OPPORTUNITIES AND RISKS

Risk management within Transnet

Transnet's top risks for 2017

The strategic risks of Transnet are reassessed on an annual basis by considering the best available information on changes in both the internal and external environments of the organisation. Risks are evaluated and assessed on an inherent risk basis, before current controls are considered. The control effectiveness of the current basket of controls is rated by the Group Leadership Team and expressed as a percentage. This results in a residual risk rating per risk.

Figure 14

Transnet's top 10 material risks for 2017 and the year-on-year movement of the top 10 risks from the prior year

Risk ranking/ priority	Level	Impact on net operating profit range
Priority I risk	GCE and Board level	> R1 billion
Priority II risk	Operating Divisions' CE level	R100 million to R999 million
Priority III risk	General Managers' level	R10 million to R99 million
Priority IV risk	Managers' level	R100 000 to R9,9 million
Priority V risk	Employees' level	< R100 000

○ Residual risk profile 2016

1. Macroeconomic environment risk
2. Energy supply risk
3. Capital execution risk
4. People management risk
5. Pricing risk
6. ICT risk
7. Productivity and efficiency risk
8. Operational readiness risk
9. Regulatory risk
10. Volume growth risk

● Residual risk profile 2017

1. Pricing risk
2. Capital execution risk
3. Macroeconomic environment risk
4. Volume growth risk
5. Operational readiness risk
6. People management risk
7. Productivity and efficiency risk
8. Regulatory risk
9. ICT risk
10. Environmental risk

Probability key

5-20 | 25-30 | 35-55 | 60-80 | 85-100

In reviewing the Company's key risks, we consider both internal and external factors to understand the interconnectedness of risks and to appreciate the possible impacts. Risk sponsors are assigned to each strategic risk to ensure mitigation strategies areas are aligned across all operations. Risks are ranked according to the residual risk rating after considering the adequacy and effectiveness of controls that mitigate those risks.

The risks and opportunities arising from material aspects

Material aspects	Risks and opportunities
Build social trust through ethical leadership and corporate citizenship	
Ethics management within Transnet (P.11)	• Practices that lead to Government intervention to rebalance infrastructural disparities can lead to ethical transgressions within our stakeholder relationships. Perceptions of potentially anti-competitive behaviour and corruption negatively impact reputation and investment sentiment. • Sound corporate governance and a track record of ethical leadership can attract local and foreign investment and promote a strong reputation.
Responding to stakeholder issues	• Negative stakeholder sentiment could adversely impact beyond the business – affecting international investor confidence. • Our ability to engage stakeholders positively encourages positive contribution from stakeholders to support Transnet's MDS, supports customer retention, counters competitive resistance, and attracts critical scarce talent and investor confidence.
Managing our environmental impact	• Environmental risks relate to the adverse impacts of secure supply of energy, water shortages and adverse weather patterns on the business. • We can set leading precedents in the management of waste and pollution within operations, particularly in view of our cross-border expansion strategy. This leadership may extend to the implementation and sharing of innovative conservation models with regional partners.
Partnering communities to build mutual value	• Risk of adverse impacts on communities could lead to reputational risks and challenge our social licence to operate. • Transnet has many opportunities beyond simply investing in CSI initiatives to improve the lives of communities, e.g. localised procurement and employment where feasible, Enterprise Development, collaboration on safety and the environment, and targeted investment in social services.
Unlock organisational value by attracting talent, fostering innovation and building unity	
Promoting health and safety	• Major safety risks relate to employees' adherence to standard operating procedures within our highly industrial operating environment and public safety at level crossings. • Improving staff adherence to standard operating procedures improves the safety environment Company-wide. Employees gain greater understanding and accountability for their operational impacts on colleagues, the environment and communities while reducing business interruptions.
Having the right skills at the right time	• Risk of operational staff not skilled for future operations, and lack of scarce skills in the job market means we compete with other engineering firms and SOCs. • As an employer, Transnet can attract scarce technical skills in demand, resulting in improved staff retention, which in turn results in sustained productivity.
Operational efficiency	• Low productivity levels due to absenteeism, strike action or operational inefficiencies lead to unreliable services, reduced asset performance and adverse impacts on service delivery levels. • Operational efficiencies have both financial and market impacts. Our efficiency gains improve operational efficiency of the freight logistics system. Logistics productivity and reliability are critical determining factors in shaping the country's ability to compete globally.
Investing in emerging technologies	• Digitalisation enables the organisation to move into markets previously not considered due to legacy business models and associated processes. The organisation can now harvest its data and provide its customers with end-to-end value chain logistics capabilities. • The business model of the digital organisation is different to current business models and will require Transnet to re-imagine itself in the digital economy.
Business continuity	• The risk that essential business functions are interrupted during or after a disaster, operational incident or challenges, such as load-shedding or inadequate ICT infrastructure, which extends to cybersecurity failures.

