CHAPTER 2

FREIGHT DEMAND PLAN
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ACRONYMS AND ABBREVIATIONS

CDFM  Container Demand Forecast Model
EDM    Energy Demand Model
FDM    Freight Demand Model
FSRUs  Floating Storage and Regasification Units
GBP    Gauteng Basin Plan
HDSA   Historically Disadvantaged South Africans
IDZ    Industrial Development Zone
LNG    Liquefied Natural Gas
MDS    Market Demand Strategy
MSM    Market Share Model
MPP    Multi-product Pipeline
NIP    National Infrastructure Plan
OEM    Original Equipment Manufacturer
PICC   Presidential Infrastructure Coordinating Commission
PRC    Port and Rail Corridor
SEZ    Special Economic Zone
SRL    Swaziland Rail Link
TE     Transnet Engineering
TFR    Transnet Freight Rail
TIP    Transnet Infrastructure Plan
TNPA   Transnet National Ports Authority
TPT    Transnet Port Terminals
TTM    Transnet Transportation Model
FREIGHT DEMAND PLAN

1 INTRODUCTION

A comprehensive and reliable demand forecast is the starting point for developing a planning framework since the fundamental principle of this LTPF is the development of capacity ahead of demand.

The LTPF uses 30 year freight demand forecasts produced by the Transnet Transportation Model (TTM), which in turn is populated from a variety of forecasting models, data and commodity specific research as inputs. This chapter is a summary of the more detailed forecasts published in the Demand Book 2016 MDS Aligned that was released in April 2016 and the primary source of the capacity plans that follow.

Another demand element (new in this edition) is that of Transnet’s projected future energy demand. Energy demand is recognised as an important driver for infrastructure development and also forms the basis for long-term planning in the areas of energy source substitution and energy security risks faced by Transnet.

A Transnet-specific Energy Demand Model (EDM) was developed in 2013/14 and with the 2015 update and refinement; it was decided to include some high level results in this chapter. The intention is to show electrical capacity utilisation maps, similar to the current slot utilisation, in the rail chapter of future editions of the LTPF.

The 30 year freight demand forecasts used in the LTPF are mostly unconstrained in that they do not account for capital affordability, profitability and other business constraints. Alignment with the Corporate Plan forecasts is undertaken to assign some level of confidence on the forecasts and aligning on assumptions behind the different commodity forecasts. Alignment in this regard does not mean that the Corporate Plan and LTPF forecasts are matched.

Overall, the demand for freight transportation is expected to grow from around 825 mt to around 1 859 mt over the next 30 years. This increase of 125% is lower than the 159% expected in 2015. As a result, capacity interventions will be required later than anticipated. This increase in volumes, implies that port, rail, road and pipeline infrastructure will require significant interventions, to ensure we are enabled to capture the projected growth in volumes.

Figure 1: Growth in demand for freight transportation per sector 2015 - 2046

By 2046, mining freight will represent more than 69% of all goods transported. Manufacturing freight is expected to be about 23% and agricultural products about 8%.

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2 DEMAND PLANNING TOOLS

The demand planning methodology for the LTPF entails using a set of five models shown in Figure 2, to determine the demand for transportation of all types of freight and predicting how this demand will change over the next 30 years.

Model 1: Liquid Fuels and Gas Model (LFGM): This is a stand-alone flow model specifically aimed at improving the forecasting of commodities associated with the petroleum industry. This group of commodities are unique since the consumption drivers can be linked to economic activity but on the supply side it does not follow the simplified principles assumed in the FDM. The LFGM uses supply-side capacity intelligence and matches the fuel production forecasts with demand and then supplies the projected shortfalls with fuel product imports. The model also simulates “via” points, or redistribution terminals, which are typical for these commodities. The LFGM and FDM require a synchronisation of input assumptions and alignment of output values before it can be effectively applied by Transnet. This is to ensure that the macro-economic growth drivers are aligned on final demand. The LFGM also incorporates a number of scenarios derived envisaged dynamics within the industry such as oil and gas pricing, energy substitution and efficiencies.

Model 2: Freight Demand Model (FDM): This is the well-established freight flow and forecasting model sponsored by Transnet and developed by GAIN. The objective of this model is to consider the sources of supply and demand in the economy, disaggregated to 356 districts and 83 commodities. This model essentially translates economic activity in the form of currency (Rand) into production and consumption of goods in the form of tons.

It determines where goods are produced and consumed in an origin-destination matrix format. Forecasts are based on macro-economic growth scenarios including:

- International economic outlook;
- GDP growth and projected growth of industry sectors;
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- National capital spending;
- Population growth; and
- Various other forecasting factors.

Growth forecasts scenarios for the “high”, “likely” and “low” scenarios are independently produced by two economist firms before being modelled. The LTPF uses the “likely” growth forecast to capacity requirements while the high and low forecasts are used to monitor alignment of the Corporate Plan forecasts in terms of realism.

Model 3: Container Demand Forecast Model (CDFM): The CDFM models the movement of all containers in South Africa across five typologies namely: Marine Deep-sea (import/export), Marine Coastal (alternative to domestic surface logistics), Domestic Intermodal, Empty repositioning and Transhipment. The inputs to the model are the disaggregated origin-destination freight flows as produced by the FDM and applies parameters that emulate the market drivers unique to each of the five typologies to determine the disaggregate movement of containers. The output of the model is the flow of containers per commodity, per container type between 19 regions in South Africa. Industry engagement, data analysis and trend research have informed the parameters of the model.

Model 4: Transnet Transportation Model (TTM): The TTM is the main source of flow data and maps roughly 1 000 nodes (ports and “stations”) and 1 700 links (rail lines). The TTM “flows” the Origin-Destination (O-D) pairs obtained from the FDM, CDFM and LFGM onto the Transnet rail, port and pipeline network. The TTM uses gravity flow methodology, a well-established technique to model the flow of goods, people, and so forth. The route that freight will follow is determined by the least total resistance of the connecting links from origin to destination. It resembles the “flowing of water” through gravity.

The TTM allows Transnet planners to manipulate demand flows and add forecasts from other sources such as the mining sector. It also allows for industrial basin analysis and project specific demand scenarios to be analysed. The TTM is a bespoke demand planning tool developed in-house for Transnet’s purposes and is continually being improved, maintained and managed by Group Capital.

