

The background of the entire page is a dark blue-grey color with a subtle pattern of diagonal lines. Scattered across this background are numerous question marks of various colors, including orange, pink, teal, blue, green, yellow, and grey. Some question marks are larger and more prominent, while others are smaller and partially obscured, creating a sense of depth and inquiry.

LOGISTICS
BAROMETER **2016** South Africa

Who?

PROFILE OF DEPARTMENT OF LOGISTICS, STELLENBOSCH UNIVERSITY

The Department of Logistics was founded in 1960. It is the oldest tertiary academic department in South Africa to offer education and training in Transportation and Logistics. The Department is home to the Logistics Management, Quantitative Management, Operations Research and Transport Economics focus areas.

These focus areas can be elected in any of the Faculty of Economic and Management Sciences' four undergraduate programs. Operations Research can also be elected as a stream of the B.Sc. (Mathematical Sciences) degree.

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The latest edition of the Logistics Barometer and its accompanying figures can be downloaded at www.sun.ac.za/logisticsbarometer

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Why?

The **second** edition of the South African Logistics Barometer continues the macrologistics research work published in the CSIR State of Logistics Survey™ for South Africa (discontinued in 2014) **and the first Logistics Barometer published in 2015**. It fits into a growing global body of work to measure national level logistics costs and links to the World Bank Trade Facilitation and Logistics Global Knowledge Network.

The Logistics Barometer provides a **numerical** analysis of logistics costs trends in South Africa supported by insights from logistics industry specialists and academia. The usefulness of calculating annual data lies in the fact that **trends** can be identified and applied by both operational and strategic analysts in the public and private sector for future planning, policy development and investment objectives on a macroeconomic level. The calculations in this edition are up to 2014, with an estimate for the 2015 year (2015e), and a forecast for the 2016 year (2016f).

At 11.2% in 2014, South Africa's logistics costs as percentage of GDP deteriorated slightly compared to 2013, and this trend is expected to continue (refer Figure 1). The ratio generally improved up to 2011, but has been on an upward trend since then (refer Figure 2).

South Africa is still **one of only three** countries who consistently measures and publishes logistics costs on a national level, the other two being the U.S.A. and Finland.

The Logistics Barometer has, as its backbone, more than **20** years of research into freight volumes and freight flows in South Africa. The logistics cost calculations have been refined over the past **13** years to make it one of the most robust and reliable quantitative reports on logistics costs **globally**.

The source data for the logistics cost measurements originate from the Transnet Freight Demand Model (FDM), GAIN Group's National Freight Flow Model (NFFM), StatsSA's Annual Financial Statistics Survey (AFS) and StatsSA's Quarterly employment statistics (QES).

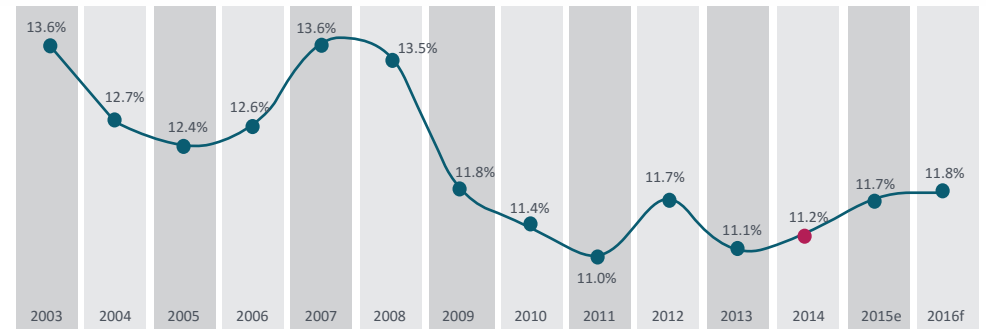


Figure 2: Long-term view of South Africa's logistics costs as percentage of GDP

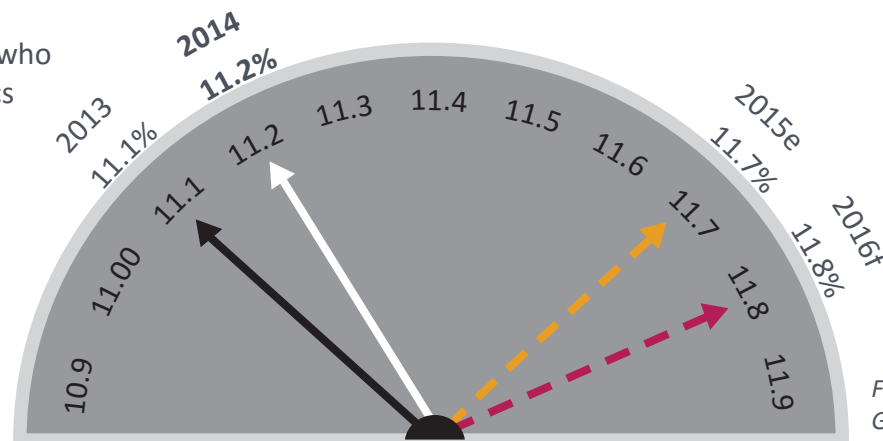


Figure 1: South Africa's logistics costs as percentage of GDP is rising

Where?

South Africa's gross domestic product (GDP) totalled R4 014 billion in 2015¹ and although it has claimed back the title of **Africa's biggest economy** from Nigeria due to exchange rate fluctuations, both economies look to be on the brink of recession mostly due to the decline in export commodity prices.

Average GDP growth for South Africa equalled 2.1% between 2011 and 2015, but the International Monetary Fund (IMF) adjusted the growth forecast for 2016 to only 0.1%, recovering to 1.0% in 2017. Nigeria's economy is forecasted to retract by -1.8% in 2016, recovering to 1.1% in 2017². Both countries **are well below** the forecasted world output growth of 3.1% in 2016 and 3.4% in 2017² (refer Figure 3).

