



Ministry of Foreign Affairs

SECTOR STUDY: LOGISTICS - SOUTH AFRICA

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International.



SECTOR STUDY: LOGISTICS

Final Report

30 March 2020

Executive Summary

The South African logistics sector supports the second-largest economy on the continent, and is relatively sophisticated. Local and international companies use South Africa as gateway for their operations into Africa. However, under-investment in maintenance and infrastructure development has created challenges for the efficiency of the logistics system. While hampering efficiency, this aspect at the same time presents opportunity for improvement and investment.

This document summarises the results of an investigation into opportunities for Dutch companies to do business in South Africa. It is based on a review of knowledge of the sector, as well as interviews with Dutch and South African stakeholders. The study focused on industry-level interviews to gain the best possible perspective within the scope and time frame of the project. While it does not outline firm-to-firm opportunities, the study summarises needs in the logistics sector as expressed by South African stakeholders, as well as opportunities or current initiatives identified by Dutch role players.

Some key findings are as follows:

- South Africa's logistics landscape is the most sophisticated on the continent. However, logistics takes place in an environment of neglected maintenance and accompanying infrastructure degradation, and relatively high logistics costs. This inefficient environment provides inherent opportunities for improvement and optimisation.
- At present, many organisations in South Africa do not have the skills to utilise digital technologies effectively. This represents a significant opportunity for digital skills development and knowledge transfer regarding the benefits of these technologies across the logistics sector. This could include pilot projects and benchmarking exercises as proofs of concept.
- The opportunity exists for collaboration in infrastructure development projects, and for innovation for operational efficiency improvements. The objective is optimal efficiency of an adequately-capacitated internal logistics infrastructure system. Problems are recognised, and some initiatives are in progress to alleviate inefficiencies and constraints.
- Selected sector-specific initiatives are underway to resolve operational inefficiencies collaboratively (e.g., the Flying Swans initiative in the fruit sector, and port renewal initiatives). Opportunities exist to learn from and expand these collaborations to other sectors. Solutions are required across the board to reduce the overall cost of logistics for increased competitiveness.
- South African interviewees have almost across the board indicated their interest and willingness to collaborate with Dutch partners in the sector.

Dutch and South African study participants identified matching interests and needs (see summary table on the next page), which could be explored in the interest of the development of the South African logistics sector, and to the benefit of Dutch stakeholders.

Focus areas include skills development, infrastructure development, pilot development projects, logistics channel development, and research, innovation, and technology development.

Existing successful collaborations provide a basis from which to build future engagements.

















	Focus area		SA participants: opportunity identified		Dutch participants: initiatives proposed or in progress	
forward-looking	Technology adoption & advisory	Define and identify relevant logistics innovations Internationalisation of innovation SMME stimulation Collaborative research	Technology introduction and adoption (drones, blockchain, AI, robotics) Technology opportunity diffusion to entrepreneurs Technology for resource-constrained environments		Sustainable logistics (green, circular economy) Data-driven logistics ICT platforms: supply chain coordination & data sharing Alternative truck configurations: ecological impact	
					Collaborative programmes between Dutch and South African universities for service and business logistics	
logistics management & operations	Trade, investment	Trade development & investment facilitation			Facilitate investment / trade visits for SA economic development zones Trade participation for Dutch logistics companies	
	Logistics channel development	Commercial logistics export/import service provision (end-to-end)			For large Dutch logistics service providers: Increased appetite for SA imports (fruit, wine, electronics, pet food, etc.)	
		Niche service providers			Smaller consultancies to provide niche services	
	Logistics management	Pharmaceuticals			Knowledge sharing for chain management	
		ICTs for supply chain coordination & customs			Knowledge & expertise for lobbying and collaboration - digitised information sharing	
		Asset management			Collaboration for improved asset management, spares availability on infrastructure projects	
	 Collaboration & coordination	Sector-wide strategy development	From intent to implementation (e.g., road to rail initiative)			
		Efficient operations	Improved port operations, supply chain efficiency & agility			
	 capacity development	Infrastructure revitalisation	Ports & airports	Ports efficiency for improved export capacity		Foreign advisory and knowledge sharing Airports as hubs into Africa
			Road to rail			Share knowledge & expertise for intermodal solutions
Efficient use			Warehouse management systems		Intelligent traffic systems Warehouse management systems	
Investment			international investment guidance		Prioritisation of investment	
in general			More sophisticated and more mature infrastructure			
Skills development		Technology adoption	Partnerships for 4IR capacity development Simulators (e.g., for train driver)			
		Work readiness	Bridge the gap between education and work environment			
		Firm- and subsector-specific initiatives, in collaboration with local education partners	Develop emerging service providers in specific sectors (maritime, etc.)		Leadership development exchange programmes (supply chain and logistics, international trade) Development of university modules in warehouse operations and management, maritime	
Pilot initiatives		Development of emerging logistics service providers	Informal supply chain development (e.g., spaza retailing) Develop emerging logistics service providers		Parcel deliveries by taxi companies	

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1. Introduction

South Africa is the gateway to Africa, with many South African companies extending their reach across the continent for increased growth and sustainability. The logistics infrastructure is sophisticated relative to that of many African counterparts. However, a lack of maintenance and infrastructure investment with a resultant shift from rail to road, as well as congested and inefficient ports, leaves significant opportunity for innovation and improvement. Government's recent shift towards investment in infrastructure development underlines this opportunity. Further, the private sector is eager to adopt new technological advancements to ensure competitiveness and growth.

This report was commissioned by the Economic Department of the Consulate General of the Netherlands in South Africa, with the aim of exploring business opportunities for Dutch companies in South Africa. It combines Gain Group's understanding of the logistics landscape, existing research, and interviews with Dutch and South African stakeholders to present an overview of the South African logistics sector.

The report summarises the research approach (Section 2), and provides an overview of the South African logistics landscape and industry trends by way of context (Sections 3 and 4). Dutch and South African stakeholder perspectives, as gained from interviews, are summarised in Sections 5 and 6, and the opportunity landscape is presented in Section 7. A brief summary is provided in Section 8.

2. Research approach

2.1 Objective

The study intends to provide potential investors with an overview of the South African logistics sector, including the opportunities and challenges for investment in this sector.

The study aims to answer the following questions:

Main question:

What opportunities are present and most relevant for Dutch business in the logistics sector in South Africa?

Sub-questions:

- *What are the current strengths and weaknesses of the South African logistics sector?*
- *What opportunities are present in the logistics sector? Which ones are relevant for Dutch businesses? Opportunities are sought in both services (incl. on smart supply chain management) and goods.*
- *Who are the relevant stakeholders/partners for Dutch businesses with regard to these opportunities?*
- *What are the potential barriers with regard to these opportunities?*



Figure 2.1 Research overview

2.2 Scope and definition

The study considered the South African freight logistics sector in its entirety, but with emphasis on sub-sectors with higher freight transport volumes.

The framework that was used to select participants and describe the sector comprised the following elements:

Element of freight logistics system	Description
Transport modes	<ul style="list-style-type: none">• Road, rail, maritime, air
Infrastructure	<ul style="list-style-type: none">• Road, rail, ports, airports
Service providers	<ul style="list-style-type: none">• Private and public sector• 2PL, 3PL, 4PL providers• Training providers
Freight owners	<ul style="list-style-type: none">• Focus on large-volume sectors
Research/ Innovation / Knowledge sharing	<ul style="list-style-type: none">• New developments that are influencing any elements of the system

Table 2.1 Elements of the freight logistics system

The research questions were answered through a document review and key stakeholder interviews, and by incorporating the insights that Gain Group have developed of the logistics sector through ongoing research. The scope of the research activities are summarised below.

2.3 Document overview

The document review provided insights into Dutch services and technology developments, as well as into South African opportunities, challenges, and current initiatives that drive the status of the sector. The information sources are summarised in Table 2.2.

Table 2.2 Structure of literature review

Literature	Purpose
Dutch logistics offering	Current developments, including: <ul style="list-style-type: none"> • Key players • Existing collaborations
South African logistics sector	Current status, including: <ul style="list-style-type: none"> • Key players • Strengths and weaknesses • Challenges • Current focus areas and existing collaborations • Future focus areas

The documents mainly included popular online information (as opposed to academic documents), as well as reports on current initiatives, as referred by interviewees.

2.4 Semi-structured interviews

Interviews in the South African sector were conducted at the level of industry bodies rather than individual firms, so as to obtain the best possible overview within the limited scope of the study. A convenience sample of interviewees was selected according to the framework outlined in Section 2.2. Nine South African stakeholder organisations were interviewed, engaging sixteen participants.

Participants from the Dutch logistics sector were based on individual referrals, and included players who have experience with investment in the South African economy or trade with South African companies. Five interviews were conducted with Dutch participants.

The following types of organisations participated:

Table 2.3 Study participants

	South African participants (number of employees in brackets)	Dutch participants
Freight owners	Road freight (1) Agriculture (3)	
Service providers	Freight Forwarders (2) Supply chain management (2) Education and training (transport) (3) Rail operations (1) Freight forwarding and logistics (1)	Body or logistics service providers (1) Service logistics provider (1) Transport and logistics provider (1)
Infrastructure owners	Rail infrastructure (2)	
Research/ innovation/ knowledge sharing	Freight transport journalist (1)	Logistics knowledge and innovation partner
Other		Small business investment advisor (1)

3. The logistics landscape

3.1 Sector overview

South Africa has a transport-intensive economy, resulting from the combined effect of a number of factors: the geographic spread of the country; the interior location of the main economic hub (Gauteng), which developed around the gold mines and is approximately 600 km from the nearest port; the dependence on high-value imported consumer goods; the distribution of agricultural and manufactured goods from production areas to economic centres; and the export of bulk commodities (coal, iron ore, and manganese) from inland mines. Seven of the ten most competitive sectors are heavily dependent on transport. These are mining; automotive; steel and other metals; FMCG; agribusiness; building, construction and engineering; and retail. However, the transport and logistics sector ranked the second least competitive out of the country's 16 economic sectors (Barloworld Logistics, 2012). This has a negative impact on the competitiveness of the aforementioned sectors and therefore on the South African economy. Figure 3.1 shows the size of South Africa relative to that of Western Europe, so as to facilitate comparison and outline the context within which the sector operates.



Figure 3.1 Surface area: South Africa superimposed on Western Europe

The World Bank Logistics Performance Index (LPI) ranks South Africa in the 33rd position out of 160 countries in 2018, down from the 20th position out of 167 countries in 2016. Comparatively, the Netherlands was ranked 6th in 2018 and 4th in 2016. The LPI uses six indicators to measure a country's performance, namely, customs, infrastructure, international shipments, logistics quality and competence, tracking and tracing, and timeliness. South Africa has been the top performing African country since the inception of the LPI in 2007, with Kenya (42nd position) and Cote d'Ivoire (50th position) ranked second best in 2016 and 2018, respectively (Arvis et al, 2018; Ittmann, 2018). South Africa is considered as the gateway to sub-Saharan Africa.

South Africa has been measuring logistics costs as a percentage of GDP for more than a decade. In 2016, the logistics cost was 11.8% of GDP and 56% of transportable GDP, representing an increase from 11.2% and 51.5%, respectively, in 2014 (Havenga et al., 2016). The logistics costs as a percentage of GDP for various countries, as calculated in 2018 by Armstrong & Associates (2020), together with their 2018

2018 Top ten LPI scores vs SA

Country	LPI
Germany	4.20
Sweden	4.05
Belgium	4.04
Austria	4.03
Japan	4.03
Netherlands	4.02
Singapore	4.00
Denmark	3.99
UK	3.99
Finland	3.97
South Africa	3.38

LPI scores (World Bank, 2018), are shown in Figure 3.2. South Africa's logistics cost is much higher than that of developed countries, but significantly lower than that of the BRICS countries.