Model 5: Market Share Model (MSM): As an add-on to the TTM, the MSM calculates the rail addressable market (RAM) to determine rail targets over the longer-term. It uses TTM surface flows as well as the Transnet Freight Rail (TFR) “Traffic File”. By comparing planned 10-year volumes with what is available in the market, it enables planners to review the realism of short term targets and make informed longer-term projections for each commodity and on each route. Fundamental to the working of the model is the ability to analyse the parcel sizes and distances associated with each commodity on the network. Rail naturally works better for longer distances, big parcel sizes and bulky commodities.

Model 6: Energy Demand Model (EDM): The EDM is a decision-support tool that enables the analysis of different energy scenarios. It uses the LTPF and TTM outputs to link future growth to energy consumption within each operating division for the next 30 years. Due to TFR being such a significant energy user within Transnet, a more detailed approach is used for different train configurations, type of locomotives, gradients of the routes, electrical losses, etc. The EDM produces outputs per operating division, fuel source (e.g. electricity, diesel, petrol, gas etc.), activity type (e.g. rail movements, port movements) and location.
3 DRIVERS OF DEMAND

3.1 GDP AS THE PRIMARY DRIVER OF THE FORECAST:

A critical input for the FDM and LFGM is economic projections of the disaggregated GDP, translated into a freight flow output. The GDP for 2014 grew by 1,5% and a lower growth of 1,3% was experienced in 2015.

The figure below reflects historical and forecasted Real GDP Growth since 1994 for Sub-Saharan Africa, South Africa and the world.

South Africa’s economic growth is strongly aligned to global economic growth. This has been the status quo since 1994 (when the world economy opened up for renewed trade with and investment in South Africa) up to 2007. However, since 2009 a discrepancy developed between the growth rates of the world economy and that of South Africa, with South Africa underperforming the world economy by about 1½ percentage points.

It is expected that the gap of these two growth rates will remain at 1½ percentage points over the medium-term, with a bias towards a widening growth gap in the short-term.

Since the democratisation of South Africa in 1994, the country has become a major role player in the economic development of Sub-Saharan Africa as a service and manufacturing hub. The economic forecast underpinning the Freight Demand Forecasts is based on a belief that South Africa will enhance this role in future. The resultant impact of this is that declining export growth in the primary sector, more specifically basic minerals, can to a large extent be compensated for by the exports of manufactured goods and services to Africa. It is important to note that this will not only affect the volume of exports, but the composition of exports as well. This implies that a much higher volume of exports will be transported via inland border posts to other African countries further north. This will also have an important bearing on the infrastructure of the South African harbours, especially those on the East Coast that provide connections to other SADC countries.


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### 3.2 WORLD ECONOMIC GROWTH PROSPECTS:

World economic growth struggled to grow at rates prior to the ‘Great Recession’ of 2007/08. Registering no growth in 2009, global growth increased to 5.4% in 2010, but started to slow down since 2011. At present, the International Monetary Fund (IMF) estimates that global growth slowed down to 3.1% in 2015 and forecasts 3.2% in 2016 but could increase slightly to 3.5% by 2017. In the medium-term (2020), growth could reach 4% p.a. However, this growth could probably be unevenly spread throughout the world.

Sub-Saharan Africa is expected to reach growth of close to 5% p.a. by 2020, which will mainly be derived from and depend on the performance of the more advanced economies. Trade and capital flows should serve as the key transmission mechanism for growth in developing and emerging economies. Some viewpoints include that the long-term (25 to 30 year) commodity cycle has already peaked, could be detrimental to Africa’s economic growth and development prospects over the short to medium-term.

### 3.3 OUTLOOK

The following is worth noting, from an optimistic perspective:

- According latest consensus views, forecasted global economic growth could increase to 3.5% by 2017. In the medium-term (2020), growth could reach 4% p.a. However, this growth will be unevenly spread across the world.
- South Africa has become a major role player in the economic development of Sub-Saharan Africa as a service and manufacturing hub. Sub-Saharan Africa economy is expected to remain among the fastest growing economies of the world, albeit from a relatively low basis.

South Africa will eventually benefit from the following developments:

- Gradual recovery in commodity prices from 2016, this could stabilise the mining and basic metal sector.
- Major infrastructural investments by the public sector are occurring, specifically with regard to the energy sector. This should ultimately stabilise South Africa’s electricity shortage in the medium-term.
- Transnet’s envisaged investment spend over the short – medium term will further unlock and optimise SA’s wealth of mineral resources.

It is important to re-emphasize that even in the face of severe short-term challenges, one should not be deterred from taking into account the growth opportunities that the country is offering over the medium- to long-term.

It is forecasted that the South African economy will grow at the following growth rates over the period 2015-2045:

- Likely scenario: 3% p.a.
- High scenario: 4.1% p.a.
- Low scenario: 2.1% p.a.

### 3.4 TRADE (IMPORT AND EXPORT):

South Africa has a very open economy, with total trade (imports and exports) contributing more than 60% to the GDP of the country. Both imports and exports have grown exponentially since the democratisation of the country in 1994. Whilst the global financial crisis of 2008 has temporarily led to a decline in trade, the long-term growth trend resumed almost immediately thereafter.

The rapid change in South Africa’s trading pattern is of particular interest. On both the import and export side South Africa’s trade with other Emerging Markets has grown exponentially, whilst trade with the developed world has moderated quite considerably. In most cases trade with the emerging markets has been growing at 20% plus p.a. over recent years, whilst trade with the developed world has seen growth of below 10% p.a.

Trade with China has seen unprecedented growth, making it South Africa’s largest trading partner for both imports and exports. On the exports side it has been driven mostly by commodity exports and on the import side by manufactured goods.
3.5 INTERNATIONAL TRADE: SOUTH AFRICA AS THE GATEWAY TO AFRICA:

Since the democratisation of South Africa in 1994, the country has become a major role player in the economic development of Sub-Saharan Africa as a service and manufacturing hub. The economic forecast made in this outlook is based on a belief that South Africa will enhance this role in future. The resultant impact of this is that declining export growth in the primary sector, more specifically basic minerals, can to a large extent be compensated for by the exports of manufactured goods and services to Africa. It is important to note that this will not only affect the volume of exports, but the composition of exports as well. This implies that a much higher volume of exports will be transported via inland border posts to African nations further north. This will also have an important bearing on the infrastructure of the South African harbours, especially those on the East Coast that provide connections to other SADC countries.

