invest up to R17-billion on a new signalling system for its high-volume corridors by 2018. PRASA has awarded Siemens South Africa two contracts to upgrade its signalling infrastructure in Gauteng.

The first contract, valued at about R1-billion, was awarded in 2011 and involved upgrading one-quarter of the province's signalling system. The R2.76-billion Phase 2 contract to upgrade the remainder of the system was awarded in December 2013 and included the construction of a Gauteng Nerve Centre, which was expected to be completed by March 2015.

PRASA's rail signalling system, in KwaZulu-Natal, is also being upgraded through a R1.1-billion contract awarded to Bombardier Africa Alliance, which includes BTSA. The project will result in the signalling of 42 stations and 120 km of double track being upgraded, with BTSA telling *Engineering News* in November 2014 that it was in the final stages of completing the design phases for the project, which will be completed in 2017. The first line is expected to be completed by May 2015.

PRASA will invest up to R17-billion on a new rail signalling system for its high-volume corridors by 2018.

Picture by Duane Daws

In the Western Cape, the Thales-Maziya Consortium was awarded a R1.87-billion contract to upgrade the rail signalling system in the province.

The contract will result in the upgrading of the signalling at 46 stations along 250 km of track.

The Gautrain

The 80 km rapid rail and integrated bus system, the Gautrain, links Pretoria and Johannesburg and offers a dedicated service for passengers travelling to OR Tambo International Airport. The system, on which construction started in 2006, was developed through a public–private partnership between the Gauteng provincial government and the Bombela Concession Company (Bombela).

Bombela was awarded the tender to design, build and partially finance the Gautrain, as well as to operate and maintain the system over a 15-year period. Operations between the OR Tambo International Airport and Sandton stations started in June 2010, ahead of South Africa's hosting the 2010 FIFA World Cup. The route between the Rosebank and Park stations, in Johannesburg, and Hatfield station, in Pretoria, started operating in August 2011 and, by June 2012, the final phase between the Rosebank and the Park stations was launched. The Gautrain Management Agency (GMA) oversees the management of the system on behalf of the Gauteng provincial government, while Bombela is the operator.

The system had reached a peak ridership of 63 000 passengers every weekday during 2014, and this decreased to 55 000 passengers every weekday in January 2015, far short of the 110 000 passengers it had been expected to carry when the project was being developed. The Gauteng government is obligated to pay Bombela a subsidy until the 110 000 passenger ridership target is reached. In the past, the subsidy had amounted to about R850-million to R900-million a year, but Gauteng Transport MEC Ismail Vadi reveaked in June 2015 that the subsidy had now increased to R1.5-billion. The announcement drew criticism from the Automobile Association, which argued that the subsidy could fund the yearly payback costs of the Gauteng Freeway Improvement Project (GFIP), excluding the cost of tolling infrastructure.

However, a study by KPMG has determined that the Gautrain project has contributed about R20-billion to the Gauteng provincial gross domestic product (GDP) over the six years that it was being built, as well as a further R1.7-billion a year contribution to GDP that it was

GMA leadership

Gauteng MEC for Roads and Transport Dr Ismail Vadi announced in February 2015 the reappointment of four Gautrain Management Agency (GMA) board members for the new three-year term, which started on January 1, 2015, as well as the appointment of various new board members.

Motseoa Alix-Mary Lugemwa has been appointed chairperson and Doris Dondur deputy chairperson, while Jack van der Merwe retains his position as CEO. Mzolisi Nkumanda and Professor Wellington Thwala have also been reappointed to the board. New board members include Bolokang Lengane, Sebina Hlapolosa, Unathi Mntoninthsi and Satish Roopa.

Representatives of the Gauteng Provincial Treasury, the national Department of Transport and the Gauteng Department of Roads and Transport have been appointed to advise the board on the views, interests and policies of their respective organisations.

Source: *Engineering News*

operational. About 22 000 people a week used the bus services in January 2015. GMA CEO Jack van der Merwe attributed the decrease in passenger numbers to uncertainty about the implementation of e-tolling on the GFIP. Bombela had expected that the start of e-tolling on the GFIP in late 2013 would boost ridership numbers, as the tolls were expected to increase vehicle ownership costs by between R1 200 and R1 500 a month; however, government has since implemented lower toll costs, while many using the GFIP road network are simply refusing to pay e-tolls.

Further possible deterrents to using the Gautrain have been several unplanned strikes by bus drivers, leaving train passengers stranded at stations, as well as interruptions in services, owing to electricity cable theft that impacts on train operations. Rail undercapacity at peak times is also of concern to commuters. Consequently, the GMA is offering discounts for commuters who use the Gautrain and bus services at offpeak times to alleviate the overcrowding at peak times. Bombela also indicated in January 2015 that the "headway" between trains at peak times would be reduced from 12 to 10 minutes to provide for one additional train every hour, while it was also planning to secure additional rolling stock for the system, with the biggest challenge hampering this being funding.

