



# Modal Split and South African Freight Trends

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# Modal Split and South African Freight Trends

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- The current freight landscape
- Modal split
- Update on rail strategy
- New rail initiatives
- The future of rail

# South Africa has many logistics challenges

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- **On the demand side**

- One of the most spatially challenged countries in the world
  - Tonne-kilometre demand 3 times global average
- No demand management – such as for electricity
  - Unnecessary delivery speed, smaller consignments, too much choice

- **On the supply side**

- Poor modal choice – 3 of 12 billion road freight kilometres should shift
- Freight logistics challenges (waiting times, empty haul, slot misses, low loads) – 3.6 billion road freight kilometres are wasted
- Operational losses (drive trains, driving behaviour, enforcement gaps)
  - 10% of emission “overspend”

South Africa were the best in class for BRICS on the LPI for a decade, but (1) is the only BRICS country with falling performance and (2) was overtaken by China in last measurement.

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# Rail market share is a difficult concept

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- The level of insourcing is high
- Segmentation is difficult and very few people understand it
- Data is scarce and more or less never collected, given the above mentioned fundamentals
- Important players seek “easy” to quote answer in order to create the illusion of managing the environment
  - Resultant answers are mostly gibberish
  - Resultant answers create even more confusion

It is important for regulatory and operators to understand the issues and constructs, and then to agree on a measurement.

# SUPPLY



Import



Production

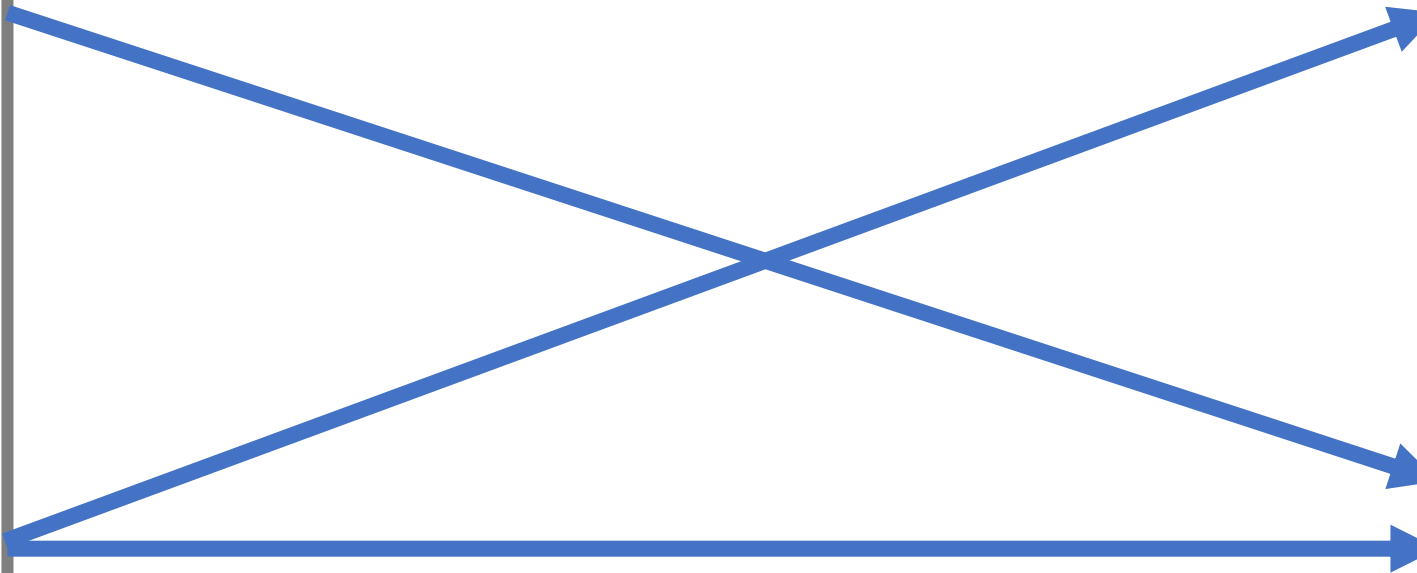
# DEMAND



Export



Consumption



Rail market share:  
25% (same in 2011)