Material aspects	Risks and opportunities
Ensure long-term financial stability in a tough economy	
Capital investment and progress on major projects	• The risk of Transnet not realising the benefits from its capital investments, with lower economic activity both locally and internationally, leading to a lack of market demand. • Through the MDS, we facilitate broad-scale opportunities by delivering major infrastructure benefit to the country and promoting the localisation of supply on mega-projects, thereby building industrial capability.
Funding and liquidity	• Inadequate liquidity can negatively impact the Company's going-concern status and impact our credit rating, cost of funds and investment plans. The high cost of funds impacts the cash interest cover. • Private Sector Participation (PSP) enables Transnet to broaden the available finance pool and expedite infrastructure development and capacity creation, and encourages foreign direct investment in South African and regional infrastructure.
Pricing and tariffs	• Unless the relationships with Regulators are strategically managed, tariff decisions could impact negatively on investment decisions, investor confidence and ultimately on the execution of the Company's strategy. • To justify tariff increases (resulting in improved service pricing), Transnet must provide infrastructure service reliability and technical innovation commensurate with tariff increases. Through operational efficiency and R&D activities, we enhance infrastructure reliability, as well as our technical expertise. Efficiency and productivity gains also strengthen our market position.
Ensure customer-centricity and build partnerships for sustainable growth	
Volume and revenue growth	• The risk of not attracting and sustaining additional volumes as new capacity is created and to protect current volumes against new entrants. • Opportunity to capture greater market share in the domestic transport market through the road-to-rail strategy and extending the Company's footprint across the border into the rest of the African continent and the Middle East.
Expanding Transnet's business on the continent	• Regional risks associated with regional expansion include socio-economic and political instability in operating countries and operational risks around planning, staffing and operationalising of the regional business. • While economic growth forecasts for developing countries are muted, the region is in need of significantly improved infrastructure connectivity, which Transnet can help to facilitate through its Africa expansion strategy.
Fostering lasting customer relationships	• The risk that poor client service delivery results in strained relationships with customers. • Mutually beneficial customer relationships facilitate long-term planning of commodity performance with customers, including global planning around commodity demand and South Africa's global market position – particularly valuable in the current macroeconomic climate.
Facilitating private-sector investment in logistics	• Collaborative partnerships with customers and private-sector partners can support end-to-end logistics service solutions. These partnerships will become increasingly critical as Transnet moves from its current status as a third-party logistics (3PL) service provider to fourth-party logistics (4PL) service provider.
Promote transformation and growth in the wider South African economy	
Promoting transformation Localisation of supply Creating and sustaining jobs	As a SOC, Transnet is expected to deliver on Government's socio-economic, developmental imperatives (job creation, skills development, transformation and localisation). As one of South Africa's largest single employers and one of the country's largest infrastructure investors and network operators, Transnet is well placed to promote social value creation through employment equity in the Company and black economic empowerment through our suppliers. Transnet promotes training, skills development and local technology transfer, particularly through our relationships with OEMs in our locomotives acquisition programme. The scale and scope of our procurement expenditure will create and empower local black business in many sectors, and lead industry through new technological innovations.