From 2000 to 2013, the 17 countries covered in the Regional Freight Demand Model (RFDM), excl. South Africa, recorded exceptional growth. The global financial and economic crises during 2008/2009 caused only a brief slowdown in the economic growth of the region relative to the rest of the world and that of South Africa. According to the World Bank statistics, the combined Gross Domestic Product (GDP) growth rate of these selected countries (excluding South Africa) stood at 8.1% in 2014.

The RFDM currently forecasts that the GDP growth of the 17 selected Sub-Saharan countries will slow down substantially over the short term due to the world wide dipping in the demand for commodities. However, over the medium to the long-term there is no reason that higher growth rates should not eventually be restored, driven by investments, specifically the advanced economies and emerging and developing Asian countries, to exploit the region’s natural resources. The region attracted foreign direct investment worth a “near-record” US$43bn in 2014, up 16 % from a year earlier, brought about by oil and gas discoveries in countries such as Angola, Mozambique and Tanzania (World Bank, 2015).

3.6 COMMODITY PRICE CYCLE:

International commodity prices were in a deep trough and had dwindled on an index basis from as high of 190 in 2012 to 60 in late 2015. This translates into a decrease of nearly 68% over 3 year period.

This had a devastating effect on South Africa, as the economy is heavily reliant on basic commodity exports. The impact involves (but not limited to) mines loosing viability, production growth prospects diminish (Cost vs. Price) and volumes flatten out in short to medium term.

![IMF Commodity Price Indices](image)
3.7 POPULATION GROWTH:

One of the key factors underlying the science and practice of forecasting economic growth is the underlying assumption of expected positive population growth. Population growth per se has a significant causal relationship with overall economic growth such as its influence on private consumption expenditure and the growth of the economically active part of the population serving as the supply of labour.

The world population growth is currently 1.2% p.a. The annual growth rate is currently declining and is projected to continue to decline in the coming years. Currently, it is estimated that it will become less than 1% by 2020 and less than 0.5% by 2050.

The Sub-Saharan population was about 397 million in 2014. According to the population growth figure, the Sub-Saharan Africa population is growing much faster than the world population.

The current growth rate of the population of South Africa is ± 1.6% p.a. This is a slight improvement on the decline from 2.5% p.a. in 2000 to a low of 1.3% p.a. in 2003. The NDP forecasts population growth at 1% for the medium-term and 0.5% for the long-term. According to the Freight Demand Model (FDM, 2016), a growth rate of 1.5% p.a. over the 30 year forecast period is assumed to be reasonable. This growth rate is based on an assumption of an improved situation in combating HIV in future, as well as the expectation that the illegal inflow of foreigners will stabilise.

3.8 FIXED INVESTMENT:

The National Development Plan (NDP) of 15 August 2012, aims at doubling the real average economic growth rate to 5.4% p.a. for the period 2012 to 2030. To achieve this, Government will have to facilitate substantial improvements in a number of areas. Amongst these is the fixed investment in economic infrastructure to serve as basis for future economic growth. The NDP assumes that fixed investment will increase to a level of 30% of GDP by 2030 (currently 20%) with the public sector (general government and government enterprises) investment reaching 10 percent of GDP, to realise a sustained impact on economic growth and social services. Financing these endeavours will depend on the availability of local as well as foreign financing. However, South Africa’s inadequate savings ratio of around 15% of GDP in 2015, translates into a large dependence on foreign long-term capital to achieve the NDP investment goal.

Major infrastructural investments are currently being undertaken by the public sector. Although it is long overdue, Eskom is currently investing substantial amounts in expanding power generation capacities such as Medupi and Kusile power stations and through Private Renewable Energy Sources such as solar and wind energy. Ultimately this should stabilise South Africa’s electricity shortage in the medium term.

According to Transnet’s Market Demand Strategy, an investment budget of approximately R277.8bn over seven years starting 2015/16 up to 2021/22, is envisaged. As a major player in the South African transport industry, Transnet needs to optimise its investment in the South African economy, to be efficient and effective. Primarily, transport (specifically rail and ports as an economic infrastructural service) has a developmental function. For the South African economy to achieve optimal sustainable growth over the longer-term, it needs to further unlock and optimise its wealth of mineral resources.

4 INDUSTRIALISATION SCENARIOS

4.1 INTRODUCTION

The likely scenario reflects both South Africa’s official development plan and the best estimate of what can be achieved, given the capacity that is currently created in the economy. It is well known that South Africa’s current prospects are insufficient to achieve the growing employment and development growth targets of the country. This position will affect freight flows, required infrastructure and capacity planning for the future.

The question could be asked that given this specific raw material export configuration that is planned for, what the impact would be on accelerated beneficiation and industrialisation in general, if the necessary production factors could be found to make it work. Will the infrastructure and logistics systems configuration then be a major bottleneck, specifically because too much emphasis was placed on mineral exports? In order to answer these and related questions certain industrialisation scenarios were developed which attempt to illustrate these impacts. These scenarios are based on a group of projects that are deemed the
most likely out of a broader group of considered projects.

4.1.1 INDUSTRIALISATION’S ROLE IN MANUFACTURING

Aptly, the overriding goal of the Government's Industrial Policy Action Plan (IPAP) is to prevent industrial decline and support the growth and diversification of South Africa's manufacturing sector. Manufacturing is seen as critical to the South African economy and it can be used to create new sustainable growth through the diversification of the economy. This can lead to productive, active and inclusive higher levels of advanced manufacturing, including broader industrialisation, as well as beneficiation. Indeed, South Africa needs to move up the value chain and diversify its economy.

4.1.2 APPROACH

The industrialisation scenarios therefore considered a range of alternate projects not included in the Freight Demand Model (FDM). These are not included in the forecast, because as stated, it is believed that the necessary capacity in the economy around especially the availability of finance, skills and entrepreneurship does not exist to execute these over the short-term. It is, however, stated economic policy to pursue industrialisation and it has to be considered that in the medium-term an outside chance might present itself to pursue these opportunities. Therefore, in the light of the importance of the issue and the attention that it currently receives, the work was deemed necessary.