South Africa's total volume supply / demand in 2019 = 838 million tonnes

# SUPPLY



Import



Production

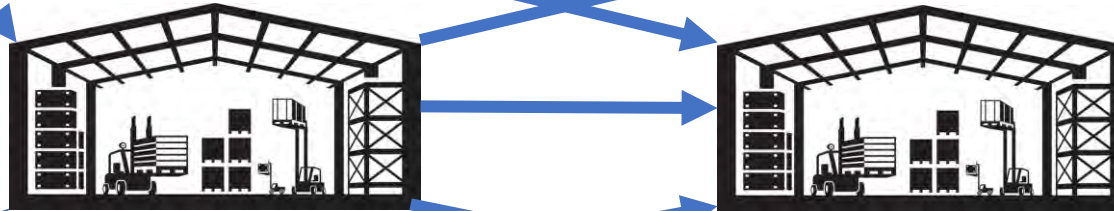
# DEMAND



Export



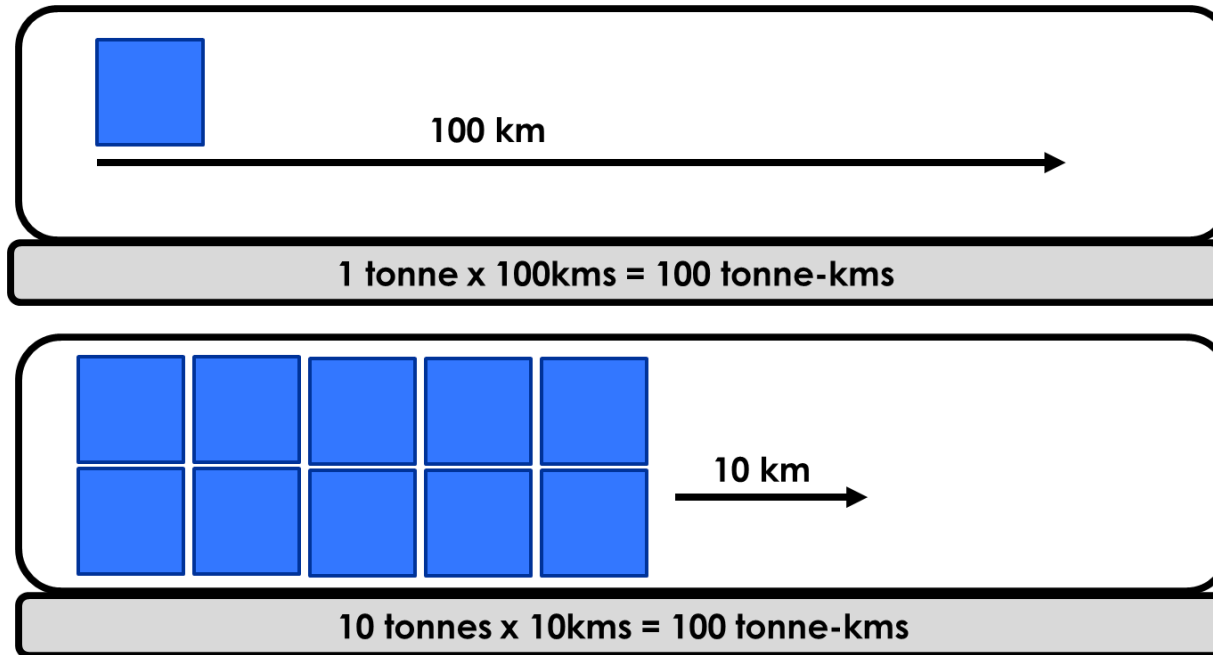
Consumption



**Rail market share:  
16% (23% in 2011)**

South Africa's total volumes shipped in 2019 = 1 587 million tonnes

# Tonne-kms is the best transport unit measure

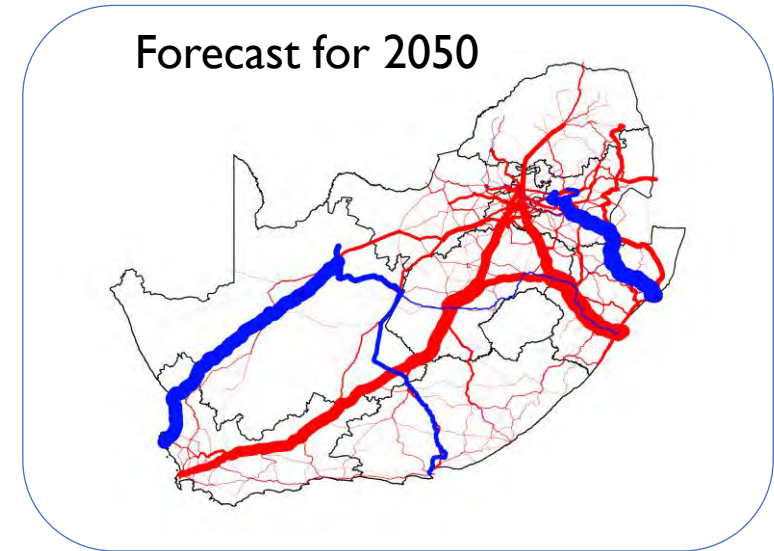
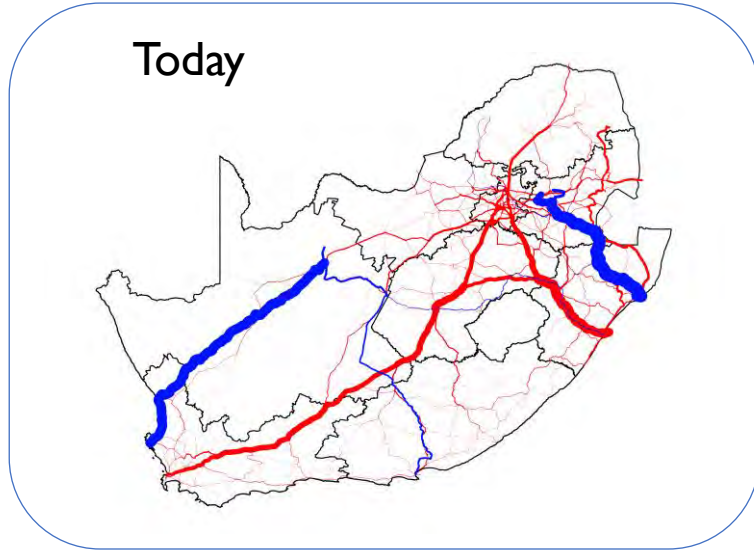


Rail market share:  
**37% (35% in 2011)**

South Africa's total tonne-kms in 2019 = 384 billion tonne-kms



# Some freight is rail “captured” – these are in fact nonsensical to include in rail market share measures



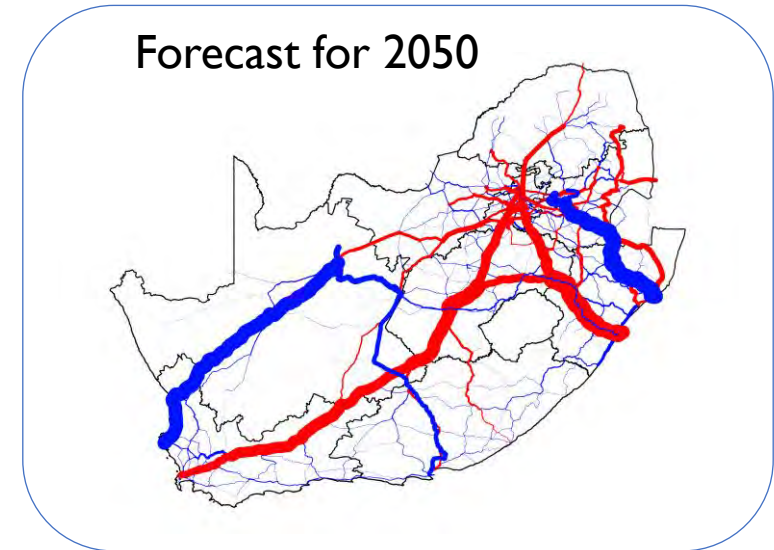
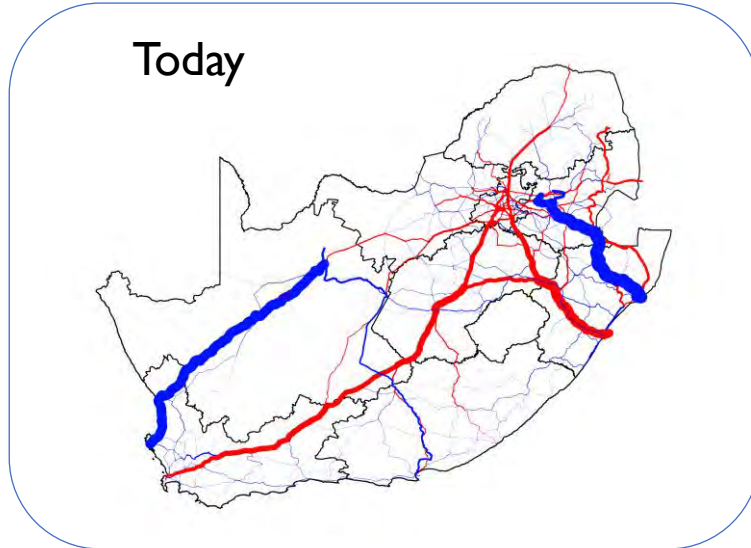
Rail market share (excluding export lines):  
**14% (18% in 2011)**

\*Note growth expectation  
for export lines vs the rest

Rail export lines in **BLUE** (Export lines – coal, iron ore and manganese)

South Africa's total tonne-kms excl. export lines in 2019 = 193 billion tonne-kms

In fact one could also argue that short distance non-corridor freight is impossible for rail and only corridors should be measured

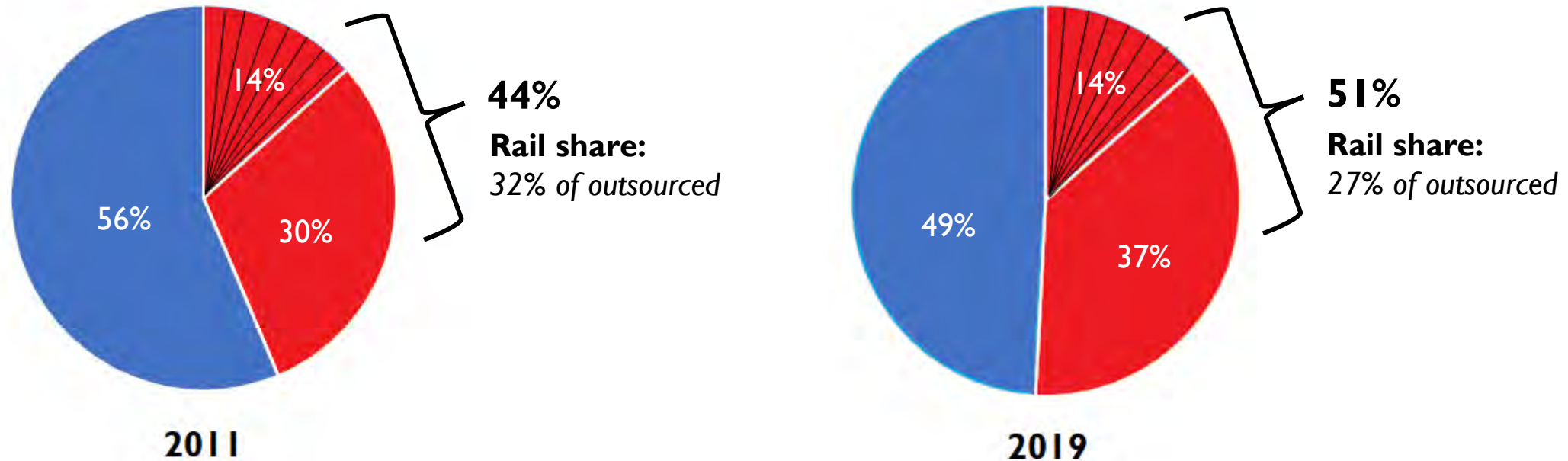


Rail market share (corridors only)  
6% (12% in 2011)

Rail export lines and non-corridors in **BLUE**

South Africa's total corridor tonne-kms 2019 = 111 billion tonne-kms (57% of total excl. mining)

# Only half of freight is outsourced: A cost view



**Insourced Transport\***

Not recorded by Statistics South Africa as transport but included in the mining, agricultural and manufacturing sectors.