Internal sources of risks
(aspects of business activities)

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- Product planning, design and manufacture
- Specialist skills and knowledge deployment
- Quality, cost-competitiveness and technological advantage
- Processes, training and relationship management
- Market differentiation
- Business model

Residual risk profiles of the top 10 risk heat map

● 2017
○ 2016

Residual risk
Inherent risk

- Priority I risk – GCE and Board level
- Priority II risk – Operating Divisions' CE level
- Priority III risk – General Managers' level
- Priority IV risk – Managers' level
- Priority V risk – Employees' level

Risk description	Root causes	Impact(s) on value	Key control strategies

Pricing risk
Pricing/tariff guidelines, methodologies and models not supportive of volume growth
5 1
	• **Non-regulated pricing:** Models and methods not flexible enough to be competitive
	• **Regulated pricing:** Tariff guidelines not supportive of volume growth
		• Not meeting planned volume growth
		• Impacting adversely on financial results
		• Slowing down the road-to-rail strategy
			Key regulated pricing controls
			• National Ports Authority applies the Ports Regulator's approved TM to ensure regulatory and revenue certainty. Ports Regulator does not account for inflationary increases.
			• Pipelines applies for its petroleum pipelines tariffs on an annual basis due to NMPP project challenges.
			• Ministerial Task Team was established to develop the Interim Rail Economic Regulatory Capacity for Freight Rail.
			• Economic regulation of Freight Rail will put pressure on future revenue streams.
			• Stakeholder relationship building with Regulators and Government departments.
			• Key non-regulated pricing strategy:
			  • *Effective pricing will mitigate risks;*
			  • *Review current strategy; and*
			  • *Strategy to be dynamic, broad and inclusive.*

Productivity/ efficiency risk *Suboptimal productivity and efficiency levels* 7 7	• Ineffective value chain co-ordination • Ineffective rail and port planning • Asset availability and reliability concerns	• Lower volumes • Financial instability • Reduced asset performance • Adversely affecting service delivery levels	**Key control strategies** • Full implementation of Crew Management System in Freight Rail. • Develop Capacity vs Demand Model for Ports to address holistic operation. Review Port Development Framework Plans. • Improve and reinforce the TVCC co-ordination. • Initiate Port Operations Centres and develop into Joint Operations Centres. • Implement Regional Economic Integration Programme and MOUs to co-ordinate regional cargo flows. • Establish competent human resources capacity. • Develop comprehensive business continuity management plans to allay incidents and asset failures. • Embed a risk management culture in decision-making. • Integrated planning between Operating Divisions and industry for contingent capacity in the event of outages.
Operational readiness risk *Misalignment between operational readiness and rolling stock acquisition* 8 5	• Operations not ready to operate the newly acquired assets in terms of training of drivers and maintenance staff, upfront spares, tools and facilities • Alignment across the value chain between Operating Divisions and Specialist Units	• Delays in the deployment of newly acquired rolling stock • Reduced availability of rolling stock • Lower productivity	**Key control strategies** • Locomotive execution strategy – four-tier governance (Executive Sponsor, Steering Committee, locomotive owners, Programme Director). • 1 064 Locomotive Team to manage effectiveness of controls – Engineering and Freight Rail committees established. Group SteerCo not established yet. • Capital project planning between Engineering, Port Terminals and Rail Network for alignment across the value chain. • Operational readiness effected in preparation for locomotive deployment. • Ordering of railway material done a year in advance. • Programme Management office established. • Engineering and Freight Rail maintain risk registers.

Priority I risk – GCE and Board level
Priority II risk – Operating Divisions' CE level
Priority III risk – General Managers' level
Priority IV risk – Managers' level
Priority V risk – Employees' level