The scenarios attempted to illustrate the impact of these “most likely of unlikely projects” on the logistics infrastructure configuration, especially in terms of demand. It seeks to determine if bottlenecks could result by determining increases and decreases of specific commodities’ volumes. The potential impact of these projects on transport flows in the country were therefore modelled by type of mode (road, rail, pipe), and the output tabled at the end of this section.

It must be stressed that Transnet has neither committed to providing infrastructure for these projects, nor is it suggesting that these projects be considered for implementation, the work is therefore only illustrative in nature. The value of the exercise lies in its application for forecast purposes and long-term planning as it relates to transport infrastructure in South Africa. It enables planners to answer questions regarding flow impacts, capacity availability and possible infrastructure limitations if these projects were to be considered. It also serves as an illustration of how logistics infrastructure demand planning could be used when new industrial projects are considered.

4.1.3 PROCESS

35 potential beneficiation projects were initially identified, whilst 21 were selected for further investigation on the basis that they met most of the following criteria: (1) Significant potential impact on the economy of the country; (2) The project is in the public domain and some sources of information exist; (3) Is viable in terms of finance and the supply of sufficient raw materials to beneficiate; (4) The knowledge-base that could secure the successful implementation of such a project exists or can easily be acquired.

4.2 INDUSTRIALISATION PROJECTS INCLUDED IN THE SCENARIOS

4.2.1 FERROMANGANESE SMELTER

It is assumed that a ferromanganese smelter will be built at Coega, producing high carbon ferromanganese.

**Impacting freight movements:**
- Export manganese from Kuruman exported at the port of Port Elizabeth will decrease.

**Inbound freight movements:**
- Manganese from Kuruman to the smelter.
- Dolomite and limestone from Postmasburg to the smelter.
- Coal from Ellisras to the smelter.
- Electrodes imported at the port of Port Elizabeth.

**Outbound freight movements:**
- Ferromanganese from the smelter exported at the port of Port Elizabeth. Total transport demand is not impacted.
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much. Some additional bulk capacity requirements for rail on the export line, as well as a little additional traffic on SouthCor.

4.2.2 OEM VEHICLE PLANT (NELSON MANDELA BAY AREA)

Given the already critical mass that exists in the Nelson Mandela Bay Metro, it is assumed that a true “Motor City” will develop in the area based on projects that will deliver additional capacity in car, truck and component manufacturing. This will result in the following flows:

Impacting freight movements:

- Steel exports from Vanderbijlpark exported at the port of Durban will decrease.
- Motor vehicles imported at the port of Durban for Gauteng will decrease (±81 000 vehicles).

Inbound freight movements:

- Steel from Vanderbijlpark to the OEM plant.
- Steel imported at the port of Port Elizabeth for the OEM plant.

Outbound freight movements:

- Motor vehicles from the OEM plant to Gauteng (±81 000 vehicles).
- Motor vehicles from the OEM plant to be exported at the port of Port Elizabeth (±54 000 vehicles).

Spin-off freight movements:

- Motor vehicle parts from Coega will be exported at the port of Port Elizabeth.
- Total transport demand is not impacted much. Mostly a small switch of freight from a high-density corridor (NatCor) to a low-density corridor (SouthCor).

4.2.3 CRUDE AND GAS REFINERY (COEGA)

It is assumed that a crude refinery will be built at Coega, using imported crude oil to produce fuel to satisfy the predicted future shortfall in the country (project Mthombo). Only spin-off flows were considered, as this refinery is part of an already considered fuel strategy.

Spin-off freight movements:

- Chemicals from the Coega refinery exported at the port of Port Elizabeth.
- Total transport demand is not impacted significantly. Increased export volumes at Port Elizabeth.

4.2.4 COPPER AND COBALT BENEFICIATION

It is assumed that the useful life of the Palabora Mining Company Ltd (Phalaborwa district, Limpopo) will be extended by importing copper and cobalt concentrate from the Democratic Republic of the Congo for final refining in South Africa.

Impacting freight movements:

- Copper ore and cobalt from Beitbridge border exported at the port of Durban will decrease.

Inbound freight movements:

- Copper and cobalt ore from Beitbridge border to Phalaborwa.

Outbound freight movements:

- Copper and cobalt (both more refined) from Phalaborwa exported at the port of Durban.
- This project will lead to a very slight decrease on NatCor, and is in fact just a rerouting and stop-over of copper
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from the copper belt.

- Cobalt from Beitbridge border exported at the port of Durban will decrease by 177 000 tons (road)

Inbound freight movements:

- Copper ore from Beitbridge border to Phalaborwa, 88 500 tons (road)
- Cobalt ore from Beitbridge border to Phalaborwa, 177 000 tons (road)

Outbound freight movements:

- Copper (more refined) from Phalaborwa exported at the port of Durban, 79 650 tons (road)
- Cobalt (more refined) from Phalaborwa exported at the port of Durban, 159 300 tons (road)

This project would lead to a very slight decrease on NatCor, and is in fact just a rerouting and stop-over of copper from the copper belt.

4.2.5 TSHIAME DEVELOPMENT AT HARRISMITH

The project (linked to a planned SEZ and the Harrismith Logistics Hub), encompass an intermodal rail based container terminal, car terminal, a vehicle distribution centre and bonded warehousing facilities. Further opportunities will be created for the up- and downstream automotive, agriculture, food processing, pharmaceutical, ICT & BPO, aqua-culture and general processing sectors, resulting in the following flows:

Impacting freight movements:

- The movement of food, beverages, textiles, chemicals, electrical and transport equipment from Durban to Germiston will decrease.

Inbound freight movements:

- Maize from Bothaville, rice from port of Durban, fruit from Inanda, chemicals from Durban, electrical and transport equipment from port of Durban.

Outbound freight movements:

- Movement of processed food, beverages, textiles, chemicals, electrical and transport equipment to Germiston.

4.2.6 DUBE TRADE PORT

Recently declared an IDZ, the project is a purpose-built Aerotropolis around the King Shaka International Airport and in close proximity to the Durban and Richard Bay harbours. In addition to its logistics proposition, it will be developed to include an initial focus on aerospace and aviation-linked manufacturing, agriculture and agro-processing, electronics manufacturing and assembly, pharmaceutical production and distribution, clothing and textiles.