**Outsourced Transport**

Recorded by Statistics South Africa and included in the transport sector.



**Rail share (Outsourced Transport)**

\*Recorded in **Freight Demand Model™**

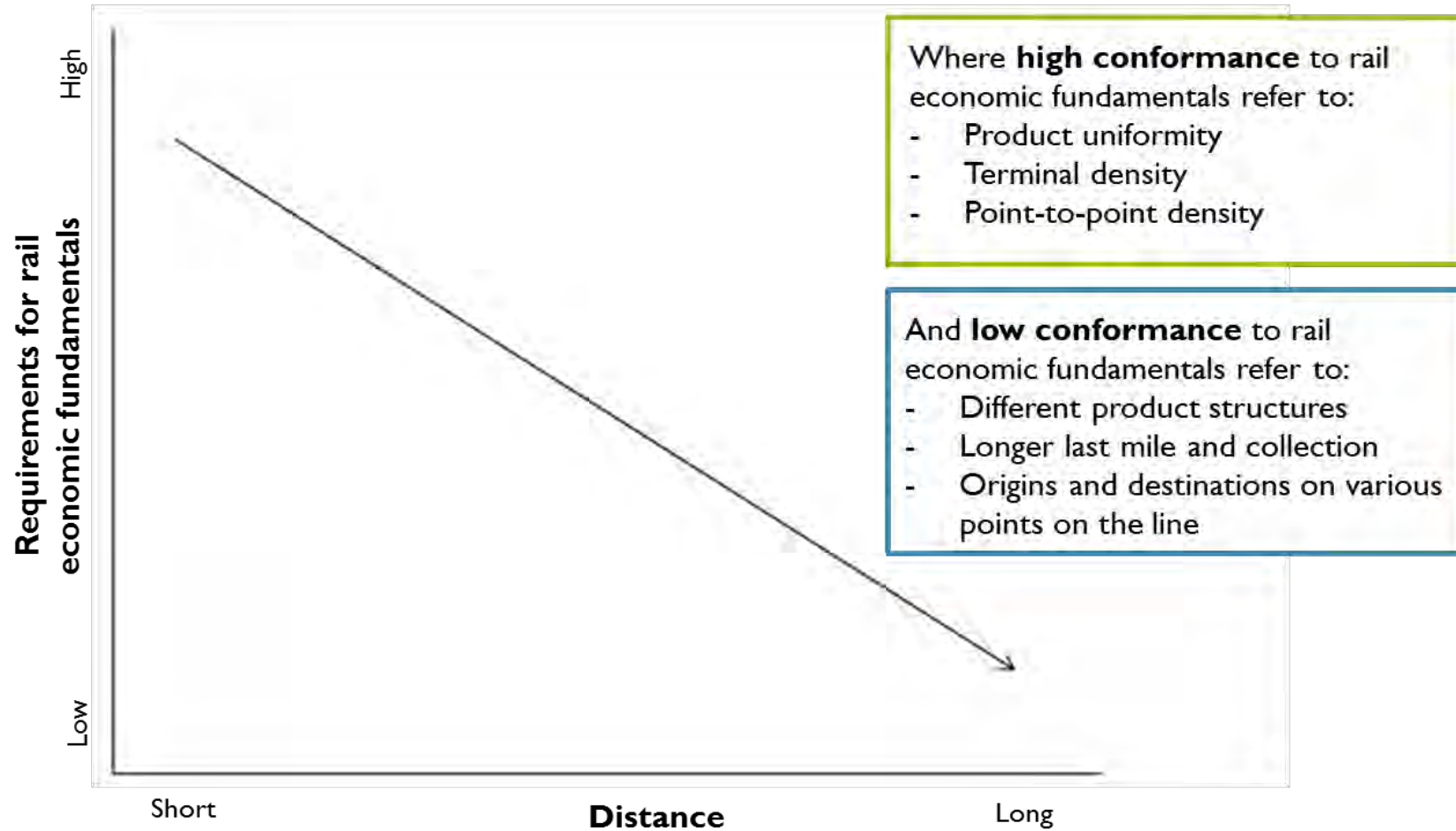
Market share based on outsourced transport can easily change by the market choosing to outsource current in-house transport: The market size is highly fluid

# We use a much more refined approach

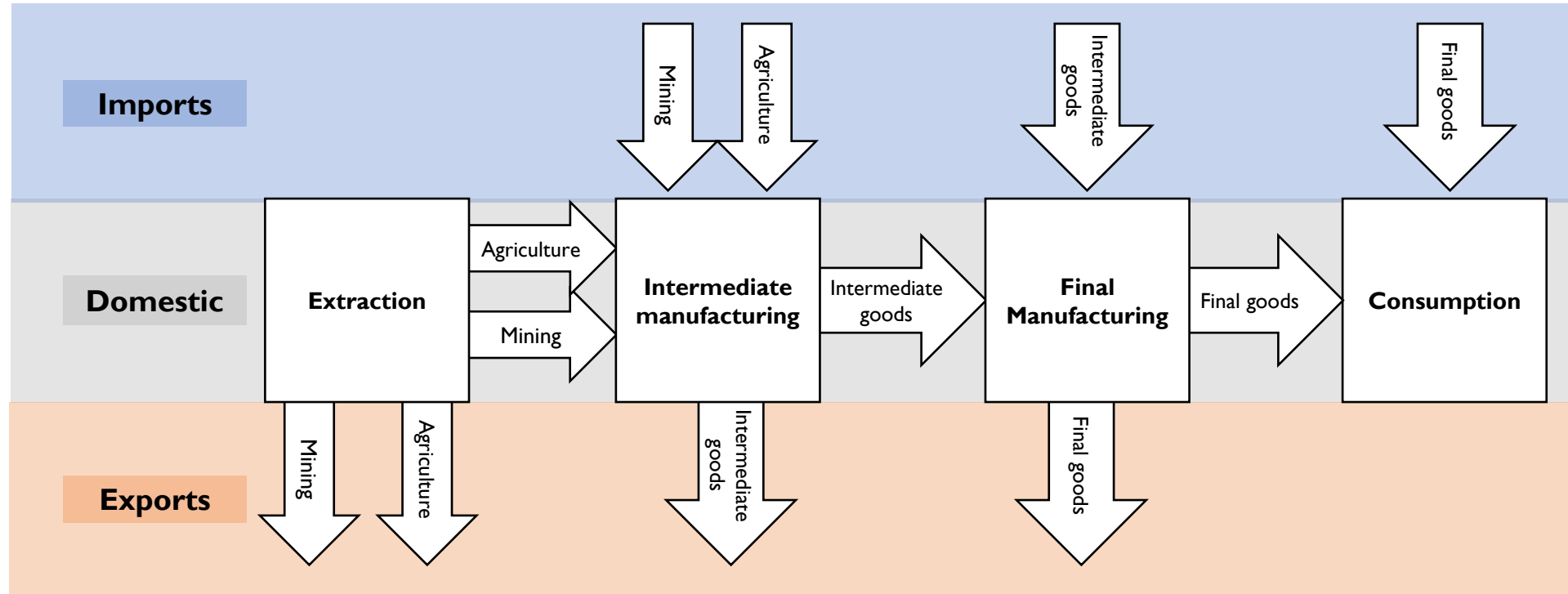
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- It firstly requires segmentation
- The rail market share should be calculated based on servicing ***rail-friendly freight***
- Rail-friendly freight is determined by:
  - Density of terminals
  - Density of lines
  - Uniformity of commodity/product
  - Distance (if all the above are met, rail can also provide services over shorter distances)
- Value trade-offs are between the cost of time vs. the lifecycle cost of transport – it is not true that rail is not suitable for any high value freight