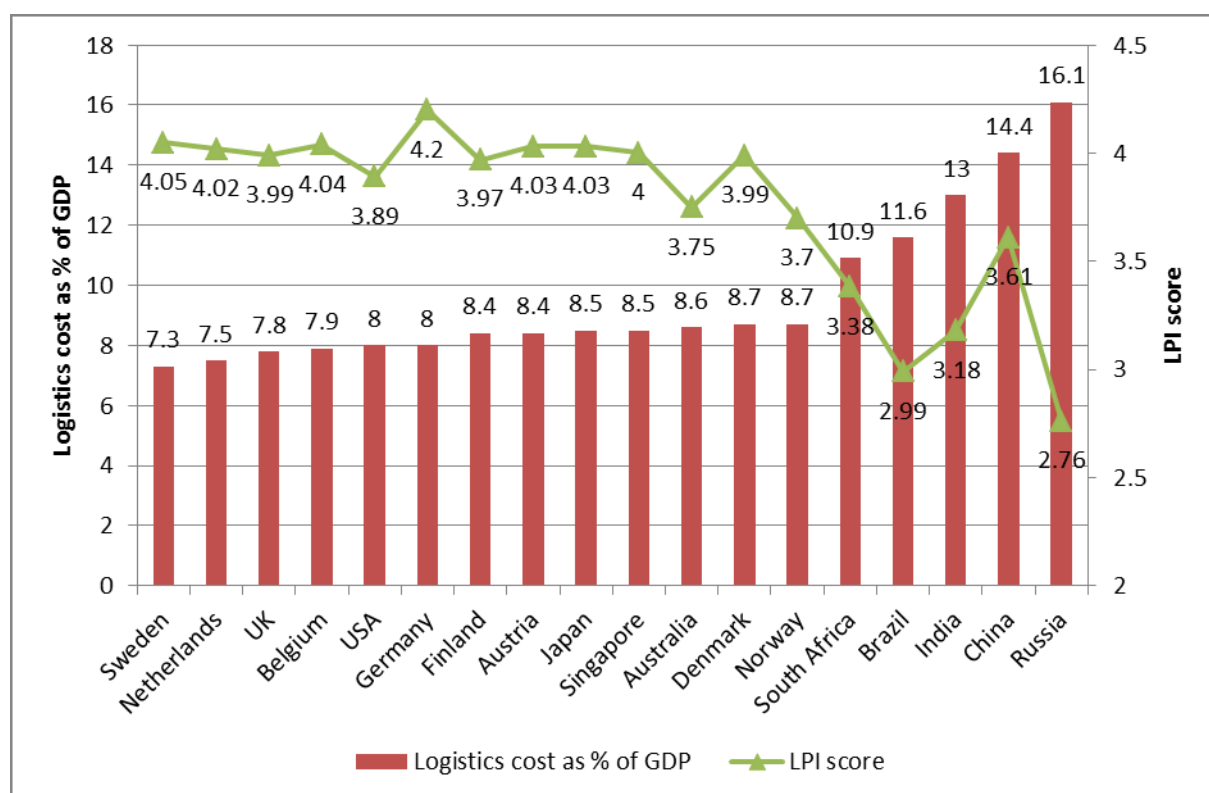


Figure 3.2 Logistics cost and LPI score comparison (compiled by authors from Armstrong & Associates Inc, 2020 (2018 data) and World Bank, 2018)

In addition to the above indicators, the value of the logistics industry can also be reflected by its total turnover. In 2018, the total turnover for the logistics industry (limited to companies only involved in mining, retail and manufacturing) was estimated at R274 billion. As warehousing and transport are often not classified as logistics, but included under retail or manufacturing, the turnover of the entire logistics sector is believed to be close to R480 billion (Businesstech, 2019).

3.2 Logistics infrastructure

South Africa has the most extensive transport infrastructure network on the African continent, including approximately 750 000 km roads, approximately 30 000 km rail tracks of which 20 900 km are route kilometres, eight commercial ports, and eleven principal airports (Department of Transport, 2016 & 2020; Transnet, 2017). Figure 3.3 provides an overview of the infrastructure network, while Figure 3.4 outlines the rail network in more detail. Approximately 7500 km of the rail network are classified as branch lines, which serve as important links to rural areas. The branch line network consists of a combination of active, closed, lifted, and stolen lines (Transnet, 2017). Figure 3.5 shows the active and closed branch lines.

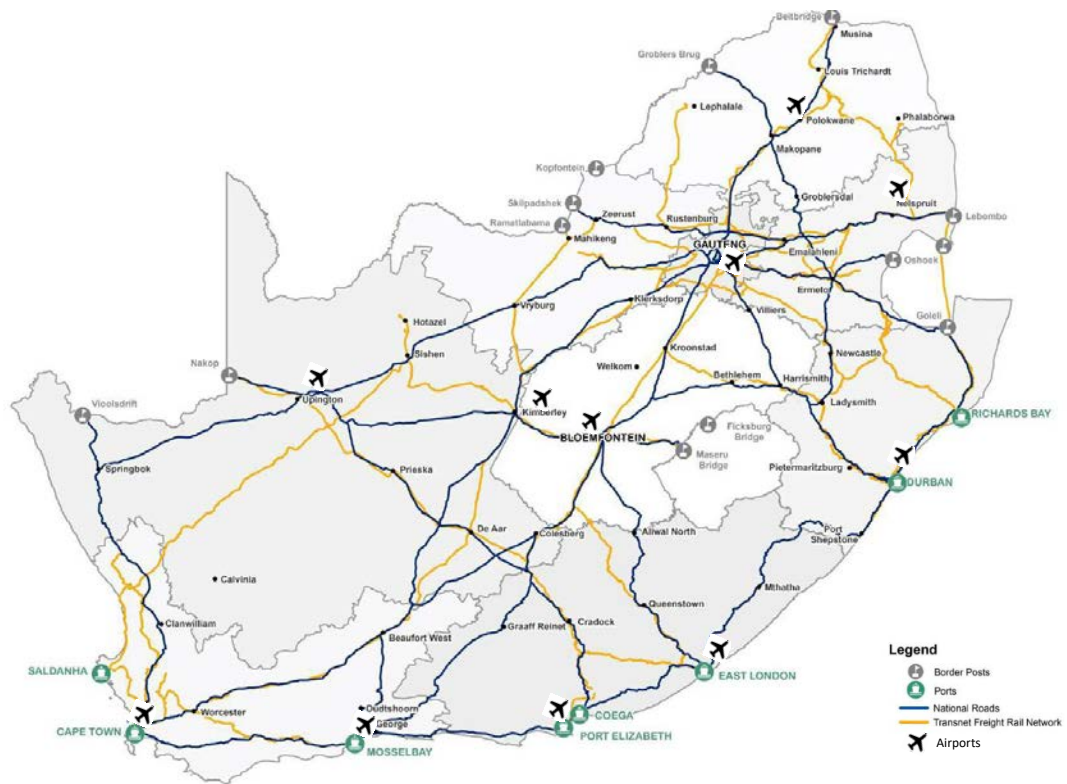


Figure 3.3 Overview of transport infrastructure (Department of Transport, 2016)

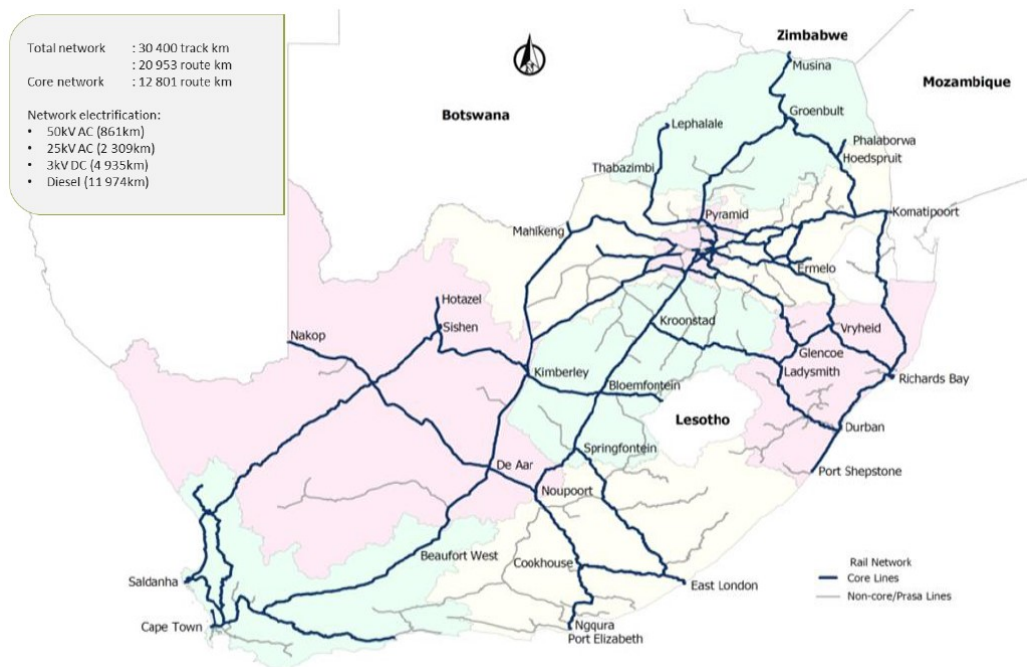


Figure 3.4 Overview of rail network (Transnet, 2017)

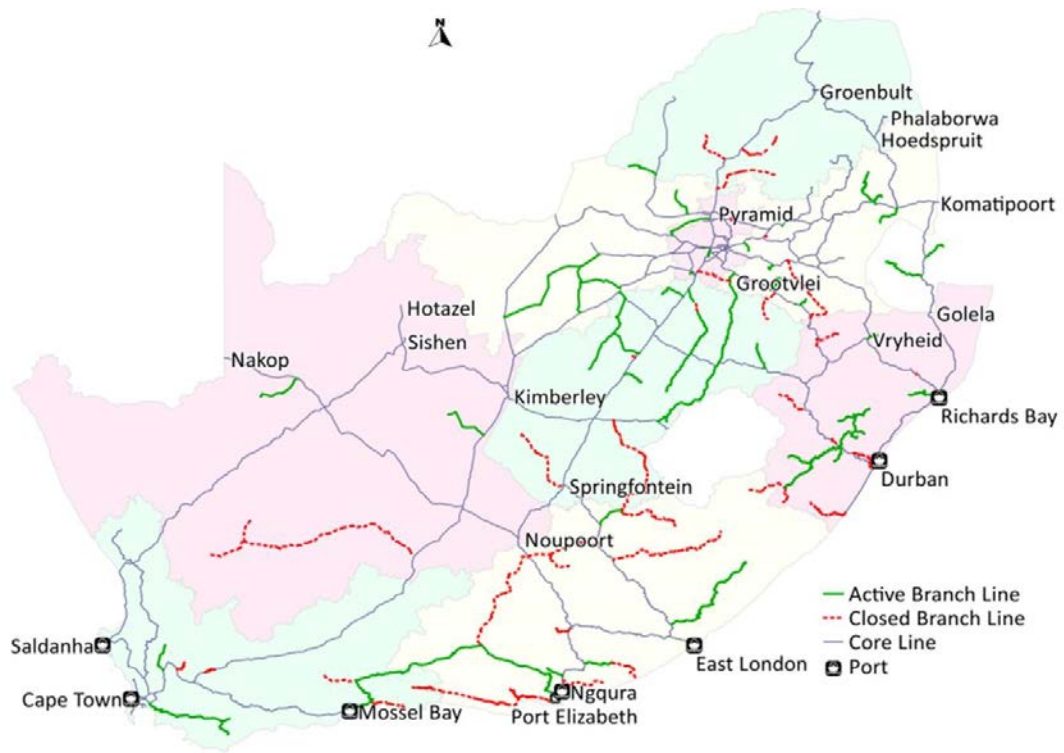


Figure 3.5 Overview of branch lines (Transnet, 2017)