Residual risk
Inherent risk

Risk description	Root causes	Impact(s) on value	Key control strategies
ICT risk *Inadequate ICT infrastructure and technology to enable business and to deal with disruptive innovation* 6 9	• Organisation not ready to embrace disruptive technologies • Current ICT solutions not integrated • Funding constraints • Poor cybersecurity awareness among employees • Software vulnerabilities and lack of industry security standards in the new digital economy	• Business is not enabled to deal with disruptive innovation • Delayed implementation of new technologies • Reskilling of human resources required • Delayed commercialisation of digital solutions	**Key control strategies** • Effective implementation plans for the IT strategy. • IT systems convergence to improve visibility between Operating Divisions. • Strengthened perimeter protection with implementation of next generation firewalls. • Ramp up training before new assets in production. • Equipment lifecycle management. • Two-way ICT Disaster Recovery Plan. • Comprehensive security and tracking for critical systems. • Automation of software patches for servers and workstations. • Digital think tank established. • Implement systems automation strategies. • Evolving pre-emptive and proactive responses in response to the business needs through diagnostic capabilities, to deliver on advanced analytics.
People management risk *Inadequately skilled staff in operations, not skilled for future operations* 4 6	• Operational staff not skilled for future operations • Lack of scarce skills in the job market • Not actively managing skills development	• Delayed benefits realisation of new technologies • Retraining of current employees • Reliance on external skills	**Key control strategies** • Implement a compelling employer brand. • Workforce strategy to determine long-term and temporary skills requirements. • Cultivate skills development strategies, i.e. partnerships with educational institutions or programmes to supply scarce skills. • Vacancy management and displacement. • Initiate recruitment, talent and compensation strategies to attract scarce skills (i.e. rural areas, global). • Renegotiate main agreements with organised labour.
Capital execution risk *Not realising the benefits from the capital investments* 3 2	• Expected market demand not validated sufficiently • Lower economic activity both locally and internationally, leading to a lack of market demand • Delays in the execution of capital projects	• Not generating adequate cash flows to contribute to future capital expenditure • Underutilisation of newly acquired assets	**Key control strategies** • Implemented total cost of ownership planning techniques to ensure the best option when acquiring assets, using case validation and gate review process. • Fleet planning with the full asset lifecycle in mind. • Develop clear Replace/Repair/Refurbish guidelines. • Operational readiness monitored in execution through SteerCo, with focus on Mega-programmes. • Apply design to cost principles. • Robust demand validation process is now mandated for all strategic commodities. • Quarterly portfolio update and monitoring to assess changes in macroeconomic factors – to be considered in re-balancing the portfolio. • Developing assets with scalable and flexible solutions. • Capital Operating Model finalised. • Skills audit on 1 200 Project Management offices across the Group.

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External sources of risks

(aspects of legal, commercial, social, environmental and political contexts)

- Needs and interests of stakeholders
- Macro/microeconomic conditions
- Market forces, e.g. competitor strengths/weaknesses
- Environmental challenges

- Legislative and regulatory environment
- Political environment
- Market segmentation
- Market channels

Direct or indirect impacts of risks

Residual risk
Inherent risk

- Priority I risk – GCE and Board level
- Priority II risk – Operating Divisions' CE level
- Priority III risk – General Managers' level
- Priority IV risk – Managers' level
- Priority V risk – Employees' level