# There is a trade off between distance and other rail economic fundamentals



# Freight-flow segmentation is informed by the basic supply chain structure of an economy

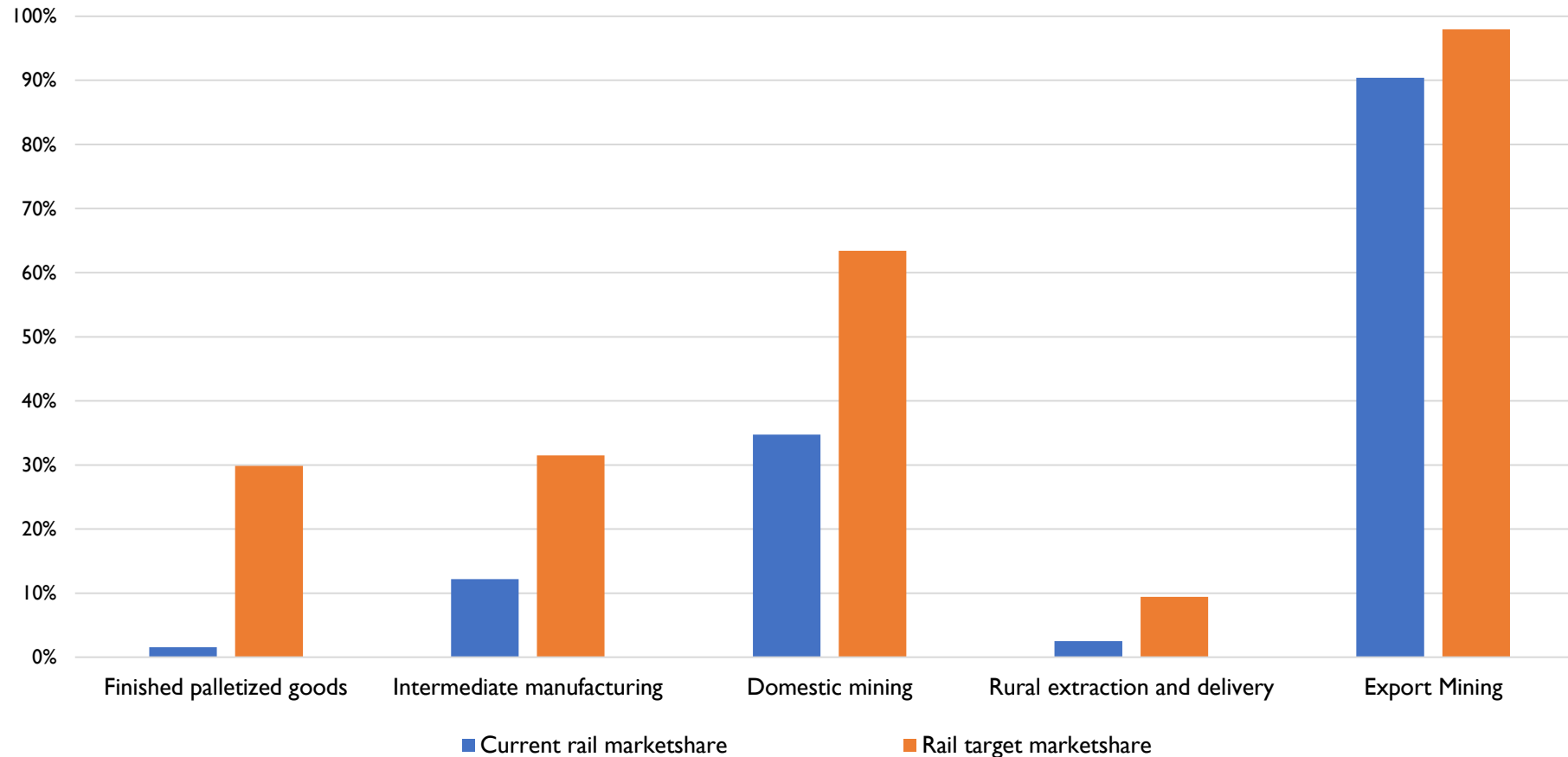


## This results in five overarching freight typologies which can inform modal shift opportunities

Typology	Description
<b>Rural extraction and delivery</b>	The flow of agricultural bulk from rural areas and delivery of consumer goods to these areas
<b>Large volume export mining flows</b>	Exports of coal, iron ore and manganese
<b>Domestic mining flows</b>	Movement of local minerals to domestic beneficiation centres
<b>Intermediate manufacturing flows (siding to siding)</b>	Flow of semi-beneficiated commodities between intermediate and final processing facilities
<b>Finished palletised goods</b>	The flow of FMCG commodities of higher value between manufacturing facilities, distribution centres and retailers

“Ring-fenced” flows such as bulk liquid buoys and pipelines and conveyor belts are excluded from this analysis

# The biggest market share gap is in palletised freight

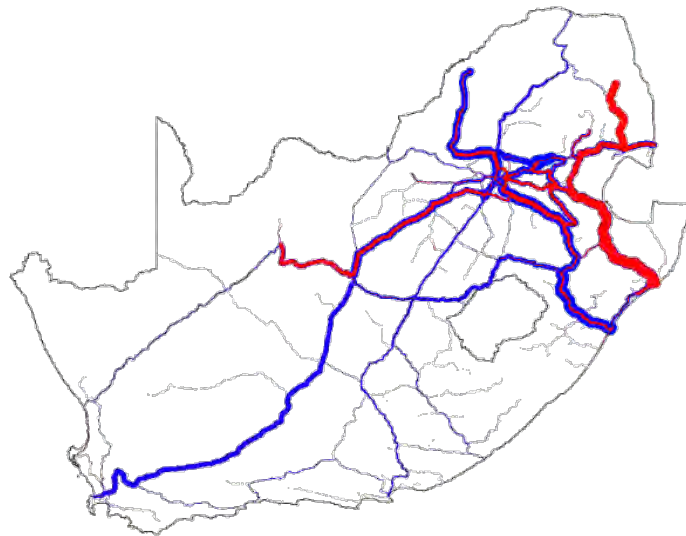


Rail has 78% market share of rail-friendly freight tonne-km and 65% of rail-friendly tonnes.