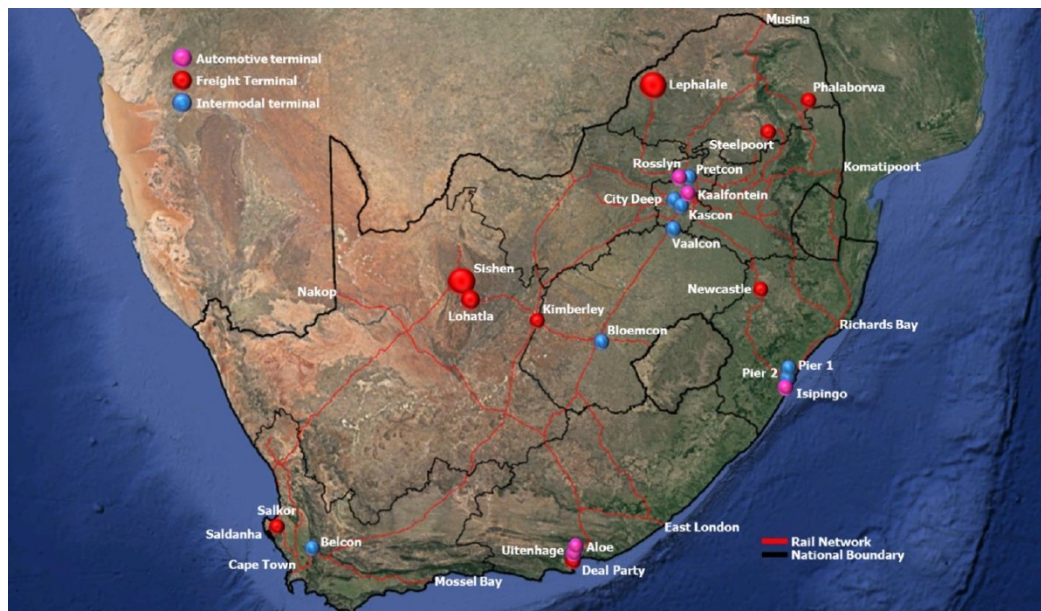


Figure 3.6 Rail terminals (LTPF, 2017)

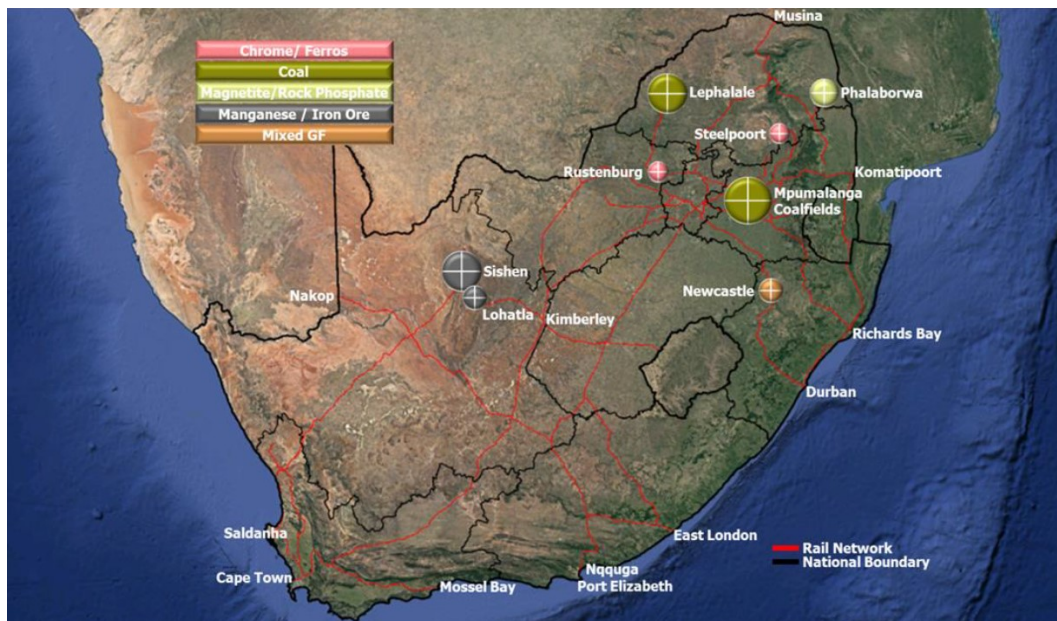


Figure 3.7 General freight rail terminals (LTPF, 2017)

Figure 3.6 shows the locations of the intermodal (container), automotive, and general freight rail terminals. At some of the intermodal terminals, the volumes have declined and a few are dormant. General freight terminals are small terminals used for repackaging commodities or loading and offloading facilities inland and at the ports, respectively, for the export of bulk minerals. The larger general freight terminals (Figure 3.7) are loading terminals located close to the Mpumalanga coal fields, the Phalaborwa chrome area, and the Sishen manganese and iron ore area.

The National Department of Transport (NDoT) is responsible for developing the policies and legislation to govern roads, railways, ports, airports, pipelines, as well as intermodal operations of freight and public transport. The South African National Roads Agency Limited (SANRAL) is responsible for the financing, design, maintenance, rehabilitation, and upgrading of the national toll and non-toll roads, while the provincial transport departments are responsible for approximately 49 000 km of the paved road network. As 77.3% of land freight is transported on roads, it negatively impacts on the condition and maintenance requirements of the roads (South African Government, 2020c).

The Airports Company of South Africa (ACSA) owns and operates nine principal airports, while the Kruger Mpumalanga International airport is privately owned and the Polokwane International Airport is managed by the Gateway Airports Authority of the Limpopo Provincial Government.

Public entities under the National Department of Transport

- South African National Roads Agency Ltd (SANRAL)
- Road Traffic Management Corporation (RTMC)
- Road Traffic Infringement Agency (RTIA)
- Road Accident Fund (RAF)
- Cross-Border Road Transport Agency (CBRTA)
- Railway Safety Regulator (RSR)
- Passenger Rail Agency of South Africa (PRASA)
- Ports Regulator of South Africa.
- South African Maritime Safety Authority (SAMSA)
- Airports Company South Africa (ACSA)
- Air Traffic and Navigation Services (ATNS)
- South African Civil Aviation Authority (SACAA)

Source: South African Government, 2020c

Transnet is responsible for providing rail, port, and pipeline infrastructure. It is a State-Owned Company that reports to the Department of Public Enterprises.

Eight commercial ports are managed by the Transnet National Ports Authority (TNPA) in a landlord capacity in terms of the National Ports Act.

The ports have been grouped into regions, with Saldanha Bay, Cape Town, and Mossel Bay representing the western ports, Port Elizabeth, Ngqura (Coega), and East London the central ports, and Durban and Richards Bay the eastern ports. The TNPA is responsible for the port infrastructure and marine services at these ports. The ports are connected to their hinterlands by road and rail. Rail infrastructure within the port boundaries, such as rail lines, yards, and terminals, is typically owned by TNPA and operated by Transnet Freight Rail (TFR). The majority of the terminals are operated by Transnet Port Terminals (TPT) on a commo-user basis (Department of Transport, 2016; Transnet, 2020; Transnet Port Terminals, 2020).

Airports under ACSA

- O.R. Tambo International (Johannesburg)
- Cape Town International
- King Shaka International (Durban)
- Bram Fischer International (Bloemfontein)
- Port Elizabeth International
- Upington International
- East London Airport
- George Airport
- Kimberley Airport

Source: ACSA, 2020

Transnet Group Commercial (TGC) is responsible for Private Sector Participation (PSP) projects. See Appendix E for examples of upcoming tenders and infrastructure projects.

A more detailed description of the transport and logistics infrastructure can be found in GAIN and Frontier Analysis (2014).

3.3 Freight flows

The freight flows on the national network are depicted below. Figure 3.8 summarises road and rail volumes and projected growth (in millions of tons) on the major corridors.

A summary of all cargo handled at South African ports is given in Table 3.1, highlighting the Port of Durban as the busiest in terms of numbers of containers handled, followed by the Ports of Cape Town and Ngqura.

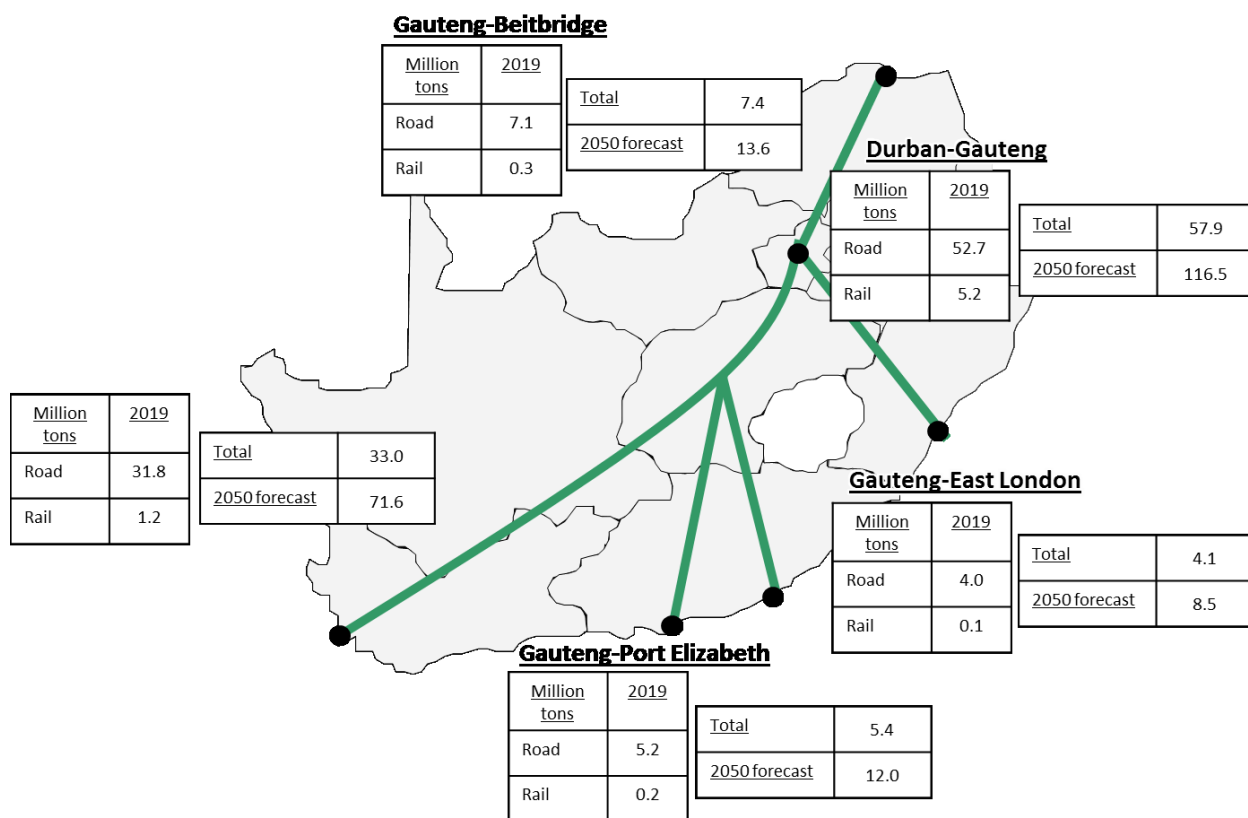


Figure 3.8 Freight flows: projected growth (Source: GAIN Group)