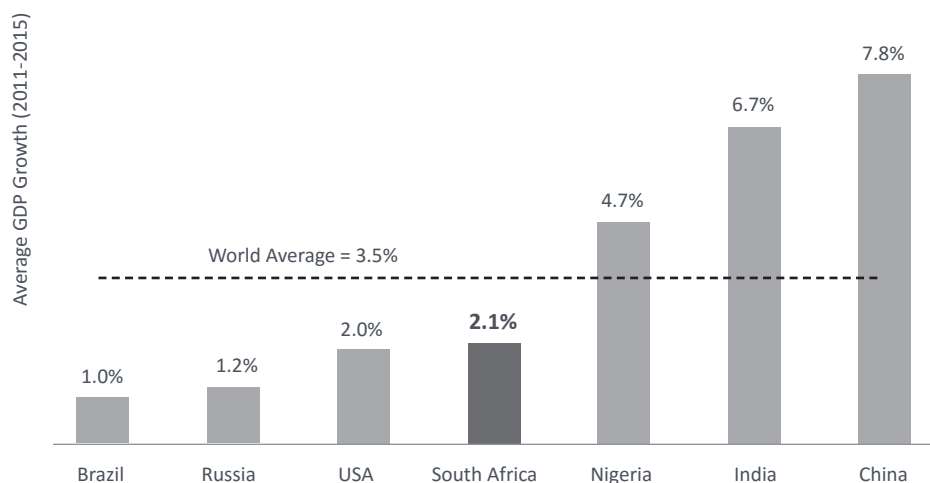


Figure 3: Average GDP growth (2011-2015)

The Logistics Performance Index (LPI) provides a comprehensive measure of the efficiency of international supply chains³. South Africa was ranked 20th out of 160 countries in 2016 and is classified as a **logistics over-performer** when compared to its peers. When looking at the performance over the aggregated LPI (2010-2016) (refer Figure 4), South Africa is only one of two countries in the top 30 that are not classified as high-income countries, the other being Malaysia.

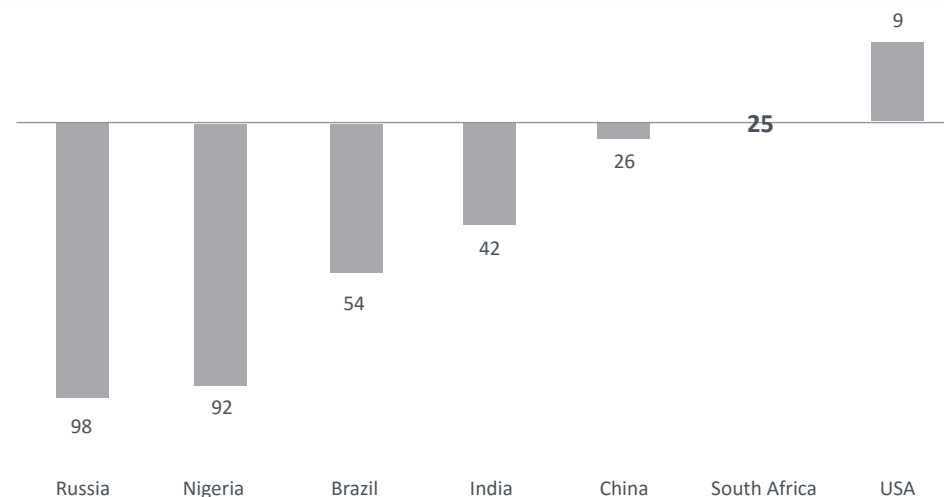


Figure 4: LPI rank (over four editions 2010, 2012, 2014, 2016)³

1 StatsSA, 2016. Statistical release P0441: Gross domestic product, first quarter 2016. Pretoria, South Africa.

2 IMF, 2016. World Economic Outlook Update, July 2016. Washington, DC. USA.

3 World Bank, 2016. Connecting to Compete 2016. Washington, DC. USA.

<http://lpi.worldbank.org/>

When?

South Africa's logistics costs totalled **R429 billion** in 2014 and equated to **11.2%** of GDP or **51.5%** of transportable GDP (refer Figure 5). Logistics costs increased by 9.2% between 2013 and 2014, after showing modest growth of only 3.5% in the previous period. It is estimated to have grown by 9.5% during 2015 and is forecasted to grow by 6.3% in 2016, in line with current inflation estimates.