In July 2015, Vadi said a request for proposals would be published in September 2015 for the procurement of 12 additional train sets for the Gautrain. This would cost between R2.5-billion and R4-billion, with Bombela Concession Company overseeing the tender process. The acquisition would be funded by the Gauteng provincial government and the Development Bank of Southern Africa. Meanwhile, plans under way to add eight more stations to the existing network of ten Gautrain stations, with the GMA conducting feasibility work into potentially expanding the system along four routes. The proposed expansion, which is expected to increase the network to 200 km, entails the development of links from Park station to Westgate; Rhodesfield station to Boksburg; Sandton station to Randburg and Honeydew; and from Naledi, in Soweto, to Mamelodi.

The proposed expansion follows the completion in 2014 of a 25-year Integrated Transport Master Plan that aims to ensure transport planning and urban spatial planning cohere, as well as integration between the various transport modes. In October 2014, the Gauteng provincial government announced that it had appointed a the SMEC Consortium, comprising SMEC South Africa, DLA Cliffe Dekker Hofmeyr and Deloitte, as transaction advisers to undertake the feasibility study on extending the Gautrain system. The feasibility study is expected to consider the transformational impact of the expansion on the province's economy, the modernisation of public transport, passenger access and mobility, the environmental impact of the proposed expansion and benefits such as job creation and poverty alleviation. The feasibility study is expected to be concluded in January 2016. GMA CEO Jack van der Merwe told Engineering News in January 2015 that it would be easier to gain support for the proposed expansion than it had been to convince the country about the implementation of the existing Gautrain service, as people were now aware of the benefits of the system.

Meanwhile, he also pointed out that the proposed expansions could tie in with PRASA's investment in new rolling stock for its Metrorail service, with the expanded Gautrain system potentially using similar coaches to that used by PRASA or modified coaches. He indicated that not all expansions would necessarily be under the Gautrain brand.

Meanwhile, Bombela stated in January 2015 that the method, timeline and costs to deal with the water ingress into the Gautrain tunnel between emergency shaft 2 (E2) and Park station was yet to be finalised. This followed a November 2013 arbitration tribunal ruling that Bombela should undertake remedial work on the tunnel section. The tribunal had determined that the tunnel section between E2 and Park station, as well as the tunnel section between Rosebank station and the Marlboro portal, had not been built in accordance with contract specifications. A panel of local and international technical experts had investigated options to comply with the tribunal's order and a report was submitted to Bombela and the GMA in July 2014. All stakeholders are now considering the best way forward.

Rail safety

In its latest 'State of Safety' report, the Rail Safety Regulator (RSR) says that 4 587 operational occurrences – collisions during the movement of rolling stock, derailments, people getting struck by trains, people-related incidents, level-crossing incidents and fires – took place during 2013/14. Subsequently, 1 498 people were injured and 456 fatalities were recorded.

The statistics showed a 7% year-on-year increase in operational occurrences, with security-related incidents, including theft and vandalism, increasing by 14% year-on-year to 4 703 incidents in 2013/14.

TFR and PRASA accounted for 88% and 95% of all operational occurrences and safety-related incidents respectively that occurred in 2013/14. Overall, these incidents cost TFR R411.8-million in the 2013/14 financial year, compared with R388.3-million the year before. The cost to PRASA, however, decreased to R130.3-million for 2013/14, compared with R167.6-million the year before.

The majority of the safety-related incidents occurred in Gauteng, KwaZulu-Natal and the Western Cape, with 65% involving the theft of assets, 22% vandalism, 6% the personal safety of persons travelling on trains, 5% the personal safety of persons at train stations and 1% the personal safety of people outside the station platform area. The RSR report further notes that the theft and vandalism of electrical and signal cables not only resulted in severe service disruptions and increased costs for railway operations but also contributed to ten fatalities and 379 injuries during 2013/14.

Meanwhile, although the number of level crossing incidents has decreased from 181 in 2009/10 to 116 in 2013/14, such incidents remain a concern, given that schoolchildren being transported to school in minibus taxis were injured or killed in such incidents. Eighteen fatalities and 66 injuries were recorded in the 116 level crossing incidents in 2013/14 – representing decreases of 52% and 9% respectively on the fatalities and injuries reported the year before.