Table 3.1 Cargo volumes handled at South African ports in 2019 (TNPA, 2020)

SUMMARY OF CARGO HANDLED AT SOUTH AFRICAN PORTS (JANUARY - DECEMBER 2019)									
	Richards Bay	Durban	East London	Ngqura	Port Elizabeth	Mossel Bay	Cape Town	Saldanha	Total
DRY BULK CARGO (METRIC TONS)									
Dry bulk landed	4 736 216	4 492 808	67 442	167 963	172 871		1 302 310	1 053 754	11 993 364
Dry bulk shipped	90 012 075	6 960 774		1 634 791	9 456 253		215 529	65 411 858	173 691 281
Transshipment dry bulk		-3 992							-3 992
Total bulk handled	94 748 291	11 449 591	67 442	1 802 754	9 629 123		1 517 840	66 465 612	185 680 653
LIQUID BULK CARGO (METRIC TONS)									
Liquid bulk landed	955 086	25 447 094	1 048 412	6 015	629 139	1 026 263	1 230 219	4 555 229	34 897 456
Liquid bulk shipped	1 102 318	2 857 916		6 015		483 747	788 049		5 238 046
Transshipment liquid bulk	263 305	1 851		936 028	154 251		113 003		
Total liquid bulk handled	2 320 710	28 306 861	1 048 412	948 059	783 391	1 510 011	2 131 271	4 555 229	41 603 943
BREAKBULK (METRIC TONS)									
Breakbulk landed	86 254	1 694 899	470	27 219	208 909	1 438	266 056	28 065	2 313 311
Breakbulk shipped	1 403 229	825 081	10 476	14 694	61 423	15 739	124 462	506 108	2 961 212
Transshipment breakbulk	2 532	20 549					79 190		102 271
Total breakbulk handled	1 492 016	2 540 529	10 946	41 913	270 333	17 177	469 708	534 172	5 376 794
TOTAL CARGO HANDLED	98 561 017	42 296 981	1 126 800	2 792 726	10 682 847	1 527 188	4 118 819	71 555 013	232 661 390
CONTAINERS (TEUs)									
Containers landed	4 106	1 248 088	28 304	171 317	36 885		369 403	4	1 858 107
Transshipment containers		160 081		216 815	38 108		60 650		475 654
Containers shipped	6 100	1 278 252	28 167	150 441	43 301		372 273		1 878 534
Transshipment containers		157 507	2	206 087	46 570		59 539		469 705
Total containers handled	10 206	2 843 928	56 473	744 660	164 864	0	861 865	4	4 682 000

The text box shows the TEU volumes handled by the Port of Durban in 2018, compared to that of the port of Rotterdam and the ten busiest ports in the world.

TEU volumes of busiest ports vs Durban		
Port	Country	Throughput 2018 ('000 TEU)
Shanghai	China	42 010
Singapore	Singapore	36 660
Shenzhen	China	27 740
Ningbo-Zhoushan	China	26 350
Guangzhou	China	21 870
Busan	South Korea	21 660
Hong Kong	Hong Kong	19 600
Qingdao	China	18 260
Tianjin	China	16 000
Dubai	UAE	14 950
Rotterdam	Netherlands	14 510
Durban	South Africa	2 957

3.4 Key role-players

The key role-players in the South African logistics sector are summarised in Figure 3.10.

They can be grouped into four categories, namely:

- Infrastructure provision and regulation (e.g., government departments, state-owned enterprises, and government agencies);
- Services (e.g., 3PL & 4PL companies, freight forwarders, couriers, shipping lines & agents, private port terminal operators, airfreight carriers, private storage facilities, financial services, insurance, ICT, and consulting);
- Enabling environment (e.g., customs, regulatory bodies, finance, training, and research); and
- Customers (e.g., freight owners).

The major private sector role-players are listed in GAIN & Frontier Analysis (2014), while a selection of the key role-players in Figure 3.9 are listed in Appendix B.

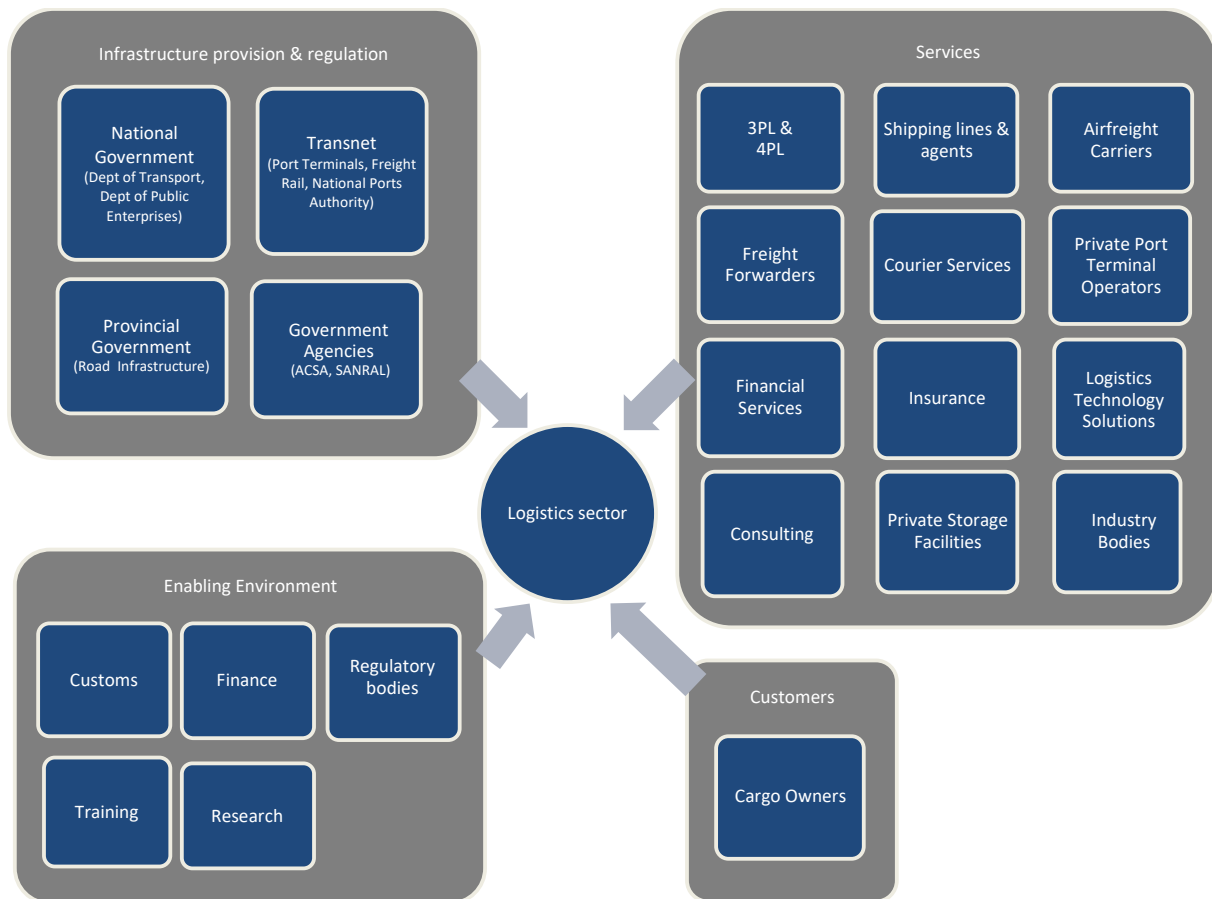


Figure 3.9 Key role player in the logistics sector (Source: authors)

South Africa's logistics landscape is the most sophisticated, and handles the freight of the second-largest economy on the continent. It functions within a well-structured environment. However, logistics takes place in an environment of neglected maintenance and accompanying infrastructure degradation, and relatively high logistics costs.

This inefficient environment provides inherent opportunities for improvement and optimisation.

4. Industry trends

4.1 Technology trends and drivers of change

This section provides insight into trends and drivers of change in the logistics sector. The trends listed below have the potential to impact the South African logistics sector, and are provided as context against which the readiness of the sector for uptake of technology is explored.

By utilising digital technologies, companies will be able to compete on value addition rather than on price alone. Trends that are relevant to the logistics industry are summarised below, per area of application (Crampton, 2017; DHL, 2018; Glynn, 2019; Kneale, 2019; LeClair, 2018; McCrea, 2019; Middleton, 2018; Myers, 2018; Payne, 2018; Standard Bank BizConnect™, 2018; Strom, 2018):

Location and visibility

- *Internet-of-Things (IoT)*: IoT platforms enable transparent, responsive supply chains by locating and tracking the movement of goods in real time. By using sensors and mobile devices, vehicles and other equipment become nodes in the IoT.
- *Wearable technology*: wearable devices can be used to scan barcodes, monitor movement of workers in warehouses to assist them with shorter routes, determine driver fatigue, and others.
- *Blockchain*: blockchain technology provides processes for creating, recording, and storing data and transactions automatically in a shared network, thereby ensuring tamper-proof records and transparency as products move through the supply chain.

Management information, planning, decision making

- *Big data and predictive analytics*: big data refers to datasets that are too large to be analysed by traditional methods, but that could be analysed computationally to identify patterns and trends. Predictive analytics can be used to improve demand forecasting and predict future consumer behaviour trends. By using 2D barcodes, companies can capture a large amount of product information that can be used to optimise order quantities and delivery timing, thereby reducing minimum safety stock levels.

Efficiency improvements

- *Augmented reality (AR) and virtual reality (VR)*: AR can increase the efficiency of the picking process through the use of smart glasses, and can assist drivers with the delivery process by projecting route and load information onto the windshield. VR can be used to create a simulated environment for training purposes.
- *Digital supply chain twins*: a digital twin is a digital replica of the physical supply chain, including all the entities along with their processes and interrelationships. The virtual supply chain exists in parallel to the physical supply chain, and is used to understand the system in order to improve operations and efficiency.
- *Digital freight platforms*: digital platforms connect transporters and freight owners directly to match demand with supply.

Warehouse management

- *Robots, cobots, and artificial intelligence*: robots and cobots (collaborative robots that have been designed to assist humans) use artificial intelligence to perform tasks such as picking inventory, loading pallets, and moving cargo in the warehouse.

- *Drones*: drones with radio frequency identification (RFID) sensors can scan RFID tags at a distance of more than 10 m. This is much faster and more accurate than using humans for stock counts, and is especially useful in tall buildings.
- *Warehouse management systems (WMS)*: advances in WMS include machine learning for adapting to changing conditions, pay-as-you-go services and cloud software, improvements in user interfaces, integration with IoT, acceptance of last-minute orders, managing returns to inventory, and functionality to ease implementation.

Automated transport

- *Self-driving vehicles*: it is estimated that long-haul vehicles could become autonomous within 10 years. This will lead to cost savings from reduced insurance premiums based on improved driving safety, as well as from optimised acceleration and braking. The use of platooning technology (linking two or more trucks in convoy) will reduce fuel consumption.
- *Automatic guided vehicles (AGVs)*: when deployed with warehouse management and other systems, AGVs can assist in meeting strict requirements for accuracy, speed, and cost.

Environmental impact

- *Green technology*: – e.g., cool-roof systems, solar panels, LED lights, thermal glass, and clerestory windows are used in new warehouse buildings. Liquefied natural gas (LNG)-powered trucks as well as electric and hybrid trucks are becoming more popular.