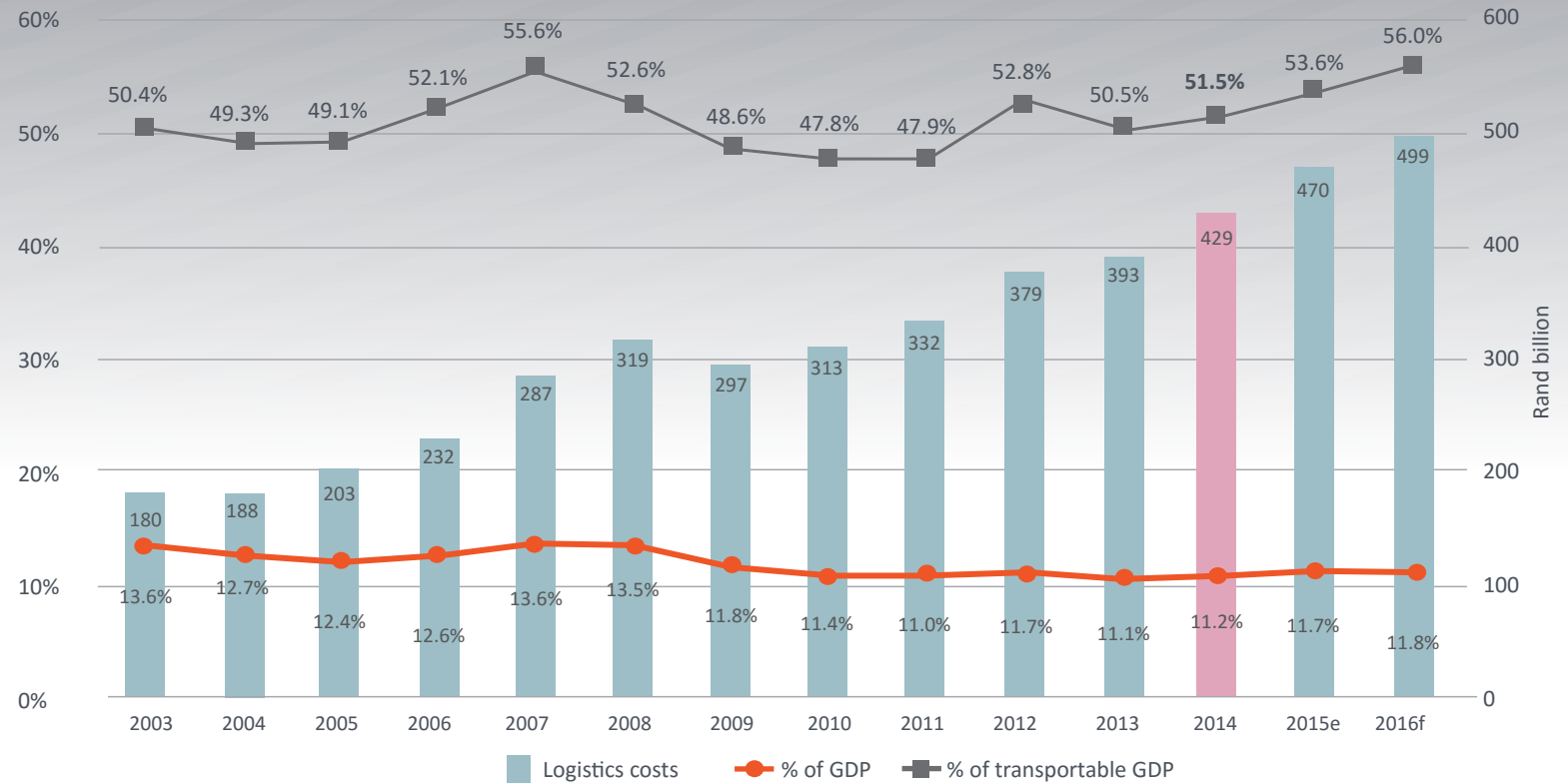


Figure 5: South Africa's logistics costs trend

The phenomenon from 2012 to 2013 of logistics costs rising faster than the underlying transport activity (measured in tonne-km) was reversed in 2014 with a relatively larger growth in tonne-km than real costs (refer Figure 6). The growth of low-value transport relative to other categories could have contributed to this phenomenon.

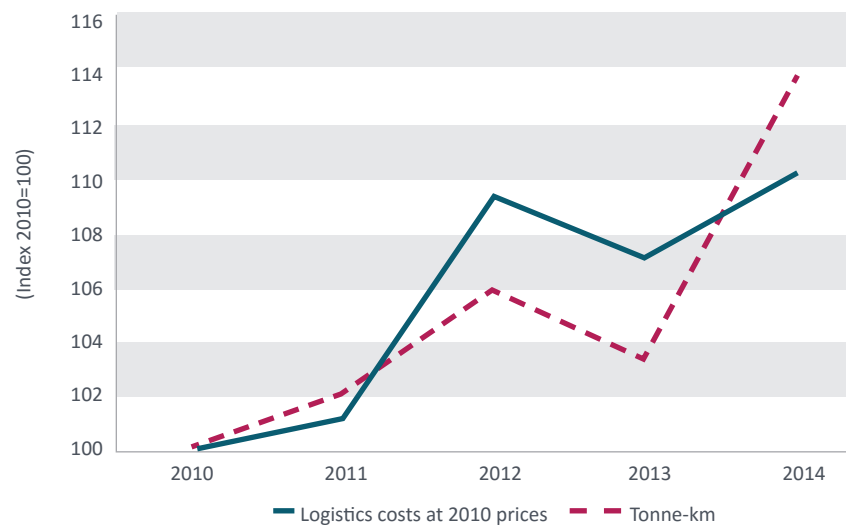


Figure 6: Logistics costs in real 2010 terms

How does South Africa compare to other countries?

Over the past number of years more countries have attempted to measure logistics costs, some only as a once-off exercise. It is worthwhile therefore to provide a comparison between these countries although various ways of measuring exist and different economic and structural factors influence logistics costs (refer Figure 7).

Developed countries would have lower logistics costs when expressed as a percentage of GDP, the outlier being Finland, which has a low-outsourcing environment and a long cash-to-cash cycle. The developing countries also each face their own challenges. India is densely populated with high congestion and inadequate infrastructure, infrastructure also being the biggest challenge for efficient logistics in all the BRICS countries. Russia has long transport distances to contend with, Brazil has port operational challenges and China has one of the highest regulated logistics industries in the world.

South Africa's infrastructure challenges in a BRICS context are therefore not unique and performance on LPI measurements not poor. But the country is far away from trading partners, has long inland transport distances, relies heavily on unbeneficiated exports, and has a much smaller economy than the other BRICS countries, which is also growing slower than most. The country is therefore vulnerable to external shocks and logistics cost reduction needs to be a priority.

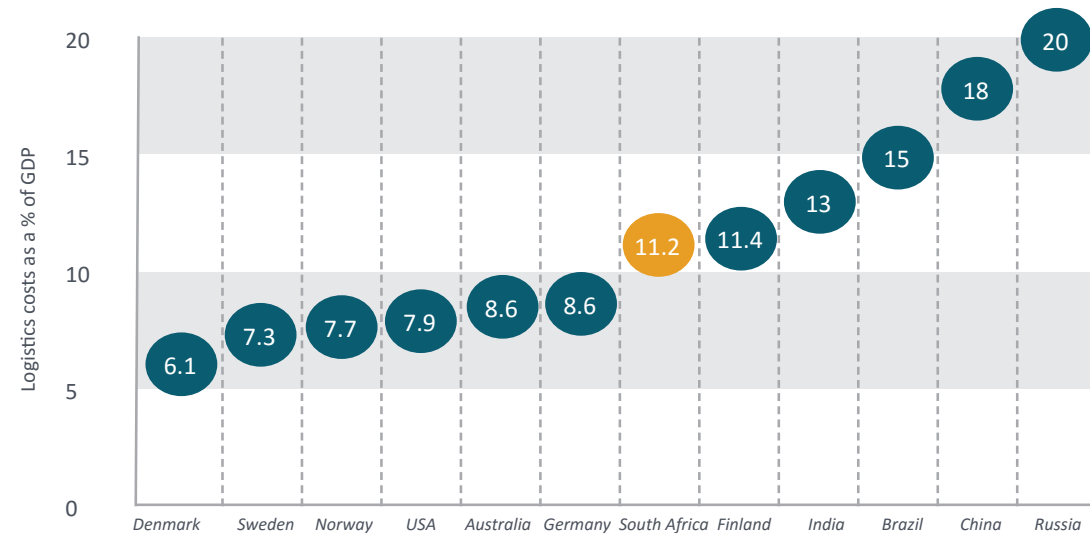


Figure 7: Comparing logistics costs for selected countries

Trade supply chains

The 13 years of measuring South Africa's logistics costs included measurements of international trade logistics costs within South Africa, i.e. up to the quay wall landside for exports and from the quay wall landside for imports. Port costs and ocean carrier costs to foreign ports were excluded and it was therefore always a domestic cost measurement. The work was recently expanded to include these aspects.