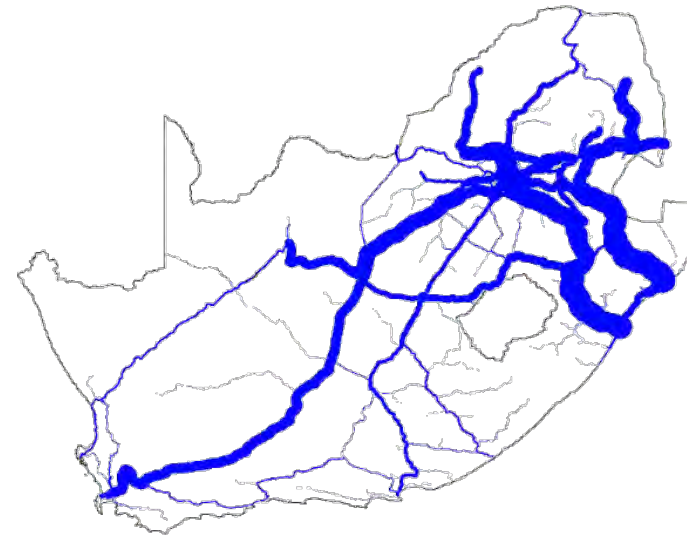


# GFB performance is less than half of what it should be and must quadruple by 2050

**Today**  
(**What it is** and **what it should be**)



**2050**  
(**What it should be**)



Source: GAIN South Africa Freight Demand Model™

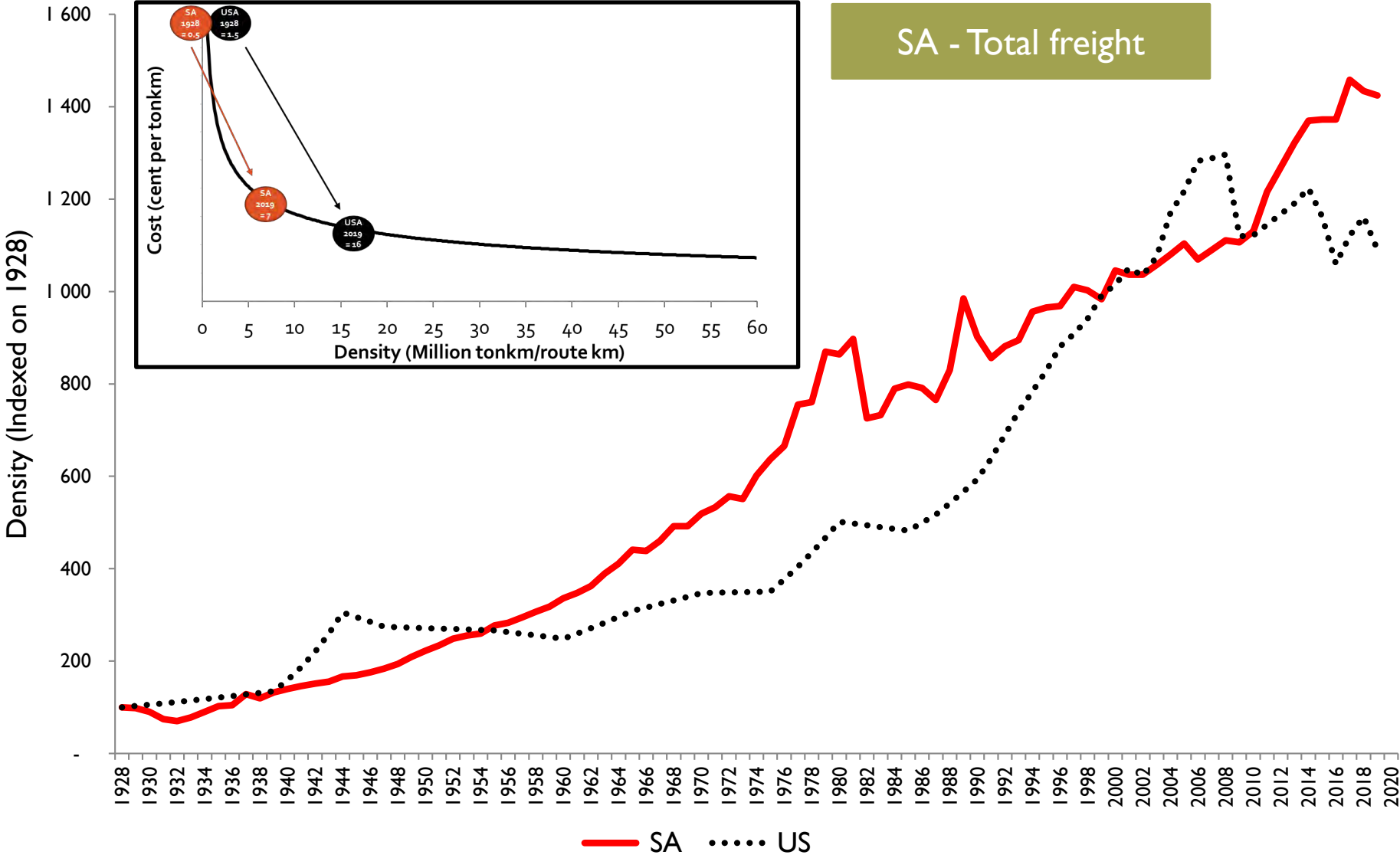
Current tonne-kms of 18 billion should be 47 billion tonne-kms and should reach 77 billion tonne-kms by 2050.

# The result of rail under performance in these segments are telling

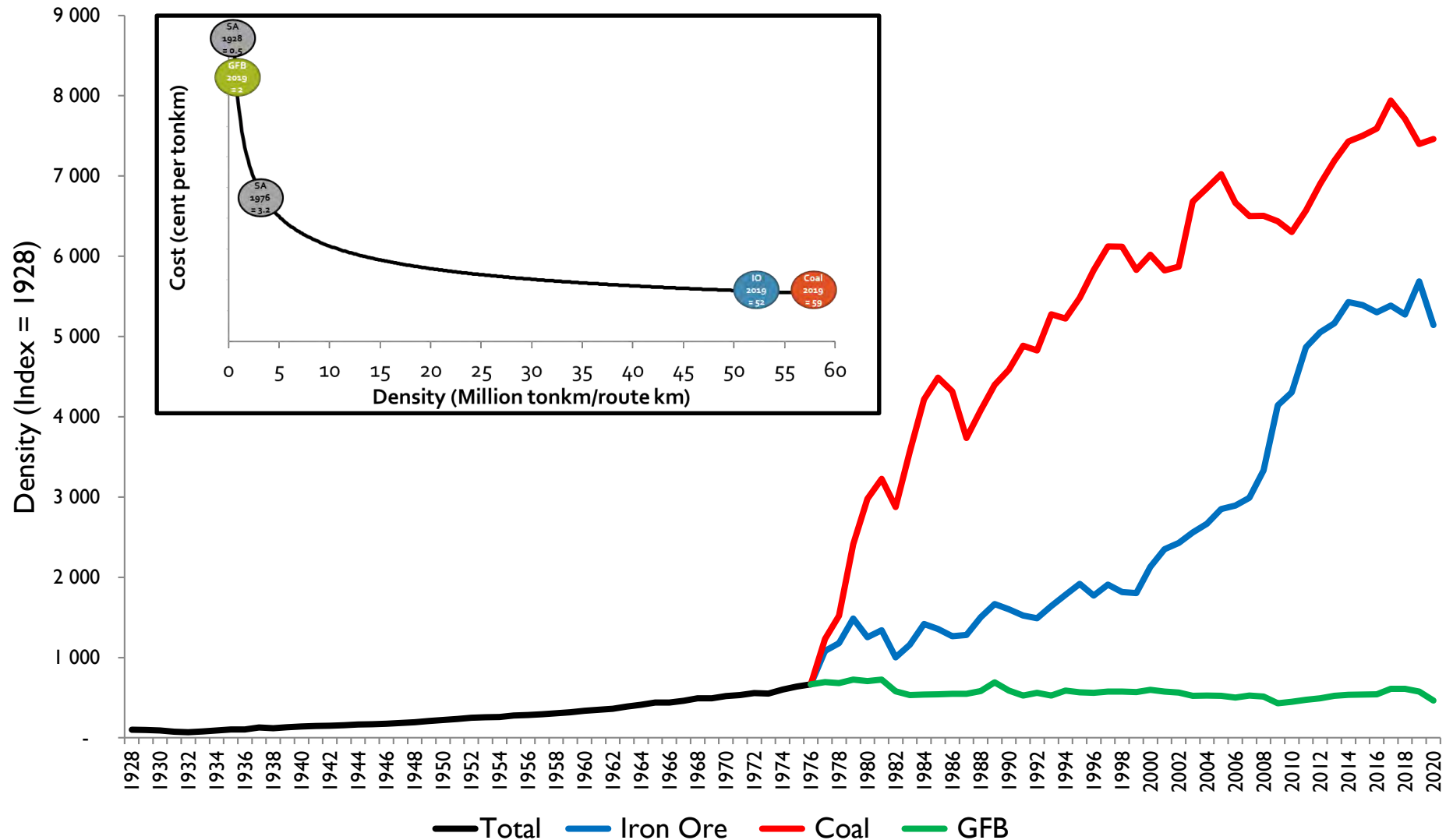
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- Export lines – Missing 11 billion tonne-kms export minerals hampers economic growth
- Domestic minerals – missing 9 billion tonne-kms destroys rural roads
- Missing 8 billion tonne-km intermediate manufacturing hampers industrial supply chains and increase non-optimal road corridor freight
- Missing 10 billion tonne-kms due to no domestic intermodal increases the cost of final delivery and also increase non-optimal road corridor freight
- An additional 4 billion tonne-kms can also relieve stress on rural roads and improve agricultural supply chains