Residual risk profiles of the top 10 risk heat map: ● 2017 ○ 2016

Risk description	Root causes	Impact(s) on value	Key control strategies
Environmental risk *Energy supply, water shortage and adverse weather patterns* 10	• Absence of sufficient sub-stations along the network • Water shortage in certain geographical areas • Adverse weather patterns resulting in strong winds and torrential rain	• Operational disruptions • Handling of certain commodities adversely affected (i.e. sawdust at Port of Richards Bay) • Safety incidents: Loss of life and damage to equipment	**Key control strategies** • Setting of energy-efficiency targets, energy-saving initiatives and consumption reporting. • Electricity price path management, continuous price analysis. • Implement ISO 50001 for certification planned for 2018. • Water policy. • Water-retention initiatives – leak detectors, pressure control values, remote loggers. • Refurbish Delkor Plant, boreholes. • Agreement with CSIR to obtain weather updates.
Macroeconomic environment risk *Deterioration in macroeconomic environment due to global economic slowdown and slow recovery, rendering capital projects non-viable* 1 3	• Global economic slowdown and concomitant slow recovery • Local economic policy uncertainty • Weakening of local currency	• Capital projects becoming non-viable • Increased cost for the replacement of current assets and acquisition of spares • Possible Sovereign credit rating downgrades	**Key control strategies** • Treasury Financial Risk Management Framework. • Adopt Long-term Planning Framework. • Strategic customer engagement plans. • Annual Corporate Plan and budgeting. • Flexibility to adjust Corporate Plan and investment strategy to operations. • Capital reprioritisation.
Regulatory risk *Changes in the regulatory environment* – spending on capex based on assumptions that may be negatively impacted by subsequent changes in regulation* 9 8	• National policy changes anticipated in economic regulation • National Treasury increasing procurement controls to contain uneconomical spend and opportunities for fraud	• Spending on capex based on assumptions may be negatively impacted by subsequent changes in regulation • Compliance requirements becoming more onerous • Local policy uncertainty	**Key control strategies** • Regular engagement with Government and Regulators to align strategies. • Assessing draft legislation through communication and consolidation of impacts on internal processes. • Shareholder Task Team built to engage with the Rail Regulator. • Developed and maintained minimum control frameworks in response to procurement legislation. • Assurance activities on priority legislation for control effectiveness. • Competition Commission investigation – prepare the required documentation to inform on alleged port and rail exclusionary practices and price discrimination.
Volume growth risk *Inability to attract and sustain additional volumes with new capacity Protecting current volumes against new entrants, customer activism* 10 4	• High reserve stock levels of some commodities • Current customers in financial distress • Pricing not integrated across the organisation • Inflexible in pricing strategies, do not compete with rivals in new markets	• Not meeting planned revenue diversification opportunities • Stranding and underutilisation of newly acquired assets • Reduced volumes from current customers	**Key control strategies** • GLT diversification initiatives. • Think tank initiatives. • Strategic customer engagement plans. • Group integrated pricing forum. • Key account management. • Approved pricing strategy. • Road-to-rail strategy.

* *i.e. economic, technical and compliance.*

Risks taken outside tolerance levels

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Desired control effectiveness is assessed by risk sponsors, assuming that all additional mitigation has become effective. The level of desired control effectiveness is based on various considerations, including the extent to which the Company can control the root causes, consequences and the likelihood of the risk materialising.

The Company also performs a cost benefit analysis when assessing the scope for further control and risk treatment. The risk sponsors consider closing the gap (if any) between the actual control effectiveness and the desired control effectiveness when deciding on risk response strategies.

The top five residual risks are tolerated for being outside the generic tolerance levels. This is largely due to the influence of external factors on these risks.

The governance of risk

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Accountability is key in the management of risks – named individuals will be associated with specific risks, controls or tasks. The primary risk roles are:

- Risk owners: ensure that the assessment of that risk is up to date and is properly recorded in risk registers;
- Control owners: provide periodic assurance that controls are adequate, effective and efficient; and
- Task owners: take risk treatment actions.