The impact of international trade logistics costs (ITLC) on national logistics costs is depicted in Figure 8⁶. The country's total ITLC (up to and from foreign port gates) is R242 billion or 11.7% of trade GDP (i.e. the value of all traded commodities, amounting to R2 061 billion). Only 9.5% (R23.1bn) of these ITLC are paid directly to ports (port authority and port terminal charges).

This means that direct port costs are only 1.1% of the value of trade⁷. As a direct result of South Africa's spatial challenges, the highest portion of these costs is the inland logistics, being 41.8% (R101.1bn). That is because our centres of production and consumption are far from ports. Given South Africa's distance from global markets, the contribution of ocean carrier costs is also significant, at 39.2% (R94.9bn).

⁶ Havenga, J., et al., *International trade logistics costs in South Africa: Informing the port reform agenda*, *Research in Transportation Business & Management* (2016), <http://dx.doi.org/10.1016/j.rtbm.2016.08.006>

⁷ For the purposes of this evaluation maritime transport was included because it is believed that, on a nation state level, policy and infrastructure could affect this cost component. But even with this removed, ITLC equal 7.1% of trade GDP, of which 15.7% is paid to the port, while port charges equal 1.1% of the total value of trade.

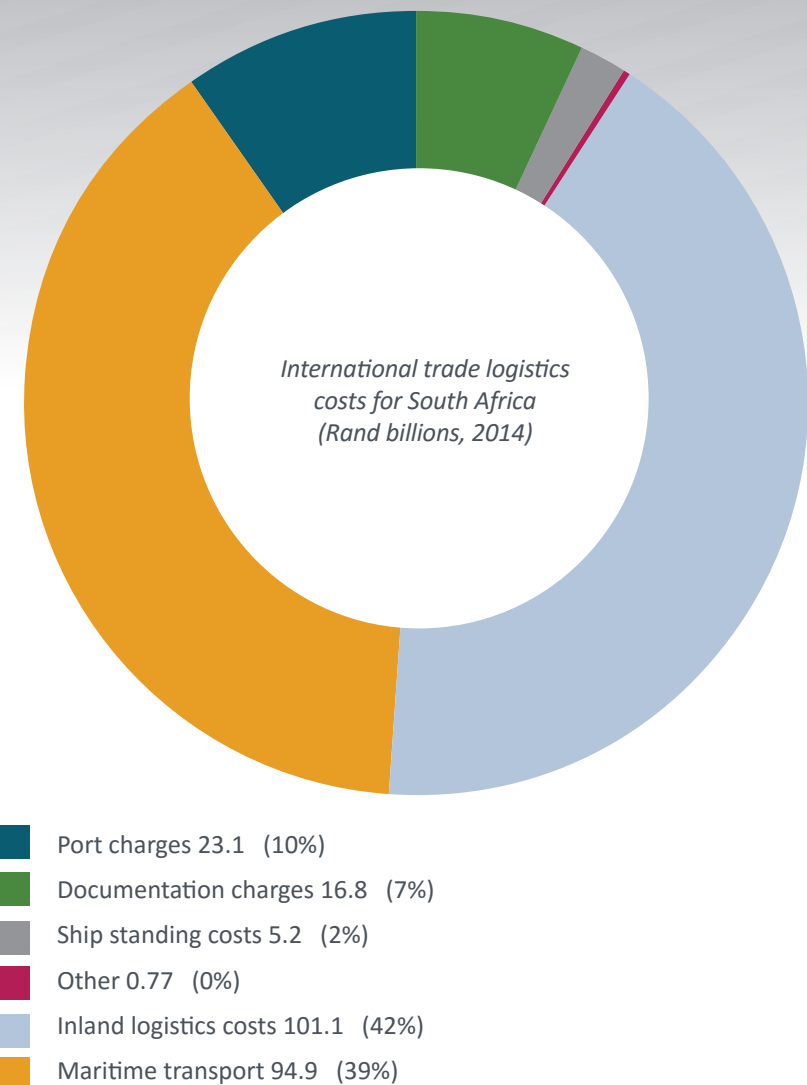


Figure 8: International trade logistics costs for South Africa (Rand billions, 2014)