4.2 The South African transport environment

The poor economic climate in South Africa has led to a reduction in consumer spending. In addition, the agriculture, forestry, and fishing industry, as well as the manufacturing and mining industries, all contracted by between 8% and 13% during the first quarter of 2019. This situation, which has a negative effect on transport volumes, is expected to continue as the GDP growth forecast for 2020 and 2021 are 1.8% and 2.0%, respectively (Kneale, 2019).

The South African transport sector accounts for 10.8% of all greenhouse gas emissions, with road transport contributing 91.2% of the transport sector's share. The Green Transport Strategy of the Department of Transport aims to reduce emissions by shifting 30% of freight transport from road to rail and converting 5% of the vehicle fleet to cleaner alternative fuel and efficient technology vehicles in the next five years. A carbon tax has also been included in the fuel levy. In addition, consumers are increasingly demanding more environmentally friendly products and services.

The transport industry will have to adapt their operations in order to comply with these requirements. In response, Imperial Logistics has conducted trials with LNG-powered trucks. Electric and hybrid trucks are also becoming more affordable (Kneale, 2019).

In spite of numerous training programmes and initiatives, there is a shortage of skills in the logistics sector (Kneale, 2019). The gap between available and required skills will widen as new technology is adopted. Given the current unemployment rate of 29% in South Africa, there will be resistance from labour against automation, even if it improves accuracy and efficiency.

Labour issues and social unrest are major sources of disruption. During the last three weeks of May 2019, at least 20 trucks were torched per week in KwaZulu-Natal. The violence had cost the trucking industry more than R1.2 bn over the eighteen months prior to May 2019, with more than 200 lives lost and 1300 trucks destroyed or damaged, according to the RFA (Kneale, 2019).

The ongoing deteriorating road infrastructure conditions result in higher vehicle maintenance and tyre wear, downtime for repairs, and longer driving times owing to lower speeds and alternative routes. All of these contribute to higher costs. In addition, disruptions in electricity supply cause traffic congestion, interruptions to security and communication systems, and disruption to temperature-controlled and automated storage facilities. This further contributes to additional costs from back-up power supplies and delays (Kneale, 2019; Standard Bank BizConnect™, 2017).

4.3 Implications for role-players in the logistics sector

The technology and industry trends outlined here have implications for logistics costs, and the management of cost and profitability pressures. Specifically:

- New technology developments have the potential to counter increasing costs through improved efficiencies, which are essential in this contracting economic environment (e.g., drones, robotics, AI and WMS);
- New technology developments can support new business models, thus facilitating increased profitability (e.g., big data analytics and blockchain);
- Appropriate adoption of new technology can assist companies to remain relevant in a changing market, thereby facilitating long-term competitiveness (e.g., big data, analytics, drones); and
- New technology adoption can facilitate cost-effective responses to environmental compliance pressures (e.g., solar panels and LNG-powered trucks).

Despite the hype about the 4th industrial revolution (4IR) and the abovementioned supporting technologies, only a few companies in South Africa are doing proofs-of-concept or developing strategies, while many are waiting to see how things will develop (Ade, 2019; Doyle, 2019).

Although IoT is still an emerging technology in South Africa, a number of ICT providers are investing in IoT networks and solutions. In 2017, there were approximately seven million devices connected to IoT networks in South Africa and this number is expected to double by 2022. Unfortunately, few of these devices are interoperable, as technology companies each develop their own independent solution. It is anticipated that the rollout of IoT will have to be driven by government and the public sector, due to the cost and complexity thereof (Doyle, 2019).

The rise of edge computing is expected to facilitate the uptake of wearable devices in industries such as manufacturing, logistics, and warehousing (BizCommunity, 2018).

The main challenges preventing technology adoption in South Africa are the severe scarcity of relevant skills, lack of digital readiness and understanding of the benefits, absence of standardisation of technology across sectors, together with a shortage of successful projects to serve as benchmarks. The 4IR will reduce the percentage of lower-skilled jobs, which could increase the unemployment rate unless workers are able to upskill (Ade, 2019; Doyle, 2019).

At present, many organisations in South Africa do not have the skills to utilise digital technologies effectively. There is therefore a huge opportunity for digital skills development and knowledge transfer regarding the benefits of these technologies across the logistics sector.

This could include pilot projects and benchmarking exercises as proofs of concept.

5. South African perspectives

The South African logistics environment is characterised by government-owned infrastructure, structural inefficiencies, an imbalance in freight flows between road and rail, and unequal access to rail infrastructure for selected sub-sectors in the market. Both local and international logistics service providers serve the private sector, and some innovation is present to overcome structural challenges.

This environment leaves significant room for engagement and improvement, and transfer and adoption of specialist skills and innovations. Key challenges (and, by implication, opportunities), as expressed by participants, are summarised below.

5.1 The national infrastructure & its operators

Rail

The national rail infrastructure is characterised by bottlenecks, as well as non-native freight on road due to rail inefficiencies. These stem from a historical lack of investment in infrastructure, lack of maintenance, and insufficient skills, all of which drive freight to road. Sectors such as agriculture have limited access to rail capacity which, in turn, hampers exports.

Freight owners are frustrated by the long turnaround times on rail links, damage to loads, and the inability to accurately track freight. Participants indicated that the rail service provider's model of transferring maintenance of sidings and branch lines to municipalities has impacted negatively on maintenance. Freight owners have built their own sidings, but find it difficult to obtain servitudes from Transnet.

Theft of railway lines have resulted in innovative technology development to detect breaks in tracks. While such innovations could be useful in various contexts, the focus should be on developing a sustainable, workable rail network, rather than to work around such systemic "breakdowns".

The rail service provider is collaborating with specific sectors to develop improved export channels, from farm to offshore customer, which provides opportunities for international collaboration.

Further, the rail service provider has announced the use of concessions on branch lines with the aim of improving efficiencies, which could facilitate opportunities for sector-specific rail-based service provision.

Road

The undue load of non-native freight on road is resulting in increased transport costs. Freight owners perceive changes in service provision by the rail service provider as too slow, and invest to position their operations for a permanent shift to road (e.g., by removing sidings to silos and production facilities). *These permanent shifts create an urgency for addressing rail inefficiencies.*

Ports

Throughput at the ports are hampered by capacity constraints, operational inefficiencies, and labour unrest. Load shedding by the national electricity provider is affecting the management of reefer

containers and hence the reliability of the cold chain. *Opportunities exist to introduce innovative, cost-effective solutions for cold-chain transport.*

A focus on infrastructure development has been announced by the President of South Africa in the February 2020 State of the Nation Address, which is expected to translate into opportunities for government–private sector collaboration (see Section 7).

Airports

Airport investment is exceeding that of other national infrastructure, and airfreight is functioning well. Participants did not highlight the same frustrations with air freight as with land-based freight.

Hubs, terminals, and warehousing facilities

Major container terminals are Transnet-owned. Hubs and warehousing facilities are privately owned, and sufficient capacity exists. Participants indicated that, while some service providers operate technologically advanced warehousing facilities, *the opportunity exists for modernisation of warehousing management systems.*

The South African president announced a focus on infrastructure development, with a specific focus on ports, roads, railways, airports, and pipelines in the February 2020 State of the Nation Address. An infrastructure growth target of 30% is required to reach economic growth targets. It is foreseen that infrastructure development will be a collaborative effort between government, development financiers, and the private sector.

The opportunity exists for collaboration in infrastructure development projects and innovation for operational efficiency improvements. The objective is optimal efficiency of an adequately-capacitated internal logistics infrastructure system.

Problems are recognised, and some initiatives are underway to alleviate inefficiencies and constraints.

5.2 Technology adoption & advisory

Study participants are aware of the need for preparation and capacity development for the adoption of technology, specifically with a view on the fourth industrial revolution. However, participants indicated that, while some pockets of excellence exist, the ability to adopt new technology is not widespread. The need to enhance such capacity exists in specific areas, such as warehouse management systems, big data, artificial intelligence, blockchain, drone technology, and robotics.

Other focus areas include a transition to more environmentally friendly trucks (e.g., Euro 5, 6, and 7) to replace the dated vehicles that are currently in use.

The need for enhanced capacity exists across organisations of different maturity, with a specific opportunity for emerging logistics service providers.

5.3 Logistics management

Various opportunities exist for improved management of logistics operations, including enhanced management of customs operations, smart port operations, and management of congestion. In general, supply chain planning and agility can be enhanced; time and cost in the supply chain needs to be reduced, without compromising on risk, safety, and security.

5.4 Skills development and professional development

Skills and professional development are in the hands of organisations such as SAPICS and the transport sector education training authority (TETA). While these organisations contribute significantly to human capital development, capacity is limited. The training as provided by traditional universities is seen as lacking in adequate preparation for practice, and standardisation across training institutions is lacking. Industry has responded by working with private universities to develop customised training.

The following needs were raised by participants:

- Identification of best practices for supply chain management;
- Partnerships for capacity development for 4IR adoption;
- Basic skills development (mathematics, English) to prepare students for participation in formal logistics and supply chain training programmes
- Initiatives to bridge the gap between formal (theoretical) training and work readiness (some successful initiatives are under way, but require partnerships for expansion; opportunities in maritime sector);
- Programmes to enhance the quantitative content of logistics training;
- Collaborations for training and development of emerging logistics service providers and enterprises, for participation in formal industry; and
- Partnerships for the development of enterprises to meet quality standards for export.

The players in sector and skills development have a thorough understanding of needs and constraints, and can serve as valuable entry points for collaboration. Accreditation of qualifications are in place through the TETA. Industry bodies have expressed their interest in acting as partners in skills development collaborations, some of which could be funded or co-funded by their members. The needs expressed extend in some instances to the rest of the continent. Some skills development requirements are expected to be driven by legislation in future, and are also expected to seek alignment with international standards.

Numerous examples exist of collaborations with Dutch firms and training institutions for skills development and student exchange programmes (including general logistics training, maritime, rail, ports, and others). An alumni of students have developed, who can serve as entry points for further skills development programmes, partly due to their knowledge of the Dutch logistics environment. Further, some participants indicated that the connection of many supply chains into the Netherlands (including from South Africa) leaves the potential for internationalisation of supply chain knowledge.

5.5 Collaboration and coordination

Participants perceive a lack of collaboration and coordination across spheres of government, and between government and the private sector, with respect to the management of the logistics environment.

For example:

- Mixed messages are sent from government and municipalities, respectively, about issuing of fines for transgression of the height of containers (high cubes) that are carried, leaving the industry in disarray.
- Participants indicated that industry finds it difficult to coordinate with Transnet for service-level agreements at the sector rather than the firm level.
- Participants indicated that customer relationships between Transnet and freight owners should be improved.
- Permits for special loads per road are issued per province, which severely complicates the process for service providers and adds to the cost.
- Participants perceive the intended shift from road to rail as a concept rather than a well-conceptualised strategy, partially due to the lack of alignment between national and provincial freight strategies.

Levels of Government

National Government

9 Provincial governments

257 Local government bodies (municipalities):

- ⇒ 8 metropolitan municipalities
- ⇒ 44 district municipalities
- ⇒ 205 local municipalities

Source: Main, 2019

Selected sector-specific initiatives are under way to resolve operational inefficiencies collaboratively (e.g., the Flying Swans initiative in the fruit sector, and port renewal initiatives). Opportunities exist to learn from and expand these collaborations to other sectors. Solutions are required across the board to reduce the overall cost of logistics for increased competitiveness.