Transnet's risk control and assurance environment

Integrated Assurance Model for capital projects programmes

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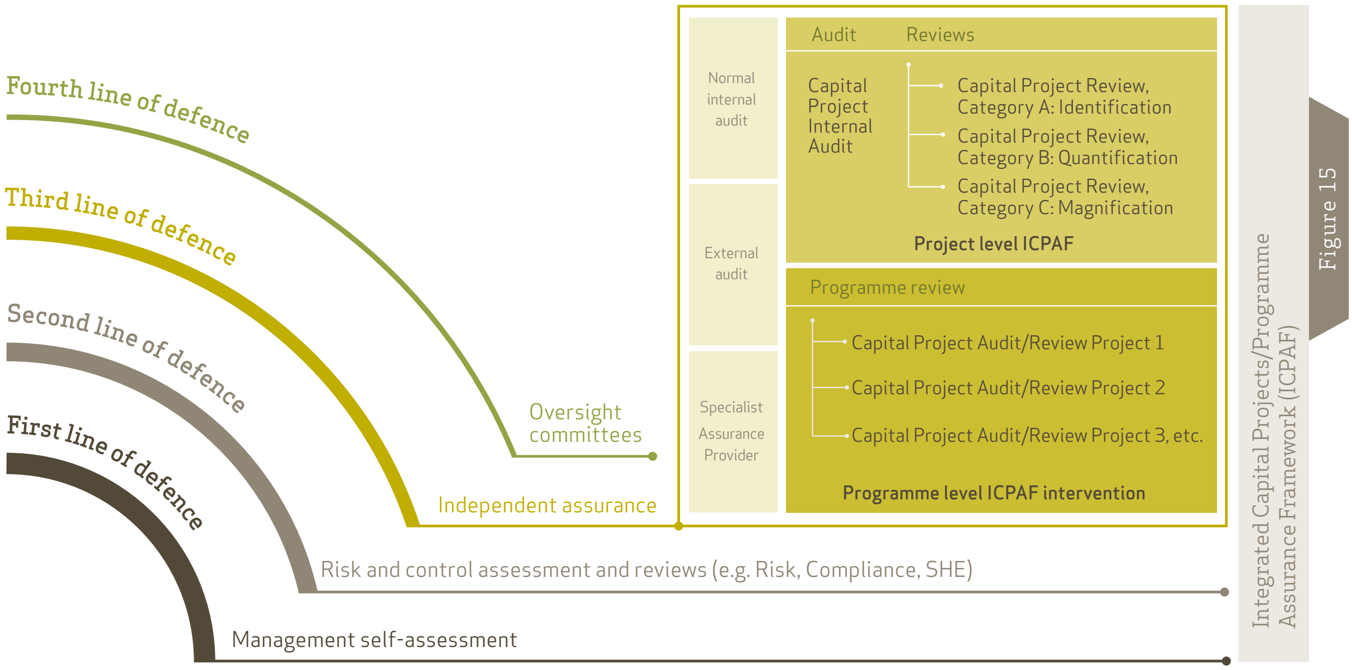
Transnet has an established, principles-based Integrated Assurance Model (IAM) that provides a clearly defined, documented approach for integrating and aligning Transnet's assurance processes and control systems thereby, enabling appropriate risk and governance oversight.

Integrated Assurance Model for capital programmes



Management of risk

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During 2007, Transnet introduced one framework for the management of all risks across the business. While the framework is now established, we continue to consolidate and embed Enterprise Risk Management (ERM) activity across the organisation.

ERM aims to achieve an appropriate balance between opportunities realised for gain, while minimising adverse impacts. The general activities in a formal ERM process include risk identification, evaluation, prioritisation, treatment, monitoring, reporting and integration into strategic decision-making and key business processes.

The emergence of generally accepted corporate governance principles has seen risk management focus increasingly on Transnet's strategic objectives. Rather than striving only for inherent efficiencies and operational performance, ERM helps to shape the business' strategic direction. The risk management approach is evolving from being process- and compliance-focused, to one of data-centricity.

To achieve best-practice levels, Transnet considers the requirements of the guidelines of the King Report on Corporate Governance for South Africa, 2017 (King IV), and ISO 31000: 2009 Risk Management Standard. The strategic risk profile is based on the five strategic imperatives of the MDS and the nine Sustainable Developmental Outcomes (SDOs):

- Financial sustainability;
- Capacity creation;
- Operational performance; and
- Market segment competitiveness.

Fraud and Corruption Risk Management Strategy

Transnet's Fraud and Corruption Risk Management Strategy, as contained in the Fraud Risk Management Programme (FRMP), provides mechanisms for the prevention, early detection and investigation of irregularities. The FRMP also provides corrective measures to address control breakdowns and the related root causes from a fraud and/or corruption perspective.

The MDS strategic imperatives and SDOs represent the overarching themes of the FRMP in that they not only embrace the fraud risk management initiatives undertaken in previous years, but also emphasise the related root causes of fraud and corruption emanating from the areas of governance, people, methods and practices. Further, the successful implementation of the various initiatives contained within the identified themes will continue to assist Transnet in positioning itself as a leading company with a robust fraud and corruption risk management strategy.