Inbound freight movements:

- Maize from Pietermaritzburg, rice from the port of Durban, fruit from Carolina.
- Chemicals, electrical and transport equipment from Durban.

Outbound freight movements:

- Food to Durban.
- Beverages, textiles, printing and publishing, paper, chemicals, electrical equipment, vehicle components and Other Manufacturing to the port of Durban.
4.2.7 TSHWANE AUTOTROPOLIS

Creating an Autotropolis/Automotive corridor and logistics node in Tshwane, further building on the extensive automotive cluster (comprising OEM’s, component manufacturers and an Automotive Supplier Park), that already exist in the area.

**Impacting freight movements:**

- Steel exports from Vanderbijlpark exported at the port of Durban will decrease.
- Motor vehicles imported at the port of Durban for Gauteng will decrease.

**Inbound freight movements:**

- Steel from Vanderbijlpark to the OEM plant.
- Steel imported at the port of Durban for the OEM plant.

**Outbound freight movements:**

- Motor vehicles from the OEM plant to Gauteng.
- Motor vehicles from the OEM plant to be exported at the port of Durban.

**Spin-off freight movements:**

- Motor vehicle parts from the OEM plant will be exported at the port of Durban.
- Motor vehicle parts from the OEM plant to Gauteng.

4.2.8 EKURHULENI AEROTROPOLIS

Developing world class aircraft maintenance and aviation facilities, multimodal transport facilities, offices, hotels, retail stores, conference facilities and high-density residential developments. This will result in an increase of inbound freight flows of Metal Products, machinery and electronic equipment from the port of Durban.

5 MACRO FORECASTING RESULTS

The figures below represent the production distribution (supply and demand) of the three major freight sectors namely agriculture, mining and manufacturing. It shows where goods are produced, mined or imported as well as where it is consumed or exported. The total demand and supply of the South African system should be in balance at all times and this is an important principle to ensure the integrity of the forecast projections.
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FIGURE 5: AGRICULTURAL FREIGHT – AREAS OF SUPPLY AND DEMAND

2015
Production = 75.5 mt
Imports = 4.4 mt
Total Supply = 80.0 mt

2015
Consumption = 77.9 mt
Exports = 2.0 mt
Total Demand = 80.0 mt

2046
Production = 141.5 mt
Imports = 9.7 mt
Total Supply = 151.2 mt

2046
Consumption = 144.5 mt
Exports = 6.7 mt
Total Demand = 151.2 mt
FIGURE 6: MINING FREIGHT – AREAS OF SUPPLY AND DEMAND

2015
Production = 450.6 mt
Imports = 26.0 mt
Total Supply = 476.6 mt

2015
Consumption = 387.2 mt
Exports = 89.4 mt
Total Demand = 476.6 mt

2046
Production = 1 113.5 mt
Imports = 53.7 mt
Total Supply = 1 167.2 mt

2046
Consumption = 1 033.3 mt
Exports = 133.9 mt
Total Demand = 1 167.2 mt
FIGURE 7: MANUFACTURING FREIGHT – AREAS OF SUPPLY AND DEMAND

2015
Production = 167.9 mt
Imports = 20.5 mt
Total Supply = 188.4 mt

2015
Consumption = 164.6 mt
Exports = 23.8 mt
Total Demand = 188.4 mt

2046
Production = 385.9 mt
Imports = 45.4 mt
Total Supply = 431.3 mt

2046
Consumption = 384.2 mt
Exports = 47.1 mt
Total Demand = 431.3 mt
5.1 SOUTH AFRICA’S TOTAL SURFACE DEMAND

Total freight on the South African surface is envisaged to increase from around 825 mtpa to around 1 859mtpa. Flows through the port system will increase from 223mtpa to 390mtpa, while cross-border traffic from 31mt to 70mt. As a result, freight flows on the surface of RSA are expected to grow significantly as illustrated below.

Figure 8: 2015 Total freight flows per corridor/port and direction

Figure 8: 2046 Total surface flows per corridor/port and direction

General Freight Business (GFB) is pre-dominantly focused on two corridors (the Cape corridor and the Durban to Gauteng corridor). The highly densified export corridors for coal and iron ore is expected to remain more or less stable with some growth on the Northern Cape to the Port Elizabeth/Ngqura port system.
FREIGHT DEMAND PLAN

5.2 RAIL, PORT AND PIPELINE DEMAND

Note: It is important to note the following aspects whenever attempting comparisons between LTPF and MDS forecasts:

- LTPF is based on calendar years (January to December), while the MDS uses financial years (April to March); and
- MDS forecasts (7 – 10 years) are used for strategic (seven-year Corporate Plan) planning and intended for planning business operations and budget requirements in anticipation of customer demand, while the LTPF is a long-term (30-year) unconstrained forecast based on macroeconomic considerations and is intended to provide a planning framework for capacity expansions and to identify any possible blind-spots or market instability.

5.2.1 RAIL

One objective of the LTPF is to set a growth path for rail to capture market share and subsequently enable the setting of capacity development timeframes to ensure capacity is created ahead of demand. Rail forecasting is significantly more complex than for ports and rail freight demand processing faces several challenges including: (a) rail flows can follow a variety of alternative routes; (b) rail competes with other modes such as road and pipelines and (c) not all freight on the surface of South Africa is suitable for rail. For this reason, the MSM model is used to first do market segmentation based on distance distributions, parcel sizes and commodity suitability. From this processing we derive the Rail Addressable Market (RAM), which is the portion of the total transportable surface which is deemed to be suitable for rail to compete in (RAM also represents competitive road volumes it is unlikely that Rail will ever achieve 100% market share).

To be more accurate, market share analysis should ideally be undertaken in ton per km (ton/km) rather than tons since the average distance of rail and road consignments are significantly different. Rail currently accounts for 37.6% of all surface ton/km in 2015. If the road-suitable component is excluded, i.e. the Rail Addressable Market (RAM) is considered, rail’s market share was 55.7% in 2015, growing gradually in tandem with the total surface growth rate throughout the forecast period.

Figure 9: Rail market share projection
A percentage breakdown of rail freight by commodity type is shown below in Figure 10.

Coal mining and iron ore exports account for about 62% of the total freight moved by rail. In these cases rail has an almost 100% market share. Refer to both Tables 1 and 2 and Figure 11 to view the growth opportunities identified in the major commodities nationally and per major corridor.