In summary, engagement with the South African industry players indicated the following needs for revitalisation of the logistics system:

Table 5.1 South African perspectives on industry needs

	<i>Focus area</i>	<i>Description</i>	<i>Need / opportunity identified by industry</i>	<i>Opportunity for</i>
forward-looking	Technology adoption & advisory	Defining and identifying relevant innovation in logistics Internationalisation of innovation SMME stimulation	Introduction and adoption of technology innovations (drones, blockchain, AI, robotics) Diffusion of technology opportunities to the entrepreneurial level Simplistic technology that is easy to use in resource-constrained environments	Technology strategists Technology providers Technology developers
logistics management and operations	Collaboration and coordination	Sector-wide strategy development	Translation of intent into workable strategies (e.g., road to rail initiative)	Logistics consultants & engineers
		Efficient operations	Improved port operations, supply chain efficiency & agility	Logistics consultants & engineers
capacity development	Infrastructure revitalisation	Ports	Ports efficiency for improved export capacity	Logistics consultants & engineers Technology providers
		Road to rail		
		Efficient use	Warehouse management systems	
		Investment	international investment guidance	
		in general	More sophisticated and more mature infrastructure	
	Skills development	Technology adoption	Partnerships for 4IR capacity development Simulators (e.g., for train driver training)	Technology providers Training providers Organisational developers
		Work readiness	Enhancing current initiatives to bridge the gap between formal education and functioning in the work environment	
		Development of emerging logistics service providers	Development of emerging service providers in specific sectors (maritime, etc.)	
	Pilot initiatives	Development of emerging logistics service providers	Informal supply chain development (e.g. spaza retailing) Initiatives to develop emerging logistics service providers	Logistics consultants

6. Current Dutch experiences

The Dutch logistics sector is driven by innovation, research, and best-in-class solutions, which are in turn determined by economic and foreign policy, and a need to foster logistics leadership.

6.1 Areas of interest and current involvement

The areas of excellence and interest expressed by Dutch participants are naturally supportive of the needs of the South African logistics sector. Dutch players are involved with, or expressed interest in, a variety of aspects, including trade and investment facilitation, innovation, training, research, and logistics service provision and management. Table 6.1 outlines the areas of interest, with examples of proposed or current local involvement, where applicable.

Table 6.1 Dutch perspectives: Areas of interest

	Focus area	Description	Examples
forward-looking	Innovation, research, technology development	Defining and identifying relevant innovation in logistics Internationalisation of innovation SMME stimulation Collaborative research programmes to combine scientific and industry knowledge for practical solutions	Proposed: Sustainable logistics (green, circular economy) Data-driven logistics ICT platforms: enhanced supply chain coordination and data sharing Alternative truck configurations: reduced ecological impact Completed / in progress: Collaborative programmes between Dutch and South African universities for service and business logistics
logistics management and operations	Trade, investment	Trade development & investment facilitation	Completed / in progress: Facilitate investment / trade visits for SA economic development zones Facilitate trade participation for Dutch logistics companies
	Logistics channel development	Commercial logistics export and import service provision (end-to-end)	Completed / in progress: Large Dutch-owned logistics service providers between Europe and SA; increased appetite for imports from SA (fruit, wine, electronics, pet food, etc.)
		Smaller niche service providers	Proposed: Smaller consultancies to provide niche services
	Logistics management	Pharmaceuticals	Proposed: Knowledge sharing for chain management
		ICTs in supply chain coordination and customs management	Proposed: Knowledge & expertise for lobbying and collaboration re. sharing of digitised information
		Asset management	Completed / in progress: Collaborate with SA companies for improved asset management, spares availability on infrastructure projects
	capacity development	Infrastructure	Ports & airports
Road to rail			Proposed: Knowledge and expertise sharing for intermodal solutions
		Efficient use	Proposed: Intelligent traffic systems Warehouse management systems
		Investment	Proposed:

			Prioritisation of investment
	Education	Various firm- and subsector-specific initiatives, in collaboration with local education and training authority partners, universities	Completed / in progress: Leadership development exchange programmes (supply chain and logistics, international trade) Development of university modules in warehouse operations and management, maritime
	Pilot initiatives	Innovative service delivery	Completed / in progress: Parcel deliveries by taxi companies

6.2 Enablers and challenges

Dutch firms that have experience in engaging in South Africa balance their profit motives with other considerations, such as South Africa as gateway to African markets, and a desire to engage in a challenging environment where they can make a difference.

Participants encounter challenges related to the ease of doing business in an environment that is dominated by state-owned infrastructure and regulations. Specific challenges relate to logistics infrastructure, bureaucracy, and compliance requirements (specifically BBBEE).

Factors that enhance the ease of doing business include:

- South Africans are well motivated to engage with training programmes;
- There is a willingness to collaborate;
- The Netherlands have cultural ties with South Africa;
- The time zone is similar; and
- The Dutch Embassy is playing a key role in facilitating engagement with the South African market.

Key challenges are summarised in Table 6.2.

Table 6.2 Dutch perspectives: Challenges

<i>Challenge</i>	<i>Description</i>
Regulation	Complicated, slow regulation, especially with respect to government and Transnet engagements BBBEE requirements are difficult to comply with - difficult to develop the right connections Visa requirements are hampering ease of doing business
Valuable collaborations	It is sometimes difficult to identify collaborations that are worth developing
Investment risk	SMEs have lower-risk alternatives in European countries
Currency risk	Would be easier to do transport-related transactions in USD rather than ZAR
Infrastructure ownership	Difficult to provide market-responsive solutions in a bureaucratic, government-owned infrastructure environment Main gateways (ports, etc.) require privatisation and modernisation Operational challenges at ports and in the customs system are not enabling efficiency Alternative, more efficient gateways are emerging On-time vessels from Africa 60%, compared with 85-90% in Europe
Skills	Skills development is lacking Advanced logistics and quantitative skills are required

6.3 Successful collaborations

Engagement between South Africa and the Netherlands have delivered some promising initiatives, that serve as examples of success or good progress towards success.

6.3.1 Facilitating export: The Flying Swans

The Flying Swans Africa initiative is a Dutch consortium that aims to enable entrepreneurs to succeed in developing markets in Africa, Asia, and South America by coordinating an integral, simultaneous effort from different Dutch sectors (Flying Swans, 2020). In addition to connecting emerging markets to global value chains, the initiative aims to create a sustainable role for Dutch companies to participate in local, regional, and South-North trade flows (Freshplaza, 2015). The consortium is made up of Mercator Novus, developer of agro-logistics concepts for improved efficiency; Frugi Venta, the representative body of the fresh produce sector and collaborator with DPA in the GroentenFruit Huis; Boskalis, a global onshore and offshore infrastructure provider, the Port of Rotterdam and FMO, the Dutch development bank, with the goal of facilitating more integrated programs (Freshplaza, 2015).

Under this initiative, the Flying Swans are collaborating with Transnet for the development of a citrus export channel from the production areas in the northern provinces of South Africa through the ports of Cape Town and Durban to the Netherlands. The overall purpose is to implement improvements in the agro-logistics system, with a focus on an unbroken cold chain (Freshplaza, 2015).

6.3.2 Enabling emerging service providers: Parcel delivery pilots

A Dutch capacity development organisation partnered with the South African taxi industry and the TETA to develop emerging entrepreneurs to position their businesses to deliver parcels, in addition to transporting passengers. The programme included training, as well as visits to large taxi companies in the Netherlands to facilitate knowledge transfer.

6.3.3 Investing in capacity development: Logistics leadership development

A number of examples exist of training and development of South African logistics trainees by Dutch institutions. Training is presented in various formats, including formal training programmes presented in South Africa in collaboration with South African partners, visits to the Netherlands for structured or unstructured training, or internships (cadets) for maritime training on Dutch facilities. Programmes are funded through development funding, or co-funded by South African industry. Hosting organisations report that students are keen to learn, and that good knowledge transfer takes place. In addition to direct training, good networks are developed upon which future initiatives can be based.

7. Opportunities

7.1 The opportunity landscape

The South African logistics sector provides opportunities for development at the national level, while also serving as gateway to regional and continent-wide opportunities. South African companies have

a footprint of success across the continent, with experience in navigating the associated logistical challenges.

The South African industry is addressing developmental challenges that are of global interest, and as such presents opportunities for solution development that could be exported globally. Examples include solutions in public health supply chains, and small business development in resource-constrained contexts. Industry bodies are well integrated with the sector, and provide good entry points for partnership and collaboration. The recent focus of the South African government on infrastructure renewal (specifically ports) provide opportunities for collaboration and innovation. The complexity of the environment allows for the development of leading practice solutions for transfer to less complex contexts.

The needs expressed by South African participants (Table 5.1) and areas of interest expressed by Dutch participants (Table 6.1) show significant overlap. The following key focus areas flow from the interviews:

- innovation, research, technology development and adoption
 - education and skills development
- logistics management and operations improvement
 - targeted pilot development projects
- infrastructure revival and development
 - logistics channel development

Figure 7.1 provides a subjective overview of these activities against their difficulty (speed) of implementation and potential impact for improved logistics.

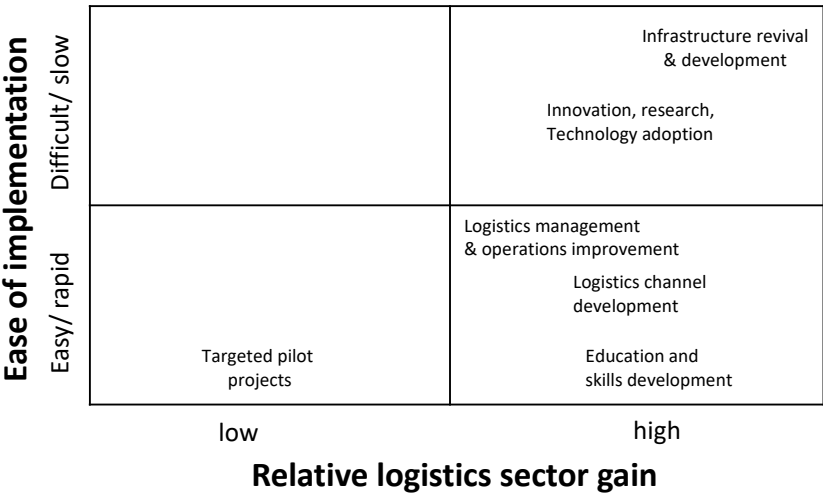


Figure 7.1 Prioritisation of opportunities (Source: authors)

South African partners that could contribute to the various focus areas are summarised in Table 7.1.

Table 7.1 South African partners per focus area

Focus area	Partners

infrastructure revival and development	Government, Transnet, Freight owners
Innovation, research, technology introduction	RFA, SAPICS, SA Universities, CSIR
Logistics management & operations improvement	Transnet, Logistics service providers
Logistics channel development	Transnet, freight owners, logistics service providers
Education and skills development	RFA, SAPICS, TETA, SA Universities and training institutions
Targeted pilot development projects	RFA, SAPICS, TETA

7.2 Upcoming focus areas

Infrastructure revival

The South African president announced a focus on infrastructure development in the 2020 State of the Nation address. Development programmes will be a collaboration between government, development financiers, and the private sector, and will be coordinated by the Office of Investment in Infrastructure in the presidency.

Specific actions have been announced to remove obstacles to infrastructure development (South African Government, 2020a)

- Development of technical and engineering capabilities in government;
- Development of a detailed infrastructure investment plan, that will send a positive message to investors and lenders, and revitalise the construction industry;
- Reform of the current policy and regulations that has the unintended consequences of prohibiting investment;
- Review of the nature of financing, with the establishment of a planned infrastructure fund that facilitates private sector participation in the implementation of public infrastructure projects; and
- Review of the existing fragmented and vague framework for public infrastructure development, that is hampering the optimal management of infrastructure projects.

Infrastructure development focus

- **R1.6 billion** – amount reprioritised to support an emergency action plan until the end of the current financial year.
- **Over R700 billion** – potential investments to public infrastructure sectors over the next 10 years.
- **350 000 to 500 000** – future residents of a new smart-city taking shape in Lanseria within the next decade.
- **50** – kilometres of experimental road stretches to be piloted as part of an alternative rural roads programme.