Figure 16

Key themes of the Fraud and Corruption Risk Management Strategy

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- **Financial sustainability**
  - Forensic data analytics
  - Revenue generation
- **Capacity creation**
  - Capital programmes
  - Anti-corruption Compliance Programme
- **Operational performance**
  - Tone at the top
  - Asset management
  - Forensic data analytics
  - Time and attendance
  - Fraud and corruption risk assessments
- **Sustainable Developmental Outcomes**
  - Recruitment and selection
  - Fraud and corruption awareness
  - Whistle-blowing mechanism
  - Ethics compliance programme
  - Legislative compliance
- **Market segment competitiveness**
  - Tender management
  - Contract management
  - Three-quote process

Emerging risks

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The following emerging risks were identified over the past financial year and are receiving appropriate attention:

Short-term to medium-term emerging risks

Update at the time of writing this report

Emerging financial risk – Sovereign credit downgrade: The risk of obtaining a negative Sovereign credit rating impacts Transnet's investment appeal. Transnet's rating is linked to that of the Sovereign.

At the time of writing this report (as at 5 April 2017), Standard & Poor's had lowered the Company's foreign currency rating to BB+ from BBB- and the local currency to BBB- from BBB, both with a negative outlook. On 13 June 2017, Moody's also lowered the Company's rating to Baa3 with a negative outlook. Both these actions were due to the rating action on the Sovereign as Transnet is viewed to be closely linked to the Government. Transnet evaluated the potential impact on its financial position, liquidity and solvency and expects no significant negative effect on estimates.

- **Emerging operational risks** – Extreme weather conditions, such as flash floods, lead to washaways and mudslides on major routes which increase the severity of rail safety-related incidents, which could result in derailments, asset losses and even employee fatalities. An agreement was reached with the CSIR to share weather updates with Transnet as an early warning of expected adverse weather conditions. The Company also employs activity-based risk assessments to determine unsafe conditions in operations.

- **Emerging ICT risks** – New technologies have the potential to drive innovation, new opportunities and create value, while they also have potential to negatively impact society and the business environment if skills are not sufficient to adopt and implement these technologies. It is imperative for South Africa to develop skills capacity for emerging technologies.

Long-term emerging risk environment

A transition in the global economy is under way. The emergence of disruptive technology fuelling the 4th Industrial Revolution, driven by extreme automation and artificial intelligence, is already changing business globally. The social system also is experiencing disruptions in power dynamics as evidenced by increasing social activism campaigns across the world (e.g. Arab Spring, Keystone XL, #feesmustfall), all enabled by digital platforms. South Africa has experienced a significant deterioration of its electricity security situation over the past 10 years and, increasingly, decision-makers are realising that biodiversity loss is not a second-order issue but is intricately linked to economic development, food challenges and water security. Transnet's emerging risk landscape holds both challenges and opportunities for growth.

Circular economy – decoupling of economic progress from resource utilisation

Transitioning from the current global industrial economy towards a circular economy necessitates that we continue to adapt and evolve Transnet's business model to remain fit for purpose. Moving forward in the medium term, Transnet could expect a reduction in the transportation of certain mining commodities within the domestic market (e.g. coal) as a direct result of the reduced need for energy per unit of output, and the move to cleaner energy. There are likely limits to growth on Transnet's iron ore export line in the medium to long term, and demand is even likely to follow a pessimistic outlook in an increasingly 'sustainable world'. The flow of manufactured goods by rail will be negatively impacted where such goods can be manufactured at the point of use, particularly using 3D printing. Such technologies may also displace Advanced Manufacturing's work in the medium to long term, as organisations shift to their own manufacturing.

Transnet has already begun to adapt its business model and operational structure in earnest to meet this new industrial paradigm, with due consideration for the opportunities and major risk areas presented by the future business landscape as summarised below:

- Disruptive technology
- Energy
- Water
- Biodiversity
- Social inequality

Disruptive technology

'Disruptive' technology is known to displace or discontinue an established or sustaining technology and shake up an industry. It can also be a groundbreaking product that creates a completely new industry. Transnet can create new and innovative technologies to adapt to the 4th Industrial Revolution paradigm or, conversely, have aspects of its business displaced by external disruptive technological innovations. Disruptive technology can be good and bad depending on response.

Disruptive technology has not yet displaced any aspects of Transnet's business. However, if left to chance and 'business as usual', Transnet may find it difficult to be competitive in the next decade. Transnet is an energy-intensive company with ownership in the country's freight rail, ports and pipeline infrastructure. The development of technologies, such as Internet of Things, fuel cells, drones, driverless cars, renewable energy and energy storage system, will have consequences for Transnet's business model. It is thus paramount to understand this impact and how it will evolve. Agility, speed and investment in emerging technologies will be crucial for Transnet to succeed as beneficiaries in this rapidly changing developmental revolution.