<table>
<thead>
<tr>
<th>Volumes (mtpa)</th>
<th>LTPF 2015</th>
<th>LTPF 2026</th>
<th>LTPF 2046</th>
</tr>
</thead>
<tbody>
<tr>
<td>General freight</td>
<td>46.4</td>
<td>68.1</td>
<td>179.5</td>
</tr>
<tr>
<td>Coal export</td>
<td>80.1</td>
<td>90.3</td>
<td>110.1</td>
</tr>
<tr>
<td>Iron ore export</td>
<td>59.7</td>
<td>61.0</td>
<td>73</td>
</tr>
<tr>
<td>Manganese export</td>
<td>7.4</td>
<td>11.8</td>
<td>22.4</td>
</tr>
<tr>
<td>Coal (Domestic &amp; Eskom)</td>
<td>15.7</td>
<td>29.3</td>
<td>32.6</td>
</tr>
<tr>
<td>Iron ore (Domestic)</td>
<td>7.6</td>
<td>8.9</td>
<td>10.9</td>
</tr>
<tr>
<td>Manganese (Domestic)</td>
<td>2.1</td>
<td>1.9</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>219</strong></td>
<td><strong>271</strong></td>
<td><strong>431</strong></td>
</tr>
</tbody>
</table>

Table 1: High level LTPF 2015 forecast per broad rail commodity groups
Table 2: Rail flows per commodity on all major routes for 2015, 2026 and 2046

It must be recognised that mineral exports are also the most unpredictable of all commodity classes and volumes in the long-term are heavily influenced by international markets and a variety of supply side factors. With the current state of the country’s major mineral export prices and international dynamics, caution must be taken when utilising any of these long-term forecasts and other efforts in research and consultation need to be embarked on in this regard.

5.2.2 PORTS

The nine South African ports that fall under the custodianship of Transnet, as per the National Port Regulations of 2007, include: Port Nolloth, Saldanha Bay, Cape Town, Mossel Bay, Port Elizabeth, Ngqura, East London, Durban and Richards Bay.

Port forecasts are typically expressed by groupings of commodities that reflect the infrastructure required in a port to handle such commodities. Figure 12 displays the overall forecast of all the ports by package type flowing through the ports.
Table 3 and Figure 13 provide a high level LTPF 2015 port forecast per Package Type.
FREIGHT DEMAND PLAN

<table>
<thead>
<tr>
<th>Package type (mtpa)</th>
<th>LTPF 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
</tr>
<tr>
<td>Liquid bulk</td>
<td>30.89</td>
</tr>
<tr>
<td>Other Dry bulk</td>
<td>25.85</td>
</tr>
<tr>
<td>Export Coal</td>
<td>78.66</td>
</tr>
<tr>
<td>Export Iron Ore</td>
<td>61.16</td>
</tr>
<tr>
<td>Export Manganese</td>
<td>9.95</td>
</tr>
<tr>
<td>Break bulk</td>
<td>8.56</td>
</tr>
<tr>
<td>Containers</td>
<td>27.46</td>
</tr>
<tr>
<td>Automotive</td>
<td>1.04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>243.57</td>
</tr>
</tbody>
</table>

Table 3: High level LTPF 2015 forecast Port forecast per Package Type

Not all ports are able to accommodate all commodity types and based on the particular port profile, expansion options may be limited.

### 5.2.2.1 SA PORT PROFILES:

**The Port of Saldanha** is South Africa’s deepest draft port and handles around 68 million tons of cargo per year (478 vessel calls), with the 30-year forecast predicting around 82 million tons of cargo per year. The iron ore export jetty provides berthing for two Very Large Bulk Carriers as well as one liquid bulk berth for Very Large Crude Carriers for the import of crude oil. The port has iron ore stockpiles on reclaimed land, a multi-purpose terminal with four berths and ship repair facilities for offshore rig servicing and fabrication.

**Port of Cape Town** is an established port in the Western region, providing container, bulk and general cargo handling services to the Western Cape and its largely agricultural hinterland. The port handles around 8 million tons of cargo per year (2291 vessel calls), with the 30-year forecast predicting around 16 million tons of cargo per year. The port provides much-needed ship repair services in the Western Cape region.

**Mossel Bay Port** is home to a local fishing fleet and also serves recreational boaters. There is very limited freight handling in the port, though 1.1 million tons per year are handled through the CBM and SPM. The port handles around 159 vessel calls a year, the majority of which are small, around 120m in length. The current infrastructure capacity is sufficient to meet demand forecasts over the next 30 years. There is a small waterfront and the port plans to commercially develop vacant Transnet land adjacent to the port and CBD.

**Port of Port Elizabeth** is an established port in the central region, and handles containers, manganese ore, vehicles and general cargo. Demand for cargo handling is for automotive and agricultural products in the Nelson Mandela Bay Metro and the Eastern Cape interior, manganese exports from the Northern Cape and refined petroleum products for regional consumption. With the new port of Ngqura becoming operational, the role of Port Elizabeth is changing from being the primary central port to one providing niche services in support of Ngqura. PE handles around 8 million tons of cargo per year (759 vessel calls).

**Ngqura Port** is the newest SA port. The port handles around 2 million tons of cargo per year (483 vessel calls), with the 30-year forecast predicting around 28 million tons of cargo per year. The role of the port has evolved. It remains to serve as a deep-water port for IDZ tenants as well as providing cargo handling capacities beyond the limitations of neighbouring ports. The current plan is that Ngqura will handle container cargoes, and be positioned to handle overflow Gauteng cargoes as well as targeting transhipment cargoes.
FREIGHT DEMAND PLAN

**East London Port** primarily handles industrial and agricultural cargoes, with a particular focus on servicing the local automotive industry. The port handles around 1.6 million tons of cargo per year (536 vessel calls), with the 30-year forecast predicting around 3 million tons of cargo per year. The port, because of its location, is restricted in both width and depth with limited opportunities for future port expansion. Containers and break bulk cargoes are handled on the east bank, with dry and break bulk cargoes and vehicles handled on the west bank of the river.