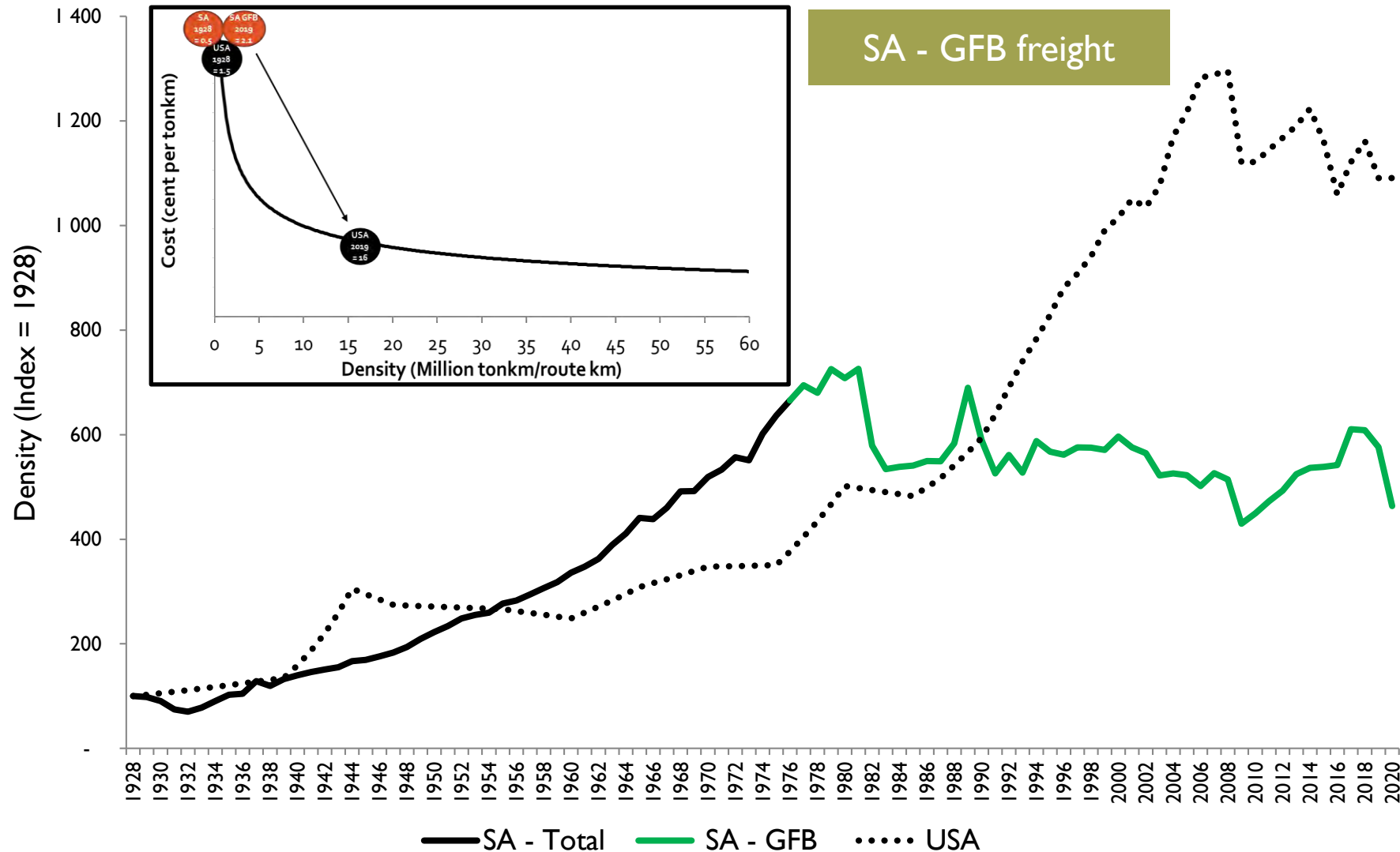
# South Africa's 'density index' for total rail freight compares well



# Segmented rail density index development confirm that rail density is driven by the export lines



# The density gap for GFB is enormous – it is not only a service delivery problem – the rail network is too large



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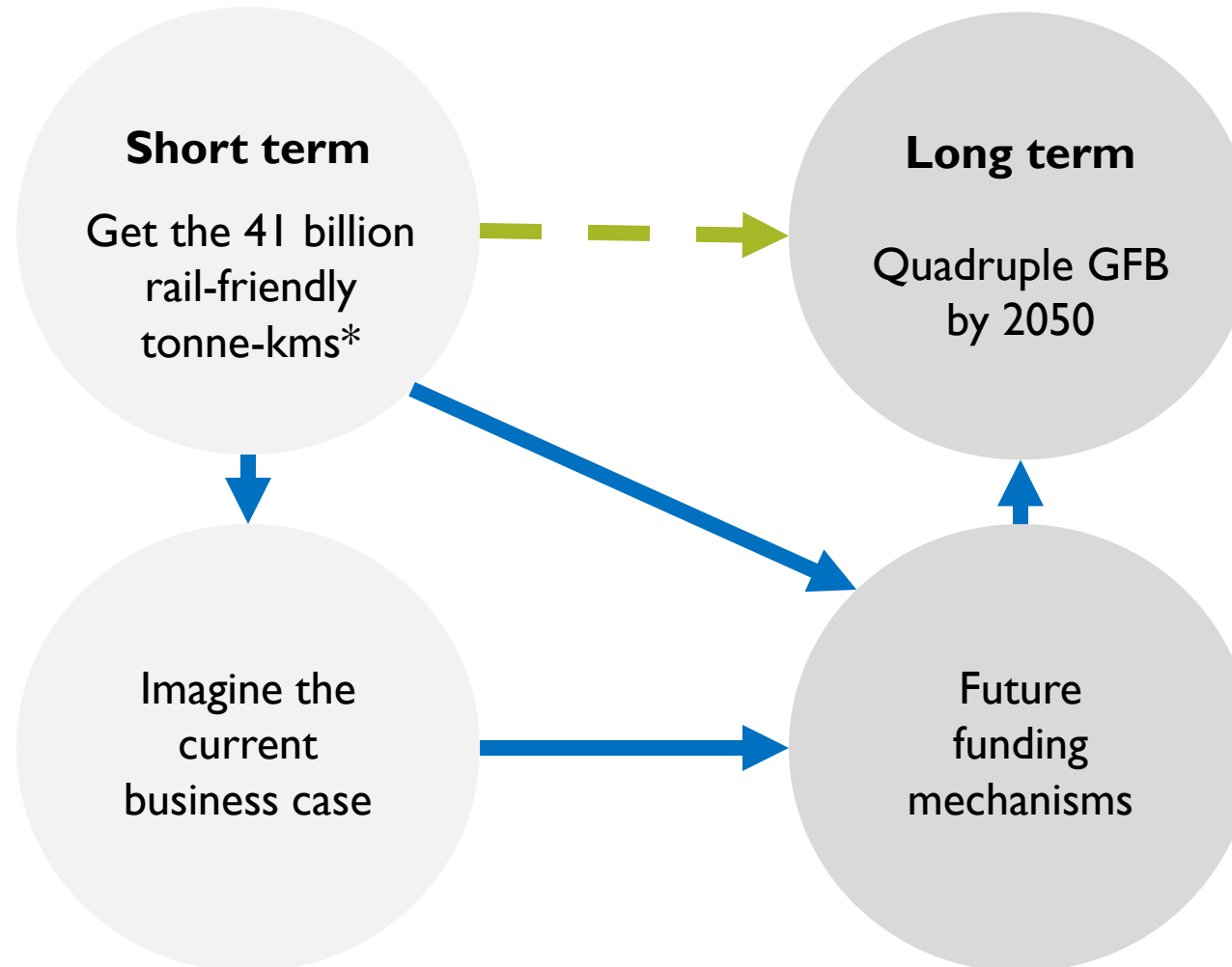
# The current climate

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- Despondency is palpable
- The gap is a supply gap
- Informed respondents understand vandalism effect
- Lack of stewardship caused by personnel “moving around”
- ***Despite all this, freight owners stated their intent to use rail***
- ***And LSP’s stated their intent to collaborate***

# Key strategic objectives can be considered short and long term

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\*11 billion tonne-kms export minerals and 30 billion tonne-kms general freight