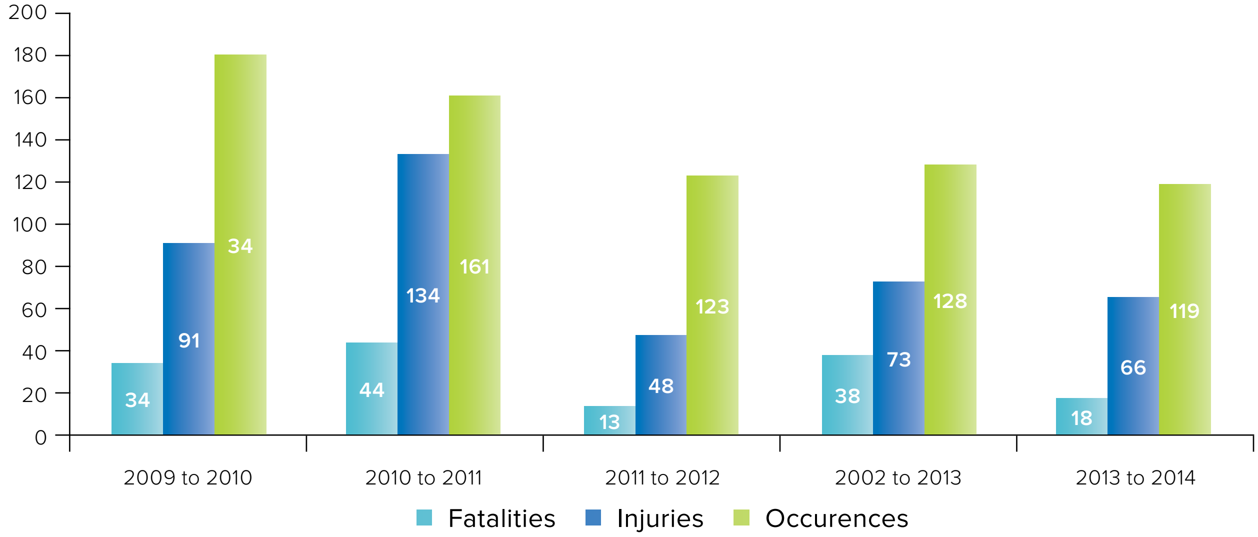
While the RSR is actively working to ensure that communities understand the potential danger of their interaction with train operations, TE has developed a new automated, level-crossing traffic-control mechanism, which the company says makes it impossible for a vehicle to cross a railway line while a train is approaching.

The system, which was unveiled to the media in November 2014, uses hydraulically operated road blockers that rise up from the road surface when a train is approaching the level crossing.

The system has been installed at two sites – Boshoek, in the North West, and Leeuwpan, in Delmas, Mpumalanga. It is also being installed at Muldersvlei in Stellenbosch, and Worcester, both in the Western Cape.

Subject to budget, governance and other considerations, Transnet plans to roll out, in phases, the installation of the system at more than 4 000 level crossings across South Africa.

All operators 2009/10 to 2013/14 total number of level crossing occurrences and the resulting fatalities and injuries



Source: Rail Safety Regulator State of Safety Report 2013/2014

Outlook

Massive investment is being made to improve South Africa's road and rail infrastructure.

Several multimillion-rand national and provincial road construction and upgrade projects are under way, with others to follow. Despite facing some financial headwinds amid uncertainty about the collection of e-tolls on the Gauteng Freeway Improvement Project, and other proposed toll routes, the South African National Roads Agency Limited continues to invest in its toll and nontoll road network – directly and through its concessionaires. It is also increasingly being mandated by government to undertake upgrades and improvements on key provincial roads, such as the infamous Moloto road, where provinces have been unable to undertake such projects.

Meanwhile, despite the taxi industry remaining the biggest transporter of commuters in South Africa, several cities have with varying degrees of success started the progressive roll-out of bus-rapid transit (BRT) systems to provide reliable and safe public transport for citizens. Construction on the various

Pictures by Duane Daws

Pictures by Duane Daws

BRT systems is taking place rapidly, with some cities opting from the outset to develop integrated rapid public transport networks that include various transport options, including bus and rail services.

Government also continues to pursue opportunities to move more rail-friendly freight from the road system onto the rail system. As part of this strategy, State-owned Transnet is investing more than R200-billion of its R312-billion Market Demand Strategy spend in its rail network. The investment will result in capacity expansions along various rail lines, including those used for transporting coal and iron-ore to ports for export. Transnet Freight Rail's (TFR's) General Freight Business will also have its capacity expanded. To enable the capacity expansions, TFR is investing in new rolling stock for its various business units.

Similarly, the Passenger Rail Agency of South Africa is also investing in infrastructure upgrades and the acquisition of new rolling stock to improve its services to the public.

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