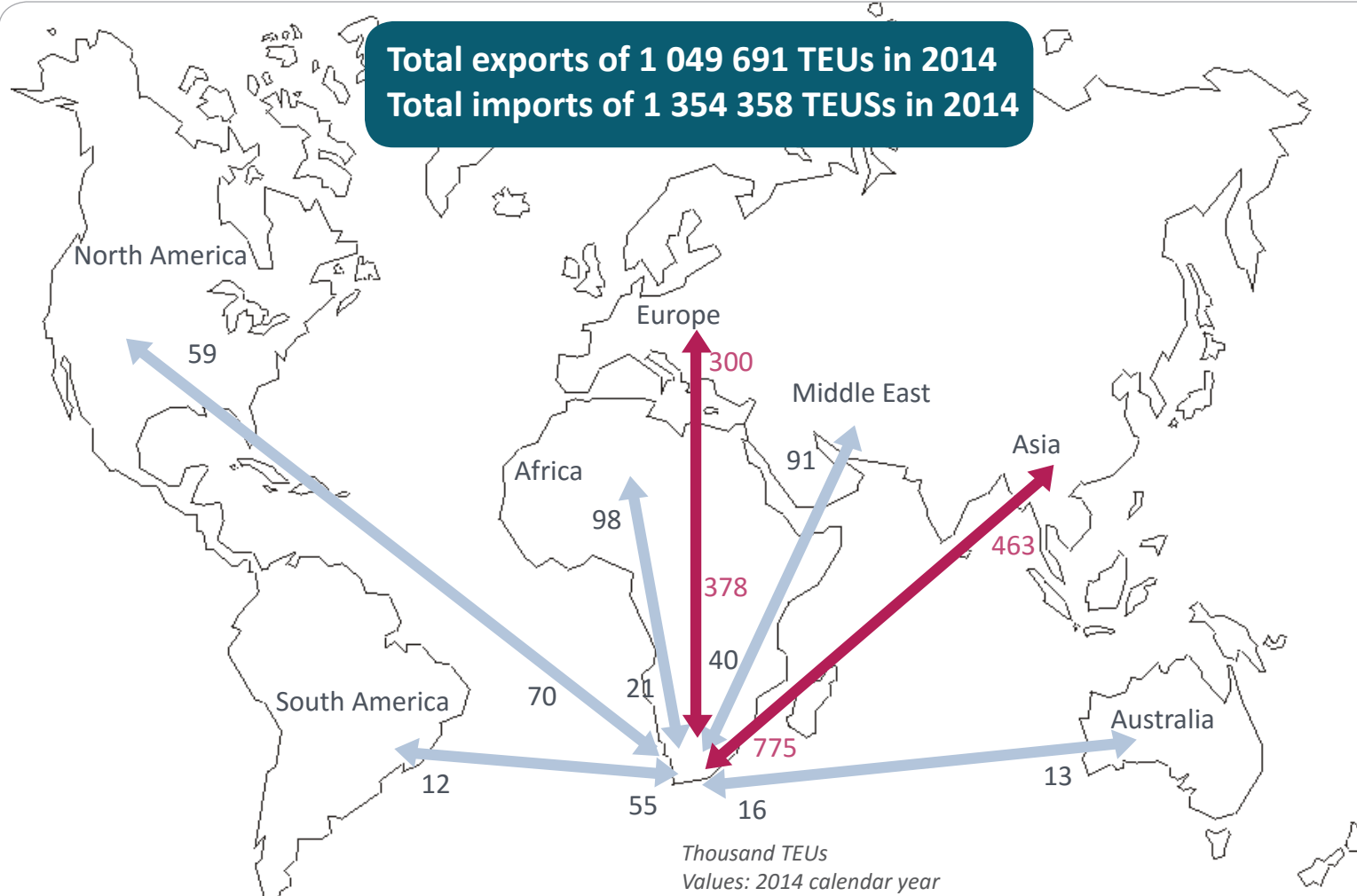


Figure 9: Trade flows of South African containers in 2014

While 89% of South Africa's imports and exports is via bulk (liquid, break and dry bulk), 2.4 million TEUs (containerised freight) were handled in 2014. These containers are mostly for the trade route to Asia, followed by the trade route to Europe. A diagram showing the major container trade routes for South Africa is given in Figure 9.

**2.4m
TEU**

The costs, up to the point when ships leave port gates or arrive in front of port gates, amount to close to R46bn (port charges, documentation charges and ship standing costs) ('Other' is composed of truck standing costs and inventory carrying costs, which is negligible). About half (50.3%, R23.1bn) of these costs are paid to the port authority and terminal operators. The rest is additional costs caused by documentation and additional transport costs due to the delay of ships in front of and in the port. Of the R22.8 billion (R16.8bn + R0.77bn + R5.2bn) remaining additional costs, around three quarters (73.7%) are documentation charges.

Only 3% is because trucks are delayed before and in the port and just under a quarter (22.8%) because ships are delayed in front of and in the port. A very small cost is also incurred for the financing of delayed inventory (ICC). Significantly though, these other port-related charges are more or less equal to the direct port charges. More significant is the fact that most of these charges are documentation charges or relates to what the World Bank perceives as the ease of doing business. (Please note that in this research, delay also includes "normal" turnaround time (i.e. it is impossible to turn trucks and ships around in no time), but it can always be improved. The data indicates the baseline number from which it can be improved.)

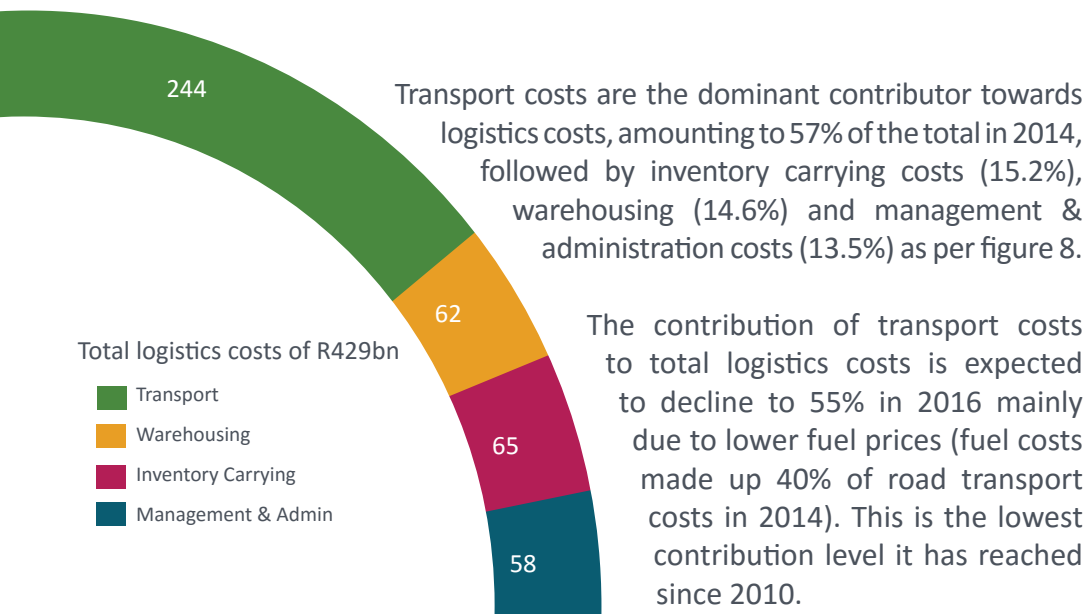


Figure 10: 2014 Logistics cost elements (Rand billions)

Transport costs showed a moderate increase of 3.7% between 2013 and 2014 (refer Figure 11), still driven by efficiency gains from logistics service providers.

The trade-off was that inventory carrying costs increased by 21.8% between 2013 and 2014. The increase in the prime interest rate from 9.0% at the start of 2014 to 9.25% at year-end, compared to 8.5% in 2013, contributed to the higher inventory carrying costs, but external factors such as economic uncertainty and a volatile currency have led to increased inventory levels and are forecasted to have the same effect in 2016.