**Durban Port** handles 3,789 vessel calls per year, (about 55 million tons of cargo). The 30-year forecast predicts around 137 million tonnes of cargo per year. Major growth areas for the port are seen to be in containers, bulk liquid handling and break-bulk cargoes. Liquid bulk handling is expected to grow from around 23 million tonnes in 2015 to 34 million tonnes in 2046 and containers are expected to grow from around 19 million tonnes to 65 million tonnes over the same period. Note: There is no separate forecast for the proposed Durban dig-out port. The FDM considers both ports to be part of the same system. Planners will need to allocate volumes to individual ports (and terminals) in their capacity plans; and

**Richards Bay Port** is the largest port in South Africa by tonnage, handling around 101 million tons of cargo per year (1,445 vessel calls), which equates to 40% of South Africa’s total port demand. The 30-year forecast predicts around 158 million tons of cargo per year, of which export coal constitutes 68% (108 million tonnes). Major growth areas for the port are seen to be dry bulk and break bulk cargo handling. Bulk operations in the port currently focus on four major activities: export coal, dry bulk, break bulk and liquid bulk.

<table>
<thead>
<tr>
<th>Imports</th>
<th>Port Name</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTPF 2016</td>
<td>LTPF 2016</td>
<td>2015</td>
</tr>
<tr>
<td>2015</td>
<td>2026</td>
<td>2046</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>38</td>
<td>50</td>
<td>102</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

*Table 4: LTPF 2015 forecasted total imports and exports per port for 2015, 2026 and 2046*

5.2.3 **PIPESLINES AND LIQUID FUELS**

The liquid petroleum and gas forecasts are informed by the “most likely scenario” from the Liquid Fuels & Gas Model (LFGM). The low and high bands were derived based on specifically constructed high and low “scenarios” taking into consideration the reigning and future envisaged dynamics within the industry and certain defined shocks.

The total expected increase in refined fuels demand in South Africa is expressed in Figure 14, with jet fuel and other fuels demand growing the fastest. The largest demand sectors that have been identified are light vehicles, trucks, air traffic, mining, agriculture and residential.
When it comes to liquid fuels forecasting, it is also important to take into consideration the trend of gradual substitution of Petrol with Diesel. In Figure 16 below, this gradual substitution is clearly illustrated by the ratio of petrol v diesel since the 1950’s. Final demand for diesel exceeded petrol for the first time in 2013.
FREIGHT DEMAND PLAN

In order to meet the demand for fuels, South Africa will need to supplement local supply with imports as it will not have sufficient refining capacity over time until Mthombo comes on board.

Although there is no certainty currently regarding the proposed Mthombo Refinery (at Coega, Eastern Cape), this development was included in the most likely scenario of the Demand Book. In this edition of the LTPF, we assume an implementation date of 2025.

What is unclear at this stage is whether a pipeline will be built to supply Gauteng from the Mthombo refinery or whether product will be shipped via Durban and then transported via the MPP24 to Gauteng. Since these two alternatives have very different and far-reaching impacts on Transnet’s port and pipeline demand, both alternatives were analysed.

The following assumptions apply:

- A new refinery (Mthombo) is built at Coega by 2025 – commissioning capacity (288 thousand barrels per day (tbd) or at 80% turndown capacity) from assumed full capacity (360tbd);
- A pipeline running from Coega to Bloemfontein, Kroonstad and beyond (tying into the existing inland new MPP24 network) is commissioned in the same year; and
- Clean Fuels II upgrades and expansion (2018) – only Natref and Sapref assumed to expand during upgrades. Indications are that the Clean Fuels II requirements implementation date may also be deferred and will be included in future scenarios in the event that the information subject to information availability).

Figure 15 shows the total SA liquid fuels final product demand and supply. This is broken down into imported and local supply. The total liquid fuel demand and supply LTPF 2016 forecast is contextualised with the supply side in the graph by providing a view of the South African production output levels (including the new Mthombo refinery) and imports required to meet the projected demand. South Africa will become a net exporter of liquid fuel products after the introduction of the new refinery up to approximately 2028/29, after which demand will again be in excess of the domestic supply capacity, provided no other developments materialise in this period.

Figure 16: Total SA liquid fuel final product demand and supply
FREIGHT DEMAND PLAN

From the total SA liquid fuels final product demand from 2014 to 2045, it is clear that diesel is the one product that will show significant growth for the next 30 years, see Figure 17.

Figure 17: Total SA liquid fuel final product demand

The bulk of intermediate products (crude and components) as well as gas (NG and MH4) is mainly transported via pipeline and condensate (from Mossel Bay) by ship. The following assumptions were applied for these products:

- Crude oil demand is based on refinery production assumptions;
- Natref, Sapref and Enref crude requirements are imported through Durban’s SAPREF single buoy mooring (SBM);
- Chevref crude requirement is imported through Saldanha and transported by pipeline to Cape Town;
- Condensate demand used as feedstock to the refinery is based on PetroSA data;
- Components demand at Sasolburg ex Secunda was based on Sasol data; and
- LPG demand is extrapolated from Sapia data and multiplied by a factor of 1.2 to cater for Afrox demand not reflected in reported sales volumes.
6 KEY COMMODITIES

6.1 EXPORT COAL

The demand for coal is driven primarily by energy and secondary by steel production. Even though coal is expected to lose energy market share in the long-term, a 27-28% share is assumed to prevail for the next 30 years. Of the total marketable coal in South Africa, some 29% is exported. The Richards Bay Coal Terminal (RBCT) handles the vast majority (95%) of South Africa’s coal trade although smaller tonnages do move through Durban and Maputo.

According to CRU’s Thermal Coal Market Outlook - March 2016, total thermal coal demand increased 0.5% y/y in 2015 and they forecast for total growth in 2016 is 0.7% y/y. Between 2016 and 2020, it is expect global demand will grow at a CAGR of 0.2%, but demand in China is forecast to fall at a CAGR of 1.9%, due to slowing growth of electricity consumption and an increasing share of non-thermal generation.

![Figure 18: Export coal rail forecast](image)

6.2 EXPORT IRON ORE

Global demand for iron ore is strongly linked to the global steel industry and, more specifically, to steel manufacturing output in China. China is by far the largest importer of iron ore from South Africa. Export volumes have increased steadily in the last 10 years up to the current 59.7 mtpa.