# The deal sheet for the 41 billion tonne-kms is positive

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- 11 billion tonne-kms export minerals = R 3 billion at current tariffs
- 30 billion tonne-kms general freight = R 18 billion at current tariffs
  - Assuming 20% discount on half of additional general freight = R 16 billion additional income
- Additional export minerals + general freight = increased revenue of **R 19 billion**
- Additional costs consider returns to density:
  - Even at current cost structure, given 20% loss assumption, but 70% returns to density = **R 7 billion** additional costs
- Net positive business case **R 12 billion** – requires 3 strategies to realise:
  - Invest
  - Improve asset utilisation – remove operational constraints
  - Improve service levels, stewardship and product design

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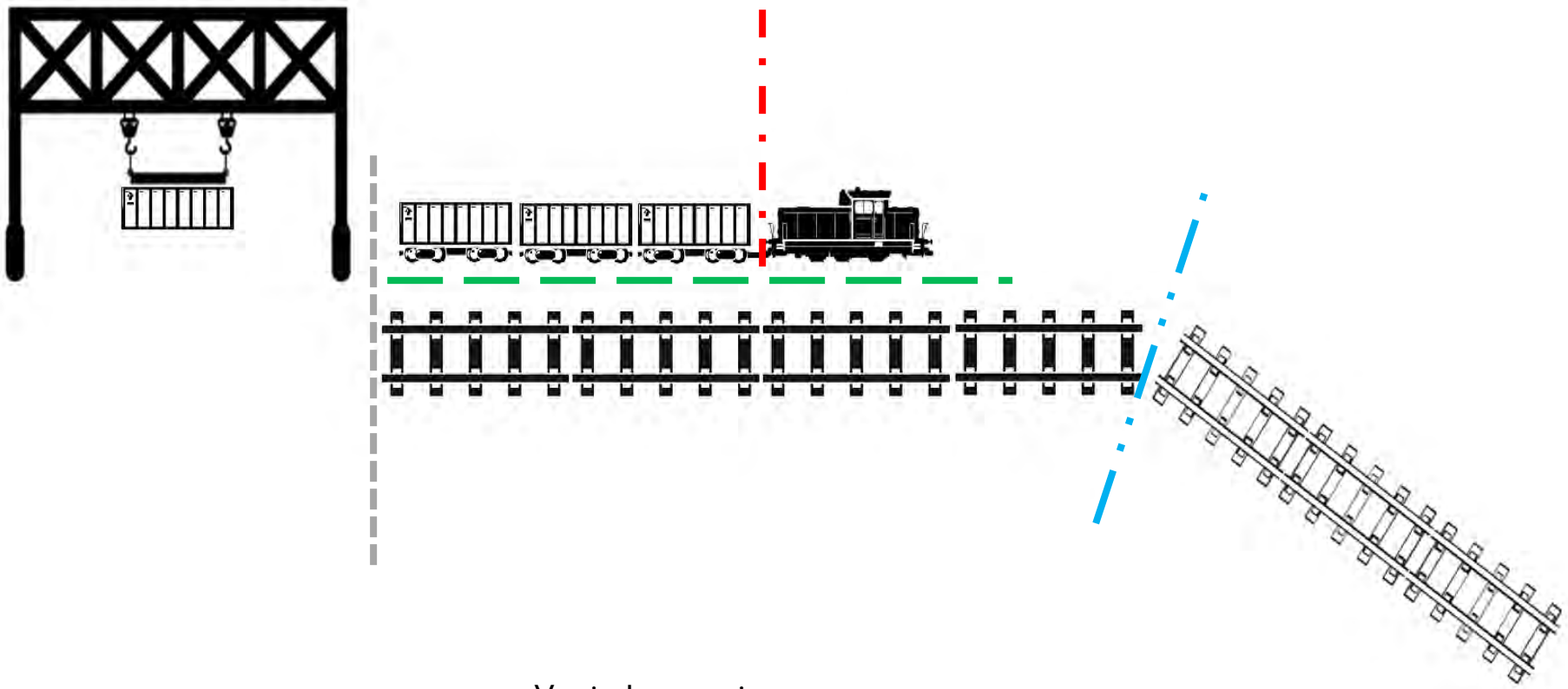
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# Quadrupling general freight by 2050

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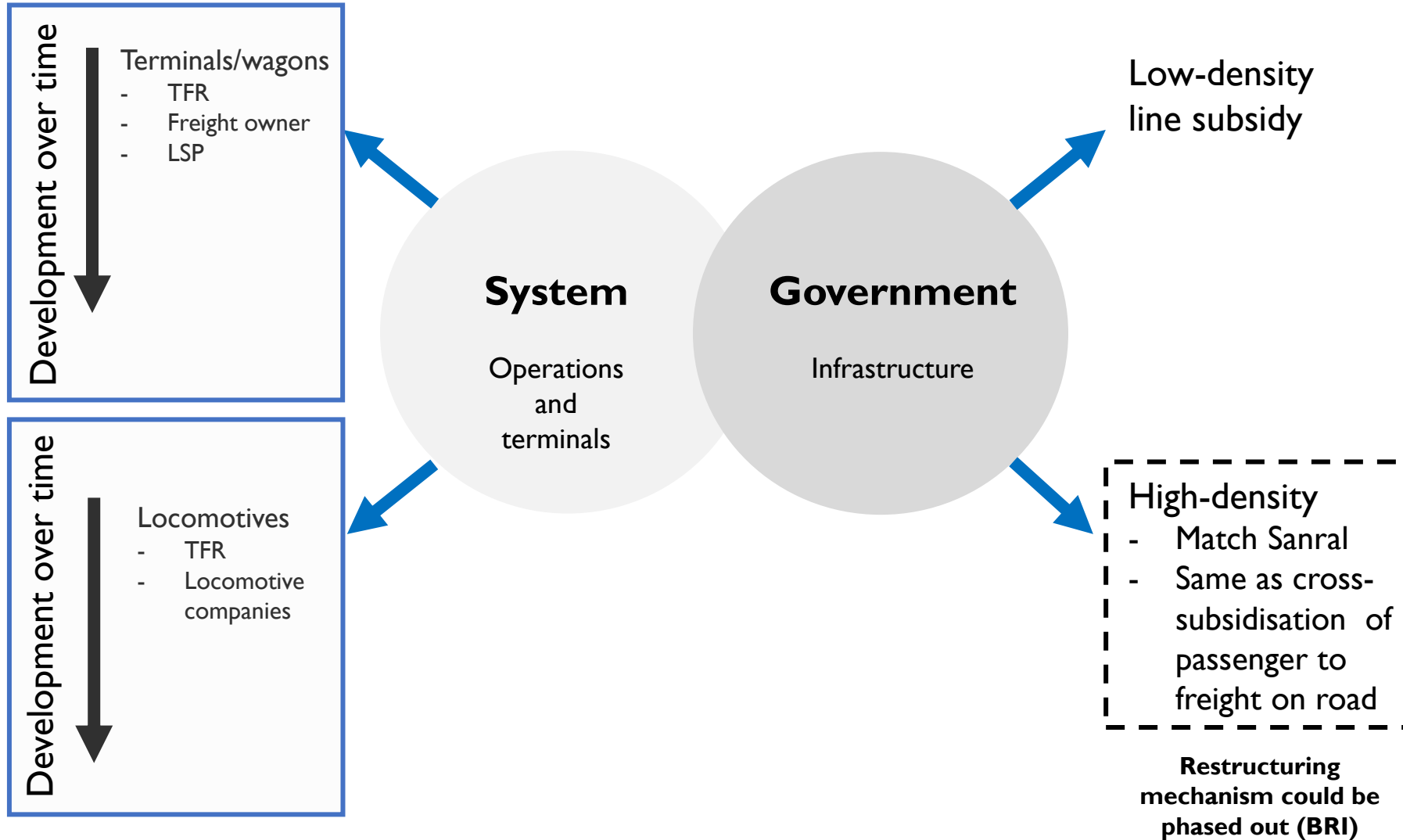
- This should be a long-term strategic focus of the **country**
- It will require interventions from all involved, not only TFR and DoT
- The investment case is sound, in all respects
  - It is data-driven
  - Acceptable by all
- Structure and funding is what is required