On the back of these higher inventory levels, warehousing costs (which include storage and handling costs) increased by 12.1% between 2013 and 2014, following on nominal growth the previous two years, and is estimated to have grown above inflation in 2015.

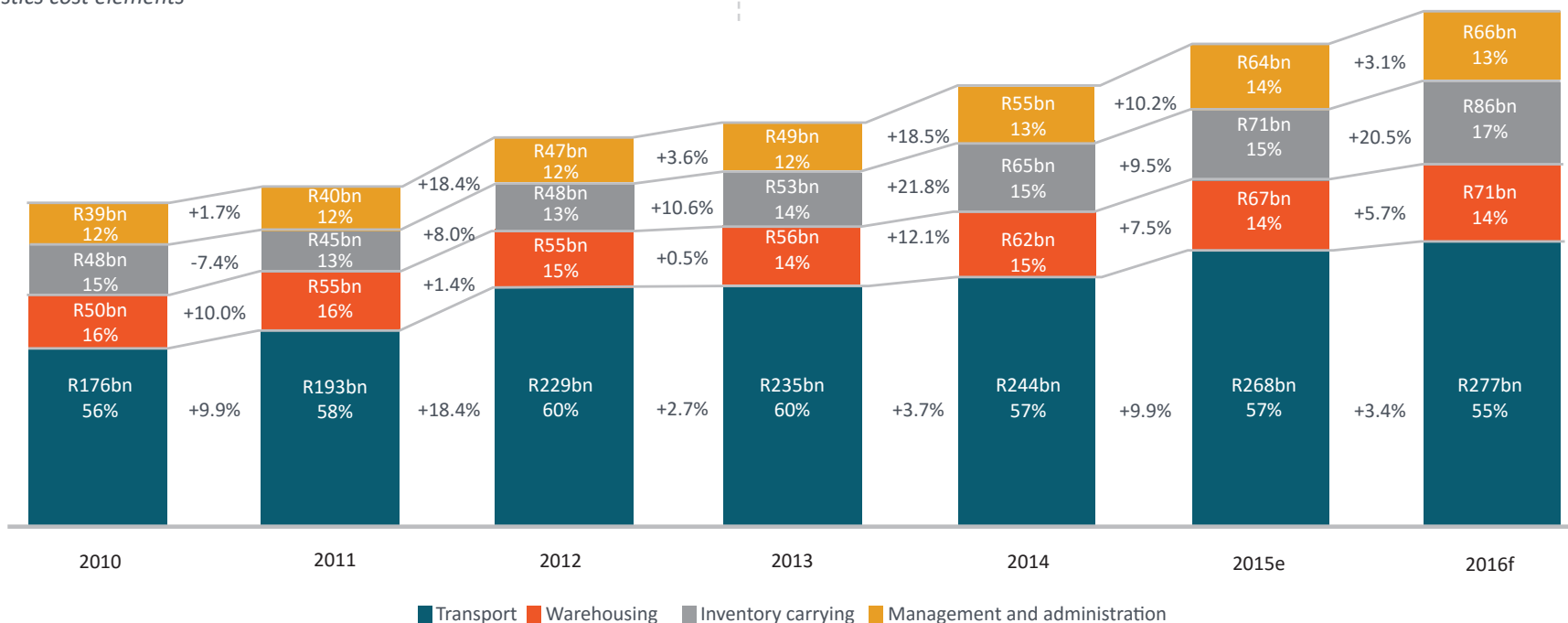


Figure 11: Trends in South Africa's logistics costs stack elements

Road transport contributed 83% to transport costs in 2014, rail tariffs contributed 15% and pipeline tariffs contributed 2%.