South Africa’s total reserves amount to 9% of world reserves (the 6th largest in the world), but currently 2000 Mt reserves in Northern Cape are expected to be depleted by 2033. South African Iron ore is regarded as one of the highest qualities available due to the exceptionally high iron content - at 65%.
The projected Export Iron Ore on rail is depicted in the figure below.

![Figure 19: Export iron ore rail forecast](image)

Weaker demand from top consumer China and burgeoning supply growth, notably in Australia and Brazil, have hurt the industry over the past three years. Prices have retreated to historical levels, with iron-ore ending 2015 below $40/t, from a high of $191/t in 2011.

The growth forecast for iron ore in the LTPF up to 2033 was assumed to be constrained due to port and rail capacity. It can therefore grow significantly should capacity be released.

### 6.3 EXPORT MANGANESE

Manganese ore demand is strongly linked to demand for steel, thus China expectedly has a high demand for manganese. This is one of South Africa’s richest raw resources being ranked first in the world in quality with approximately 80% of worldwide high-grade manganese reserves. South African reserves are located in the Northern Cape, just south of Postmasburg to the Wessels and Black Rock Mines of Hotazel.

Currently, a total of 7.4 mtpa of manganese ore is exported from SA through Port Elizabeth, Durban and Richards Bay through a combination of bulk and container services on rail and road. Various bridging capacity projects will be implemented to accommodate the envisaged demand up until 2018.

Despite the displacement of Chinese Manganese ore production, the industry still faces a battle in balancing supply with much weaker demand expectations. The 2020 price forecast of $3.30 dmtu, CIF China, reflects an ongoing margin squeeze for miners in the fourth quartile of the cost curve.
90% of manganese is used in steel production, while the balance is used in the production of metal alloys, chemicals and electronics. Steel and Manganese demand growth has been slowing down in recent years. Global seaborne volumes should on average decline in 2016, but rise slowly thereafter with an expected jump in 2019/20 due to SA export expansion.

6.4 POWER STATION COAL

The bulk of the saleable coal produced in South Africa is consumed within the country by the electricity generation sector, which accounted for 65% of total domestic sales in 2015. With units of Eskom’s Medupi and Kusile power stations coming on stream sometime in 2015 and with the electricity utility mulling the so-called Coal 3 power station, local demand for coal from the electricity generation sector is expected to remain buoyant for many years.
Freight Demand Plan

Figure 21: Power Station Coal rail forecast

Peak demand in Power Station coal is expected in 2025 at around 20.4mt. With the expected mine closures over time and new power stations being fed by conveyor belt, the long-term growth is expected to be around 14mt in 2046. Railable growth in this sector is therefore negative after 2026.

6.5 Magnetite

Similar to iron ore, the demand for magnetite is currently driven by Chinese steel production. With the future outlook on steel production set to grow over the long-term, it is expected that magnetite demand will grow in relative terms. In the short to medium term however, demand appears to be suppressed, hampered by very low iron ore prices.

The major magnetite reserves in South Africa are in the Bushveld basin. There is 265 million tonnes of stockpile product that is mainly an output of other mining activity in the region.
Magnetite has no fixed trade price – spot prices are mainly dependent on quality and logistical factors. With Iron Ore prices being at a low level, it is becoming challenging for the commodity to compete accordingly. There are also some risks with regards to supply chain capacity (especially rail) and the enablement of the export process and miners capacity to produce requisite volumes once the stockpiles are depleted. The LTPF assumes that the majority of magnetite will be exported via Richards Bay but clearly the port of Maputo will continue to be a major competitor, making this commodity forecast highly speculative.

6.6 IRON AND STEEL

The South African steel industry has approximately 10,3 to 11,9 mt of steel production capacity, however, the industry has been producing well below capacity since 2012. This is primarily production cost related where South African producers are finding it difficult to compete with emerging markets.
Production of iron and steel is expected to grow at an average of 2.3% p.a. from 2016 until 2046. Imports are expected to grow at only 2.5% p.a. over the forecast period, mainly due to import substitution and local surplus capacity. The LTPF assumes that some slow production growth is possible even though it is unclear exactly where and when this will happen.
6.7 CONTAINER UNITS

Internationally, marine deep sea container growth is estimated between 5% - 6% over the next few years, which is higher than expected GDP growth. Trends in the global container vessel fleet are influencing this growth. Drewry Maritime reports that in 2014 the global fleet has reached a turning point with the number of vessels now decreasing.

Growth in containers is dependent on the commodities that are being transported for import, export and local transport purposes. Container growth is therefore dependent on almost every industry.

![Figure 24: Container Units rail forecast (millions)](image)

There appears to be significant room for rail market share growth with this commodity. Furthermore, opportunities for domestic container markets can accelerate the growth even further although that market segment may be less profitable and not established as yet.

Market growth will primarily depend upon appropriate rail terminal infrastructure in the major ports and inland hubs around Gauteng. If no terminals are available, containers will remain on increasingly congested roads and will be de-stuffed in warehouse facilities in the back of port zone.
6.8 AUTOMOTIVE UNITS

There are currently seven manufacturers of original equipment (OEMs) with assembly plants in South Africa. Industry trends show that, for an OEM to remain competitive in South Africa, it must have a successful export operation. Major export markets for South Africa manufacturers include: China, Japan, Australia and the European Union. The automotive industry in South Africa is the country’s largest manufacturing sector, with 533 120 motorcars and light commercial vehicles being produced in South Africa in 2014 (NAAMSA).

Automotive flows relative to all flows in South Africa is small (0.5% of ton kilometres), but contributes 1.1% to transport costs and 1.7% to logistics costs. A much higher percentage of these flows (84%) are on corridors (compared to 29% of all commodity flows on corridors) and nearly one third each are on Natcor and Southcor (Western Cape to Port Elizabeth).

With the inception of the Automotive Production Development Programme (APDP) which came into effect on 1 of January 2013, there are some good prospects for the industry. Under this programme, Government has set itself a vision of doubling vehicle production in South Africa by 2020 to 1.2 million vehicles p.a. The APDP will seek to shift the emphasis away from an export focus to one that emphasises value addition and scale in the production of vehicles locally, as well as the further development of world-class automotive component manufacturing.

Future production increases will continue to be driven by the need of OEM’s to specialise in one or two high volume models, obtaining economies of scale via exports and in turn importing those models not manufactured in the country to complement their domestic model mixes.