Source: South African Government, 2020b

Specific projects include the fundamental overhaul of the Port of Durban during 2020 to reduce delays and costs.

Provincial governments are focusing on infrastructure development and efficiency improvements. Recent areas of focus include infrastructure upgrades and reduced congestion at the Port of Cape Town. The Western Cape Department of Economic Development and Tourism is coordinating a task team of representatives from provincial and national authorities and the private sector, which aims to define remedial action. Other improvements include a recent concession and investment in a dry dock at the Port of Cape Town (Wesgrow, 2019).

Opportunities for operational improvement at the Port of Cape Town

Reduction in shipping days lost to congestion: **3 days per arrival, i.e. 1530 shipping days per year**

Improved availability of **2.5 shipping cranes per ship, to be closer to the global standard of 3-5 per ship.**

Source: South African Government, 2019

Modal shift

The road to rail project is an initiative between Transnet and selected sectors.

A lack of intra-modal competition results in sub-optimal levels of innovation and customer satisfaction. The Road-to-Rail Strategy developed by Transnet will propose steps to correct intra-modal competition between road and rail. It should, however, **be noted that intra-modal competition is only applicable to branch lines and not to the core network**, which is and will continue to be owned and operated by Transnet. The mechanism to host the intra-modal competition on branch lines exists in the PSP framework and Green Paper on National Rail Policy currently being developed by the DoT.

In the agriculture sector, which presents the biggest opportunity to move bulk freight off the roads, discussions are supported by research by the National Economic Development and Labour Council (Nedlac) to determine the most appropriate approaches, and to identify sidings that are economically viable to revitalise. The research includes establishment of collaboration between role players for information sharing.

Opportunities exist to support revitalisation initiatives by innovation and research, and to derive approaches that will ensure sustainability.

Privatisation of branch lines

An initiative is underway to facilitate privatisation of branch lines, with a focus on the agriculture sector. Research has been initiated to identify the most appropriate lines for privatisation.

Private financing of rolling stock and African opportunities

The railroad association (RRA) has been working with the Rail Working Group (a Swiss-based NGO) to pursue the African-wide ratification of the Luxemborg Rail Protocol, which would facilitate private ownership of rolling stock. The association welcomes collaboration with private role players, to engage with their members for exploration of opportunities across the continent.

7.3 Strategy for engagement: models of collaboration

The focus of collaboration is to effect positive change in the logistics sector, that would lead to short- and long-term economic benefit for stakeholders. Research participants consider foreign investment as a means of facilitating positive change.

Participants in the study indicated the following principles for successful collaboration between Dutch and South African partners for investment in the industry:

- The environment is complex, and bite-size rather than over-ambitious initiatives are more likely to be successful
- Expectations should be realistic in this complex environment
- Large private role players or industry bodies are key entry points, both into South Africa and the rest of the continent.
- Industry bodies are involved in numerous sector development initiatives, and are keen to facilitate access to industry.
- Companies are open to collaboration, and industry bodies can serve as pointers to appropriate collaborators
- Transnet as big national role player should be included where relevant
- Public-private sector partnerships are possible and popular in Africa

The current logistics sector development models are:

- private sector: direct investment in own business development; and
- public sector: loans for development of own infrastructure

The following models of collaboration (and hence, sources of funding) were proposed by participants:

Table 7.2 Models of collaboration

<i>Model</i>	<i>Application, as example</i>
Foreign direct investment (FDI) and joint ventures	Export channel development, for example in the fruit industry
Public-private partnerships	infrastructure development
Official Development Assistance (ODA) (Collaborations for EU, World Bank, Dutch development corporation funding)	Infrastructure development Skills development
Joint ventures, South African industry-funded initiatives, EU-funded initiatives	Partnerships for skills development (industry bodies, Dutch and South African training institutions); course development; exchange programmes
Regional coalitions and collaborations to seek strategic co-funding	Development of intermodal facilities

Dutch interviewees indicated the need for awareness creation and face-to-face introductions to convince participants of value in future collaborations, as well as a need for practical support in guiding engagements in the South African context.

A roadmap for enhanced engagement could include the following steps:

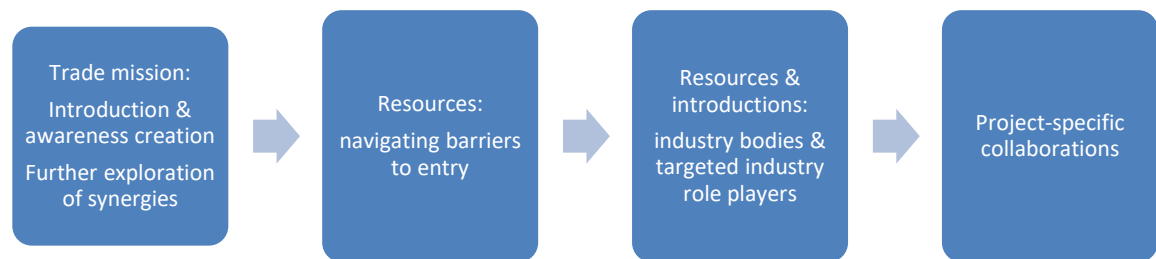


Figure 7.2 Implementation roadmap

Study participants have proposed an Orange Corner at the annual SAPICS conference as a means of introduction and awareness creation.

8. In Summary

The South African logistics sector serves the second-largest economy in Africa. It is, by virtue of past experience and current networks, a valuable entry point into the African continent. However, the sector is plagued by structural inefficiencies. On the one hand, this presents a challenge to economic growth; on the other hand, it provides opportunity for co-development of innovative solutions and means of efficiency improvement. The recently announced focus of the South African government on infrastructure development is indicative of opportunities in this regard.

Dutch and South African study participants identified matching interests and needs, which could be explored in the interest of the development of the South African logistics sector, and to the benefit of Dutch stakeholders. Focus areas include skills development, infrastructure development, pilot development projects, logistics channel development, and research, innovation, and technology development. Existing successful collaborations provide a basis from which to build. The experience of Dutch players that are already active in the South African and African economies are invaluable and should be harnessed in future initiatives. Participants considered the support of the Dutch embassy as invaluable to their engagements in South Africa. Participants indicated that an engagement process should incorporate awareness creation and introductions to the South African context and networks, but also practical support in terms of navigating barriers to business in the South African context.

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Appendix A: Trade events & conferences

Name	Type	Focus	Date & location 2020
Africa Intermodal	Trade Show	Rail, ports, aviation, cargo and logistics https://10times.com/africa-intermodal	30 June – 1 July 2020 Johannesburg
Africa Rail	Conference & Trade Show	Rail tech, smart mobility, regional integration, passenger transport https://www.terrapinn.com/exhibition/africa-rail/index.stm	30 June – 1 July 2020 Johannesburg
Air Cargo Africa	Conference & Trade Exhibition	Air cargo industry products and services https://aircargoafrica.aero/	9-11 February 2021 (held every 2 nd year)
Intra-African Trade Fair	Trade exhibition	Boosting trade in Africa https://www.intrafricantradefair.com/en	September 2020 Rwanda
SAPICS	Conference & Trade Exhibition	Educational and networking event for SCM professionals https://conference.sapics.org/	21-24 June 2020 Cape Town
SARA	Conference & Trade Exhibition	Conference for railway industry in Southern Africa https://sararailconference.com/	20 – 22 May 2020 Johannesburg
Smart Mobility Africa	Conference & Trade Exhibition	Public transport, intelligent transport, 4 th IR http://itssa.org/	5-7 Oct 2020 Pretoria
Southern African Transport Conference (SATC)	Conference & Trade Exhibition	Sustainable transport through enabling partnerships https://www.satc.org.za/	6-9 July 2020 Pretoria
Transport Evolution Africa	Conference & Trade Exhibition	Discuss innovative models of infrastructure development for the African continent. https://www.transportevolution.com/	13-14 October 2020 Durban

Appendix B: Stakeholders

The following table contains a few examples of role-players in the various categories in Figure 3.4

Infrastructure provision & regulation		
National Government	Dept of Public Enterprises	https://dpe.gov.za/
	Dept of Transport	https://www.transport.gov.za/
Provincial Government	Western Cape Dept of Transport and Public Works	https://www.westerncape.gov.za/dept/tpw
	Gauteng Dept of Roads and Transport	https://www.gauteng.gov.za/Departments/Departments
Government Agencies	ACSA	http://www.airports.co.za/
	SANRAL	https://www.nra.co.za/live/index.php
Transnet	Freight Rail	https://www.transnet.net/Divisions/Pages/FreightRail.aspx
	National Ports Authority	https://www.transnet.net/Divisions/Pages/NPAAuthority.aspx
	Pipelines	https://www.transnet.net/Divisions/Pages/TPT.aspx
	Port Terminals	https://www.transnet.net/Divisions/Pages/PipeLines.aspx
Services		
3PL & 4PL	Barloworld Logistics	https://barloworld-logistics.com/
	Imperial Logistics	https://www.imperiallogistics.com/
	Kuehne & Nagel	https://www.kn-portal.com/about_us/about_us/
	Super Group	http://www.supergroup.co.za/
Airfreight Carriers	SAA Cargo	https://www.flysaa.com/about-us/leading-carrier/saa-cargo/about-us
	Airfrance /KLM / Martinair Cargo	https://www.afklcargo.com/WW/en/local/homepage/homepage.jsp
Courier Services	Aramex	https://www.aramex.com/
	DHL	https://www.logistics.dhl/za-en/home.html
	DSV	https://www.za.dsv.com/

Freight Forwarders	Bolloré Logistics	https://www.bolloré-logistics.com/en
	Hellmann Worldwide Logistics	https://www.hellmann.net/en/south-africa/
	Savino del Bene	https://www.savino.co.za/index.php/about
Industry Bodies	CILTSA	http://ciltsa.org.za/
	Road Freight Assoc	http://www.rfa.co.za/RFA/index.php/en/
	Railroad Assoc	https://rra.co.za/site/
	SAPICS	https://www.sapics.org/
	Agricultural Business Chamber	https://agbiz.co.za/
Private Port Terminal Operators	Richards Bay Coal Terminal	https://rbct.co.za/
	Fresh Produce Terminals	https://fpt.co.za/
Private Storage Facilities	CCS Logistics	http://ccslogistics.co.za/
	VOPAK	https://www.vopak.com/terminals/vopak-terminal-durban
Shipping Lines & Agents	Maersk	https://www.maersk.com/local-information/south-africa
	MSC	https://www.msc.com/zaf
	Safmarine	https://www.safmarine.com/about-us
Enabling Environment		
Customs	SA Customs Authority	https://www.sars.gov.za/ClientSegments/Customs-Excise/Pages/default.aspx
Regulatory bodies	Ports Regulator	https://www.portsregulator.org/
	Railway Safety regulator	https://rsrorgza.co.za/
Research	CSIR	https://www.csir.co.za/
	University of Johannesburg	https://www.uj.ac.za/faculties/cbe/Transport-and-Supply-Chain-Management

	Stellenbosch University	http://www.sun.ac.za/english/faculty/economy/logistics
Training	STC International	https://stc-sa.co.za/
	TETA	https://www.teta.org.za/
<i>Public Universities</i>	University of Johannesburg	https://www.uj.ac.za/faculties/cbe/Transport-and-Supply-Chain-Management
	Stellenbosch University	http://www.sun.ac.za/english/faculty/economy/logistics
<i>Private Universities</i>	Da Vinci Insitute	https://www.davinci.ac.za/
Cargo Owners / Exporters / Industry coordinators		
Mining		
<i>Coal</i>	Exxaro	https://www.exxaro.com/
<i>Iron Ore</i>	Kumba Iron Ore (Anlgo American)	https://www.angloamericankumba.com/
<i>Manganese</i>	South32	https://www.south32.net/our-business/southern-africa/south-africa-manganese
Agriculture		
<i>General</i>	Agricultural Business Chamber	https://agbiz.co.za/
<i>Maize/Grain</i>	Afgri	https://www.afgri.co.za/
<i>Fruit</i>	Fruit South Africa	https://fruitsa.co.za/
<i>Fruit</i>	Capespan	http://www.capespan.com/
FMCG	Tiger Brands	https://www.tigerbrands.com/
	Pioneer Foods	http://www.pioneerfoods.co.za/
	AVI	https://www.avi.co.za/
	SAB (AB InBev)	http://www.sab.co.za/
Automotive	NAAMSA	https://www.naamsa.co.za/
Chemicals	Sasol	https://www.sasol.com/
Fuel	Sasol	https://www.sasol.com/

Appendix C: Trade between South Africa and the Netherlands

The following section provides a short overview of trade between two historically important trade partners, South Africa and the Netherlands (Source: TradeMap, 2020. Kindly supplied by Salvino del Bene).