In the medium term, driverless vehicles may impact Transnet as road transport may be favoured over rail based on the efficiencies that driverless technology will bring. This can have an impact on volumes, especially in General Freight. In the long term, it is expected that driverless technology would have displaced the traditional mode of transportation.

Energy

The current global energy system is based on fossil fuels and this will change in future as the global economy is shifting towards cleaner fuels. Social inclusion by providing access of energy to all will be critical as the energy system transforms.

Demand for coal transportation by Transnet for Eskom power generation is unlikely to be affected in the short to medium term, as South Africa is locked into coal-powered generation, but it is likely to be affected negatively in the longer term. Coal exports could be affected negatively before 2020. If South Africa opts to import LNG, this is unlikely to happen much before 2020, but it does present a new opportunity for Transnet to off load and distribute the gas throughout the country.

Electricity security is expected to have an impact on all SDOs over Transnet's long-term planning period. Industrial capability building and investment are already being impacted for the immediate term due to the energy security risk. Electricity security is critical to Transnet to remain a going concern, although no material business disruption has yet been reported.

Water

Water stress is expected to amplify over the next decade and further if governments, businesses and civil society do not implement mitigation measures. There is a high probability of an increased volatility to catchments and subsequent impact on dam levels. Regionally, the Kariba Dam, which feeds Zimbabwe and Zambia, is currently at 14%, which is an extremely dangerously low level. This will have a ripple effect on Zambia's energy sector as it is 95% reliant on hydro power. With global population expected to exceed the 9 billion mark by 2050[1], more strain is expected on the global water system.

In the business operation water stress has already been experienced. The uMhlathuze Municipality has been imposing restrictions since 2014 and continued through 2016. Water at the Port of Richards Bay terminal is used for dust suppression, washing conveyor belts and sanitation and hygiene. Although there are alternatives to using water for dust suppression, this comes at a cost premium and subsequent increase in the cost of operations. Having adequate water for sanitation and hygiene is critical to ensure the health of employees and is a basic requirement for a workplace as shortages can increase the level of absenteeism due to ill health. Absenteeism can have an impact on operational efficiencies and thus impact costs and revenues.

Transnet has a percentage of the market share in the transportation of maize and thus this may have an impact on the business in the short to medium term. Further, having a large percentage of market share of coal transportation, the impact on volumes is inevitable, not only due to emission reduction pressures, but also owing to the difficulty in obtaining water use licences for mining. The prioritisation of allocations for water will be of fundamental importance in terms of industrial versus domestic water needs.

While it is a challenge, water risk also presents an immediate opportunity in the business operation from an import perspective. South Africa may need to import up to half of its maize requirements over the course of 2016 and beyond. Five of our ports have grain handling facilities with substantial storage capacity to handle the growth in volumes. The Port of Durban is geared up to act as the importation hub for maize.

[1] *http://www.un.org/esa/population/publications/wpp2008/pressrelease.pdf*

Biodiversity

Biodiversity loss presents many more risks to Transnet's value network, value chain and business operations. In the medium and long term, future corridors are at risk due to population increase, and human settlement along those corridors. De-ballasting remains a challenge at the ports and poses a risk of alien invasion. This can have a great impact on the marine environment and can greatly impact aquatic life. An increased difficulty in obtaining licences (Water Use Licences and tree-cutting permits) resulting in payment of standing time and possible deviations is expected throughout the MDS and LTPF – this is a cost to the business. This would be due to increasing stringency in conservation laws and Government's drive towards sustainability.

Social inequality

Social inequality has been widening throughout many economies. This has a potential to erode social contracts between states. Transnet has a development agenda to support economic growth and job creation. It operates across South Africa and has a regional agenda. The Company is susceptible to societal risks to gain a licence to operate. There will be growing expectations from societies for Transnet to be inclusive in its development and to collaborate. Community unrest may emerge due to Transnet's inability to meet community expectations.