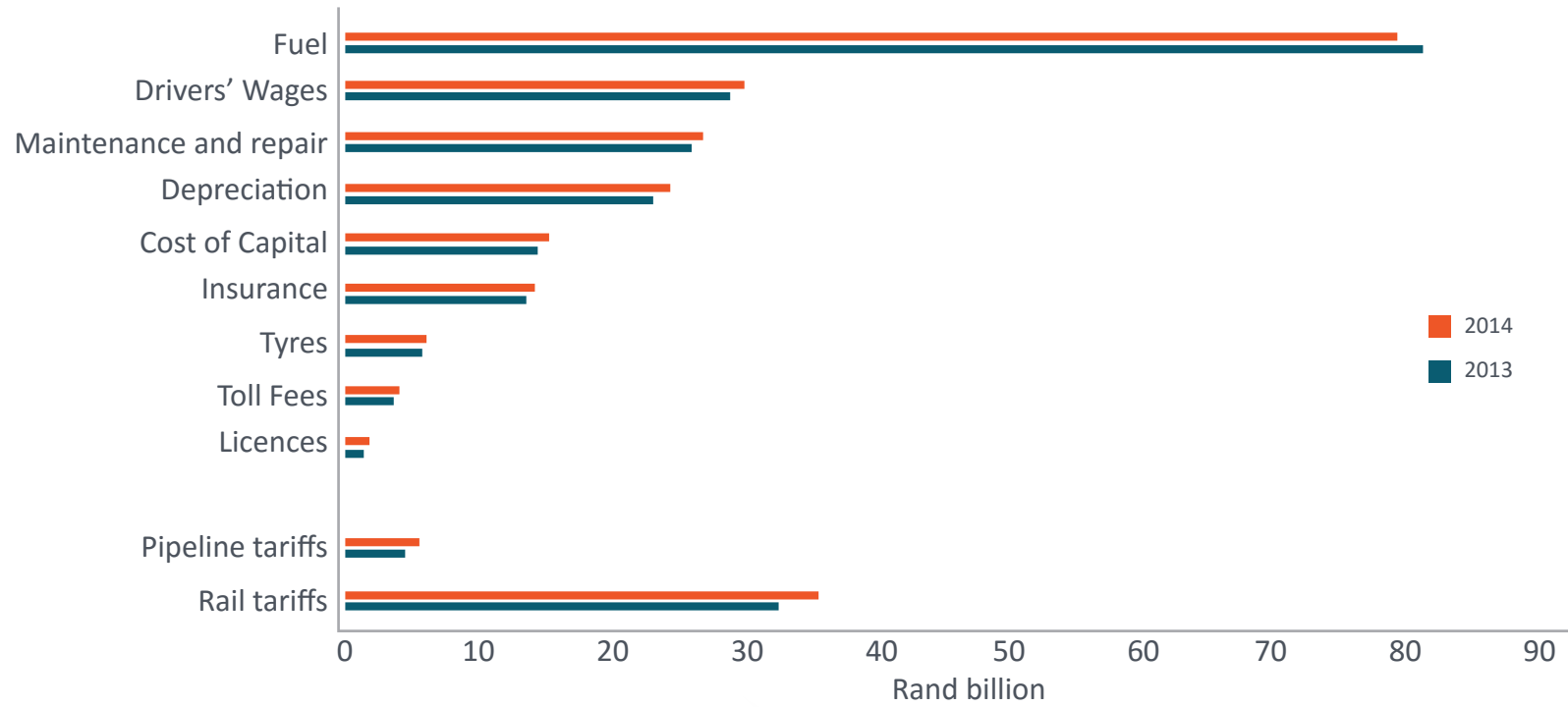


Figure 12: Cost contribution per transport mode (2014)



What?

Demand for land freight transport reached **848 million tonnes** in 2014, an increase of **8.4%** from 2013. It is estimated that freight volumes increased to 865m tonnes in 2015 and is set to decrease to 856m tonnes by the end of 2016, mainly due to lower bulk mining exports.

The primary economy (agriculture and mining) was responsible for 76% of total volume but only contributed 44% to the transportable GDP. In contrast, the secondary (manufacturing) sector made up the remaining 24% of volume, but added 56% value to the transportable economy (refer Figure 13). Maps of the freight volume movements for agriculture, mining and manufacturing are shown in Figure 14 to Figure 16. Agricultural freight volumes are low compared to the other sectors (in line with its GDP contribution); mining dominates, consisting mostly of the dedicated export lines of coal (through Richards Bay) and iron ore (through Saldanha).

Manufactured commodities are highly densified along the country's two key general freight corridors, namely Gauteng-Cape Town and Gauteng-Durban.

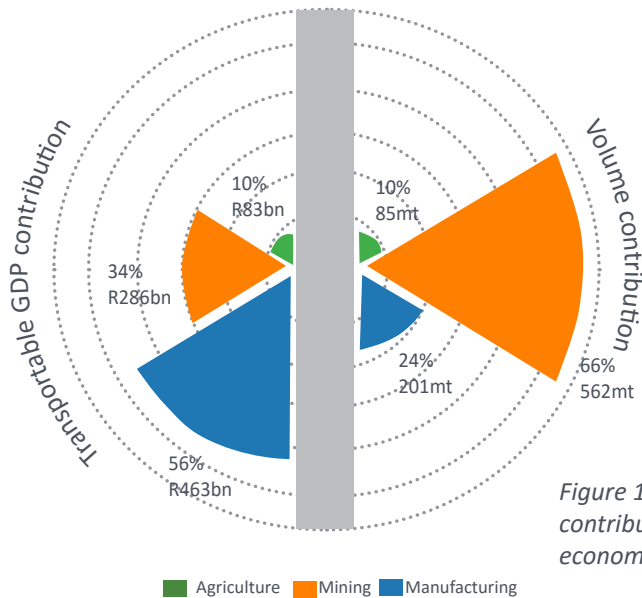


Figure 13: Value and volume contribution to the transportable economy in 2014

Figure 14: Agricultural freight flow volume for 2014

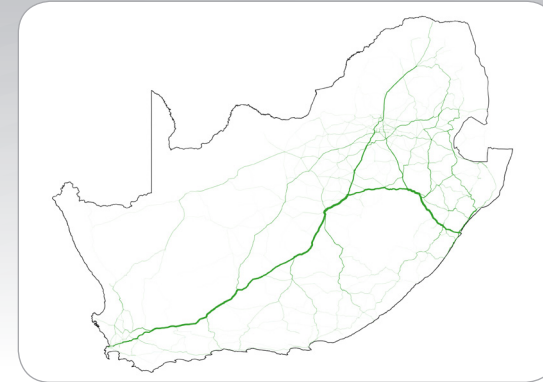


Figure 15: Mining freight flow volume for 2014

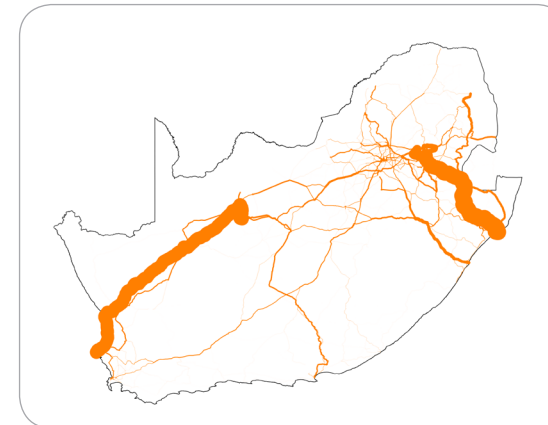
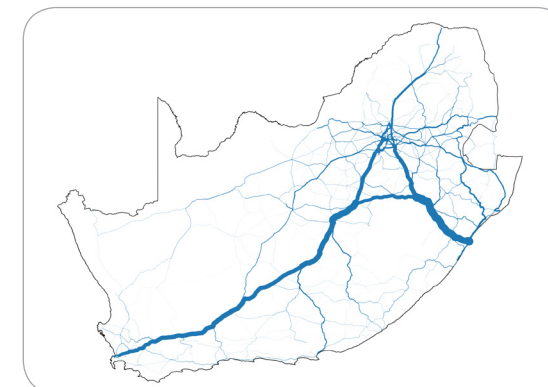


Figure 16: Manufacturing freight flow volume for 2014



The 848 million tons land freight flows in 2014 translated into **379 billion tonne-km**, an increase of **4.9%** from 2013 (refer Figure 17).