SA's top export destinations		SA's top import origins	
Partner	Trade Value (US\$)	Partner	Trade Value (US\$)
World	93597046864	World	92615924571
China	8550852951	China	17087385967
Germany	6708761194	Germany	9122471150
USA	6358295439	USA	5534566500
United Kingdom	4815810961	Saudi Arabia	5410164899
Japan	4476541166	India	3842819962

Netherlands ranking for SA exports: 12th 3,107,910,228 US\$(thousand)

Netherlands ranking for SA imports: 18th 1,146,342,967 US\$(thousand)

NL's top export destinations		NL's top import origins	
Partner	Trade Value (US\$)	Partner	Trade Value (US\$)
World	555921409863,00	World	500630534558,00
Germany	120452830000,00	Germany	88213923458,00
Belgium	56273988073,00	Belgium	51820782615,00
United Kingdom	44884544262,00	China	46018949891,00
France	43457560341,00	USA	39524334403,00
USA	26777339118,00	United Kingdom	28785200973,00

SA ranking for Netherlands exports: 40th 2,229,994,280 US\$(thousand)

SA ranking for Netherlands imports: 44th 1,638,569,032 US\$ (thousand)

SA's top 5 export product categories to Netherlands							
HS code	Product label	Value in 2014	Value in 2015	Value in 2016	Value in 2017	Value in 2018	Growth 2014-2018
'08	Edible fruit and nuts	615680	563341	592476	677106	735085	19%
'26	Ores, slag and ash	481488	305041	364516	538761	509264	6%
'72	Iron and steel	445992	221791	174200	368168	347296	-22%
'27	Mineral fuels and oils	768032	164316	189556	265501	282556	-63%
'28	Inorganic chemicals	58630	65073	61971	91045	223174	281%

SA's top 5 import product categories from Netherlands							
HS code	Product label	Value in 2014	Value in 2015	Value in 2016	Value in 2017	Value in 2018	Growth 2014-2018
'84	Nuclear reactors and appliances	183813	162625	178471	191954	156465	-20%

'27	Mineral fuels and oils	211355	229256	166579	188976	133732	-15%
'39	Plastics and articles thereof	85028	79201	77957	78814	89384	-37%
'15	Fats and oils	58574	57703	71701	63671	75516	5%
'29	Organic chemicals	57361	65342	58298	72198	68964	29%

Netherlands' top export product categories to SA							
HS code	Product label	Value in 2014	Value in 2015	Value in 2016	Value in 2017	Value in 2018	Growth 2014-2018
'84	Nuclear reactors and appliances	506643	394787	373534	436287	431837	-15%
'85	Electrical machinery (Sound)	213099	171460	178466	192921	328833	54%
'27	Mineral fuels and oils	162493	295328	273348	303529	323401	99%
'90	Optical and medical instruments	175222	149156	140208	162652	192119	10%
'30	Pharmaceutical products	167230	148587	68625	83175	106447	-36%

Netherlands' main import product categories from South Africa							
HS code	Product label	Value in 2014	Value in 2015	Value in 2016	Value in 2017	Value in 2018	Growth 2014-2018
'08	Edible fruit and nuts	812506	594645	652329	710527	772383	-5%
'26	Ores, slag and ash	74194	65284	79894	65899	138067	86%
'27	Mineral fuels and oils	333769	143698	104083	111127	92339	-72%
'38	Misc. chemical products	16332	218	574	1318	83850	413%
'75	Nickel and articles thereof	41314	2618	3517	10354	69039	67%

Description of Netherlands' exports to SA				
HS code	Description	Value in 2018, USD thousand	Annual growth, 2014-2018, %, p.a.	Share in NL's exports, %
Fruits and vegetables				
'120991	Vegetable seeds, for sowing	21258	8	1
'060290	Live plants, mushrooms	3893	10	0
'060110	Bulbs, tubers, tuberous roots, corms	2873	-4	0
'090121	Roasted coffee	1076	-3	0
'110100	Wheat or meslin flour	931	20	1
Fats and oils				
'150790	Soya-bean oil and its fractions	40598	9	22
'150710	Crude soya-bean oil	12862		5
'151211	Crude sunflower-seed or safflower oil	10341	-17	3

'151419	Low erucic acid rape or colza oil	6106		5
'151411	Low erucic acid rape or colza oil, crude	1399		2
Prep foods				
'220300	Beer made from malt	37363	85	2
'230910	Dog or cat food, put up for retail sale	23235	-3	2
'210690	Food preparations, n.e.s.	15926	-7	1
'210111	Extracts, essences of coffee	11475	157	4
'230990	Preparations of a kind used in animal feeding	6651	-4	0

Description SA's exports to Netherlands				
HS code	Description	Value in 2018, USD thousand	Annual growth, 2014-2018, p.a.	Share in SA's exports
Fruits and vegetables				
'080610	Fresh grapes	224042	2	39
'080510	Fresh or dried oranges	120849	5	16
'080440	Fresh or dried avocados	79352	3	68
'080520	Fresh or dried mandarins	50888	17	19
'080830	Fresh pears	41635	-2	21
Fats and oils				
'151800	Animal or vegetable fats and oils and their fractions	10304	55	80
'150420	Fats and oils of fish and their fractions	390		5
'151590	Fixed vegetable fats and oils and their fractions	367	-38	9
'150430	Fats and oils and their fractions of marine mammals	229		27
'150910	Virgin olive oil and its fractions	27	-19	1
Prep foods				
'220421	Wine of fresh grapes	45737	-3	9
'200929	Grapefruit juice	23576	11	50
'200939	Single citrus fruit juice	11890	31	45
'200911	Frozen orange juice	11113	-1	77
'200919	Orange juice	8084	-31	28

Appendix D: Tenders and upcoming infrastructure projects

Tender information of all public sector organisations at all spheres of government can be found on the Government of South Africa's tender portal¹. This includes tenders of all national and provincial departments, metros, district and local municipalities, public entities and State Owned Enterprises. A few examples of current tenders are shown in Table E.1.

A number of rail development opportunities are mentioned in Transnet's long-term planning framework (Transnet, 2017 – Rail chapter).

It includes the following plans for the port of Durban:

- Construct Kings Rest terminal 1a for 50 wagon lines by 2018 and 1b for 75 wagon lines by 2022;
- Decommission Pier 1 & 2 rail terminals by 2022;
- Construct Bayhead arrivals yard 1st Stage for 75 wagon lines by 2022 and the 2nd Stage by 2025;
- Construct Mainline to DDOP - Link Lines (Single) by 2022 and add the second by 2033;
- Construct Kings Rest terminal 2 and 3 by 2025 and 2029, respectively, and
- Construct Island View Upgrade Rail/Port Terminals by 2029.

Further actions include:

- Separate freight and passenger/Metro traffic as far as feasible to streamline operations and capacity;
- Develop the airport link;
- Consider new high capacity bypass line (such as Cato Ridge Bypass) to complement the Natcor line, and
- Consider 150-wagon trains on Natcor.

The projected increase in intermodal traffic will require an additional 2 million TEU handling capacity at terminals in Gauteng, where most of the intermodal traffic is handled. Three locations have been identified for the development of new intermodal terminals, namely Pyramid, Sentrara and Tambo Springs.

It is anticipated that a high-speed passenger rail service will be implemented between Gauteng and Durban in the long term. Three further strategic connections are also being considered, namely:

- Coastal Rail – rail connection from the Western Cape to KwaZulu-Natal via the Eastern Cape province;
- Sishen Link – rail link connecting the iron ore network to Gauteng, Botswana and the Waterberg coalfields using the existing West Rand to Mahikeng section, and
- Trans Kalahari – regional rail link from Walvis Bay in Namibia to link with the South African network via Botswana.

Transnet's long-term planning framework identifies the following port development opportunities over a 30-year planning period (Transnet, 2017 – Ports chapter):

¹ <https://etenders.treasury.gov.za/>

- Saldanha Bay iron ore expansion;
- Saldanha Bay ship repair precinct;
- Saldanha Bay LNG Facilities;
- Cape Town container seaward expansion;
- Ngqura/Durban liquid bulk terminal to support Project Mthombo;
- Ngqura manganese export facility;
- Durban DCT pier 1 phase 2 expansion;
- New Durban Dig-out Port (DDOP); and
- Richards Bay liquid bulk, dry bulk and break-bulk capacity expansion.

Transnet's long-term planning framework (Transnet, 2017 – Pipeline chapter) assumes that a new 300 000 bpd refinery will be commissioned at the Port of Ngqura in 2026. Two pipeline development scenarios are considered for transporting the proposed refinery's fuel to the hinterland:

- Scenario 1: Build a pipeline from Ngqura to Gauteng (NGP); or
- Scenario 2: Ship refined fuel from Ngqura to Durban and then transport it via the new 24-inch Multi-Product Pipeline (MPP24) to Gauteng.

In addition, the following new pipelines are proposed:

- Maputo to Gauteng – 25-year licence has been obtained by Petroline Holdings to construct and operate this pipeline;
- West Coast Gas Pipeline – a potential future South African gas pipeline system is envisaged that will entail pipelines from the offshore gas fields off the southern Namibian coast to Cape Town and possibly Mossel Bay, Port Elizabeth and Gauteng;
- Mossel Bay LNG Imports – various options are being investigated for the import of liquefied natural gas (LNG) to supplement the gas reserves at PetroSA's gas-to-liquid (GTL) refinery;
- Botswana Refined Fuels Pipeline – different options are considered for a new pipeline to Gaborone;
- Saldanha Bay - Atlantis LNG Imports – an LNG import terminal in Saldanha with a pipeline to the Ankerlig power station in Atlantis.

Category	Tender Description	Tender No.	Date published	Closing date & time
Professional, scientific and technical activities	Provision of a professional service provider to provide smart driver training for City of Cape Town	218C/2019/20	28/02/2020	01/04/2020 - 10:00am
Professional, scientific and technical activities	Request For Information (RFI) For The Design, Financing, Construction, Operation, Maintenance And Eventual Handover Of Developed Facilities In The Liquid Bulk Precinct Of The Port Of Ngqura, Which Are To Be Used By Successful Bidders For The Undertaking Of A Port Related Commercial Activity	TNPA2019/08/021/CM	06/12/2019	20/03/2020 - 12:00pm
Transportation and storage	RFQ Provision of Training Services for the Mobile Harbour Crane in the Port of Port Elizabeth	iCLM PE 236/TPT	27/02/2020	09/03/2020 - 10:00am

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