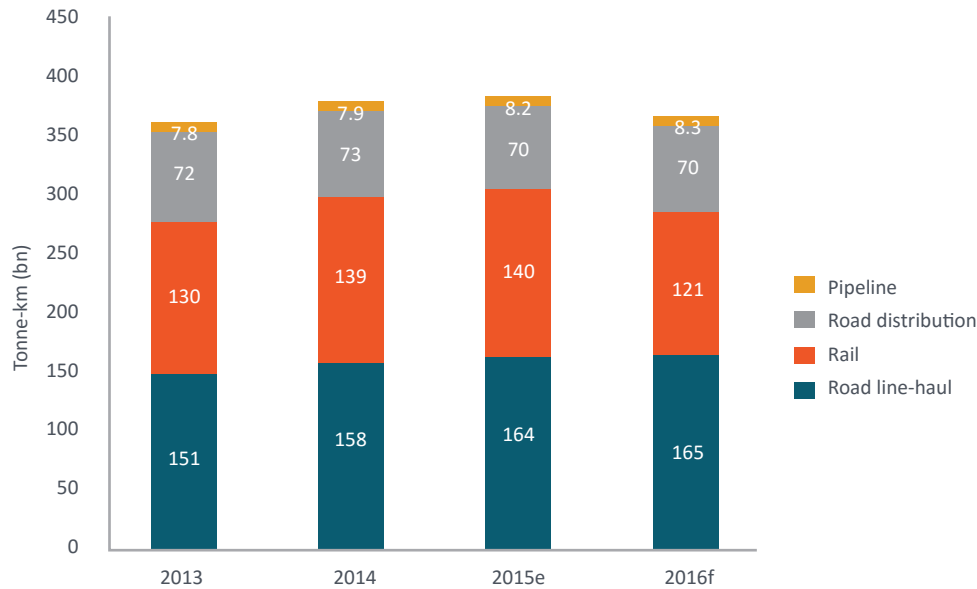


Figure 17: Tonne-km per mode (South Africa 2014)

If the dedicated ring-fenced transport systems (i.e. the rail export lines, pipelines and conveyer belts) that totalled **107.5 billion tonne-km** in 2014 are removed, **272 billion tonne-km remain** that is classified as general freight. Road freight comprises 85% and rail freight 15% of this total. The general freight system can be further classified into three typologies, corridor, metropolitan and rural transport, as delineated in Figure 18.

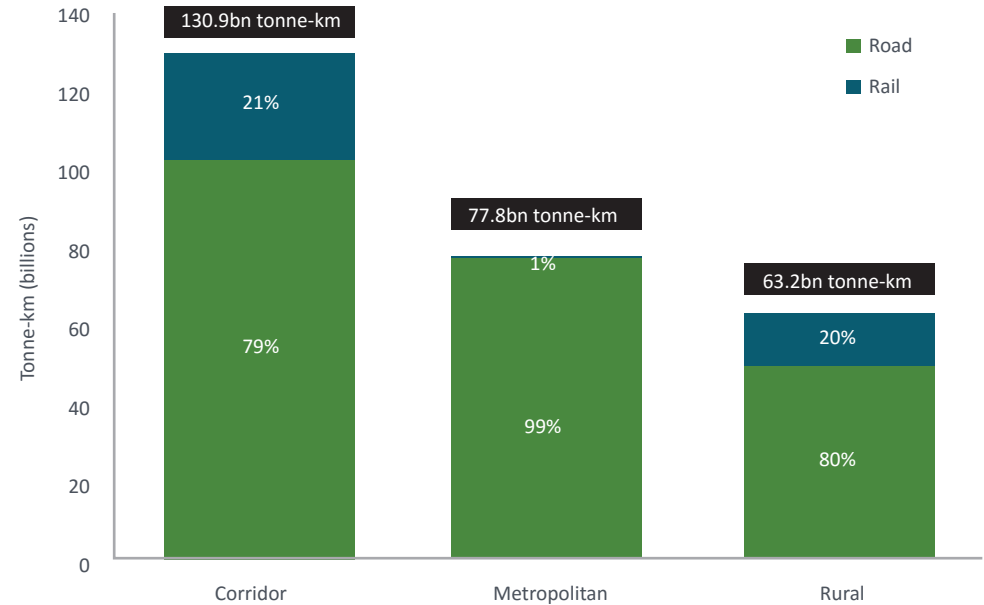


Figure 18: Typological division of general freight transport (South Africa 2014)

Rail increased the export of primary commodities primarily, as this is its natural market, but a small portion in 2014 was still transported by road. It is expected that, with the increase of rail capacity and a slump in commodity prices, the transport of primary commodities on road should decrease markedly. Rail has also been able to increase corridor market share marginally in 2014.

How?

What drives South Africa's good performance in the logistics and supply chain arena as measured by the LPI, leading to a better cost position than BRICS peers?

To function well in supply chain management, as in any other industry, necessary and suitable skills ("soft" infrastructure) are required. Theoretical skills can be obtained through **appropriate education**, although funding is often a challenge, while experience and practice cultivate these skills to contribute to the triple bottom-line in a complex and multidimensional value chain environment⁸.

In the past, South African supply chain managers and executives have had the required experience and know-how that enabled the industry to perform well in the global arena. Knowledge and understanding of key operational elements and the ability to adapt to an ever-changing environment has been a key strength of successful logistics and supply chain companies in South Africa for decades.

The looming threat is that the future South African supply chain generation is at risk of losing this advantage due to sub-standard basic education, underperforming higher education, and lack of practical knowledge- and skills transfer in the work environment.

Although there are some very commendable initiatives from major logistics service providers in South Africa relating to training and skills development, a renewed focus on and drive within these areas are necessary to support the sustainability of the industry, and to facilitate continued human resources growth, development and skills transfer.

This will contribute to South Africa's competitiveness and performance in the global supply chain, with the added benefit of fuelling economic growth and social development in the country.

On the hard infrastructure side, South Africa faces challenges, but so do other countries. The country's position is however deemed to be more vulnerable to external shocks and cost impacts, due to its size and distance from markets.

As far as cost reductions in general are concerned, on the demand-side we need to **beneficiate more**. This is a central planning fundamental for job creation and growth, but also for logistics costs as beneficiation reduces logistics costs relative to GDP. We should also, as a country, spend less on imported goods, with the same effect. On the supply-side, the modal shift requirement is now more important than ever, supported by more efficient logistics, trucks and driving, i.e. a wider adoption of RTMS.

⁸ Hunter, D. 2015. Supply chain orchestration – people are needed to play the music <http://www.logisticsnews.co.za/Article.aspx?ID=133>. [Accessed: September 2016]