# Separation is a broad concept



-  Vertical separation
-  Horizontal separation between low – and high-density lines
-  Horizontal separation between terminals and operating slots
-  Horizontal separation between locomotives and wagon fleets

# There are different funding mechanisms



# The drive to success is now panrail

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- A new rail policy seems to have finally succeeded
  - This opens the door for sustainable evidenced based planning
- Open access (with a dominant operator) is now a given
  - Financial separation should now be completed
  - The next move will be to full open access
- The solution will involve a much broader community

# The new challenges could be

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- Effective low density – high density split
- Sensible infrastructure provision and charges (all modes)
- Competitive slot pricing
- Real open access

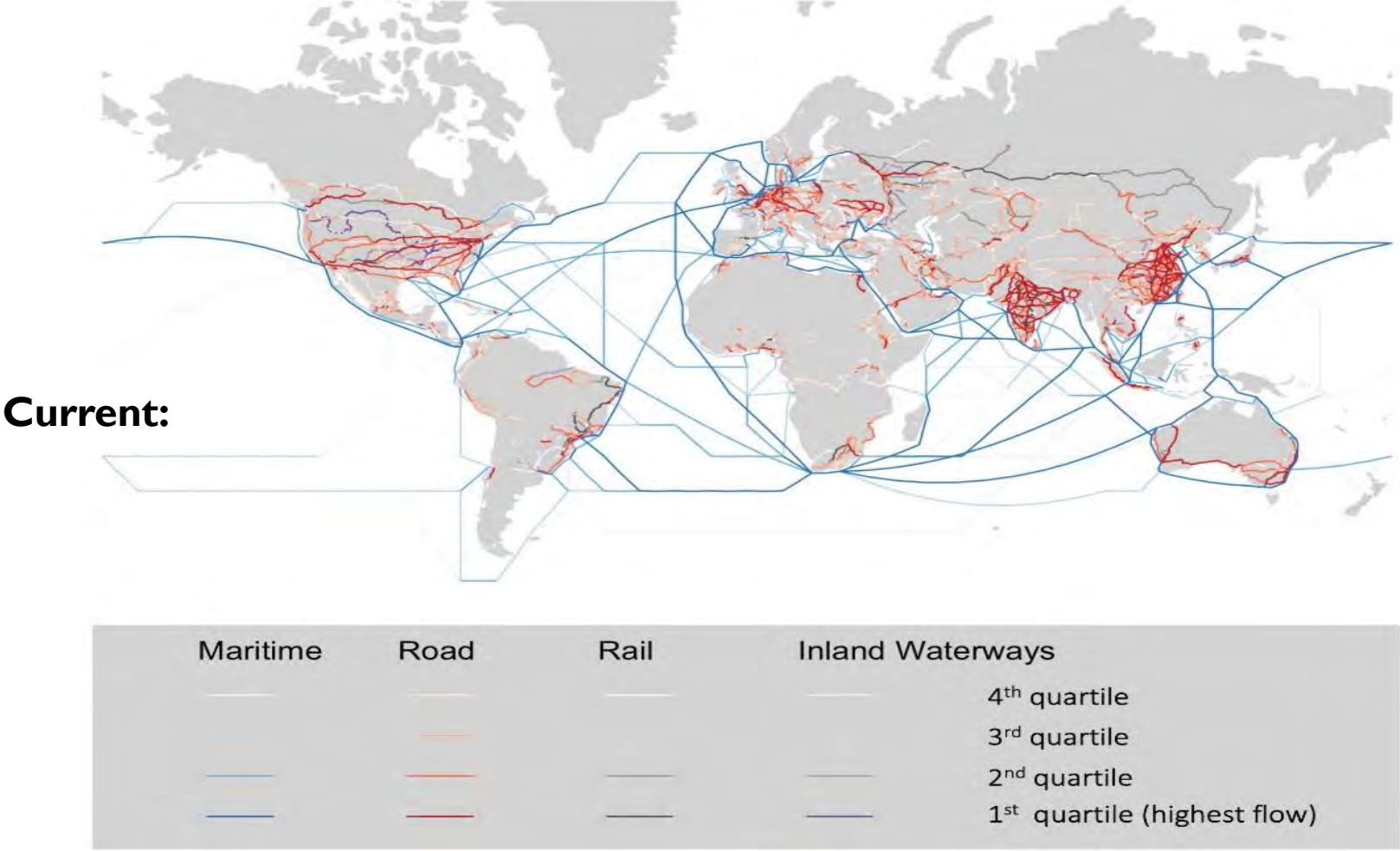
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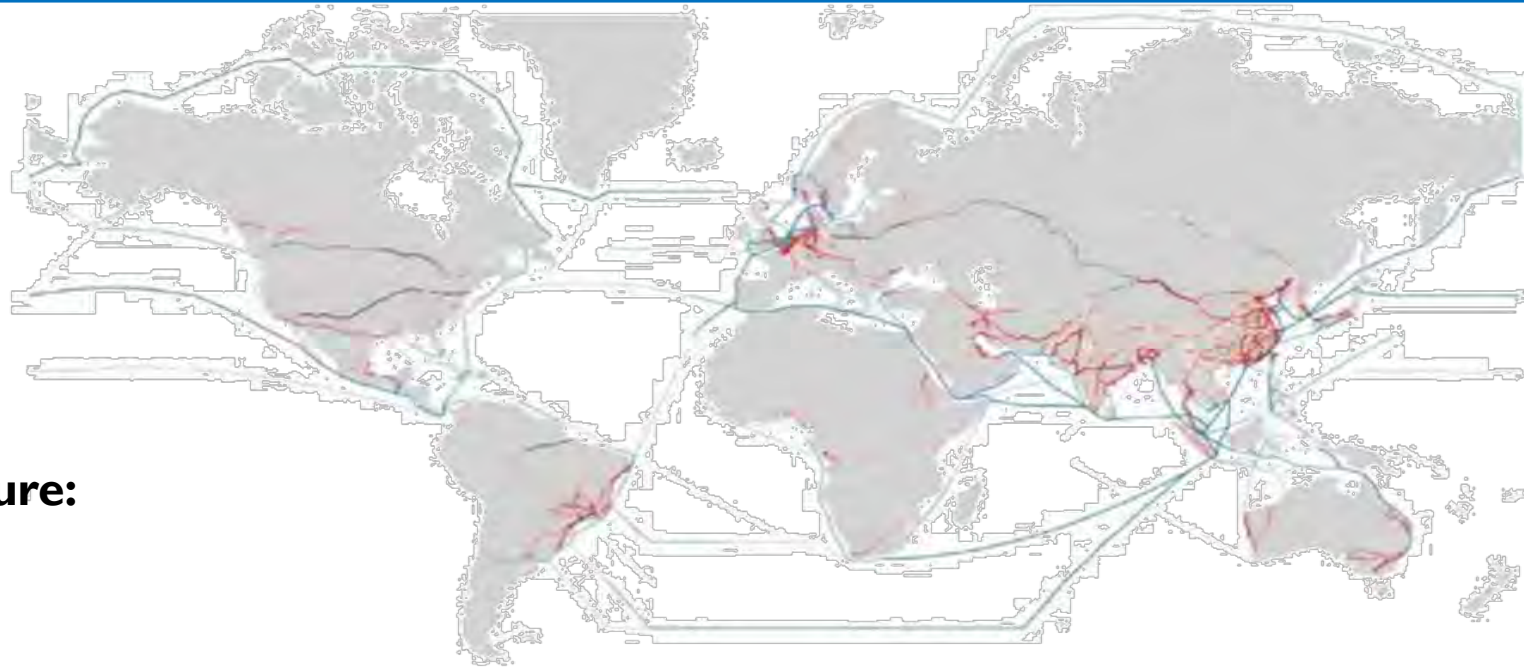
# Global freight flow model linkup – 4 reference clusters in the world



North America, Russia, India, China and Europe describe world flows

# Changes in global freight flow

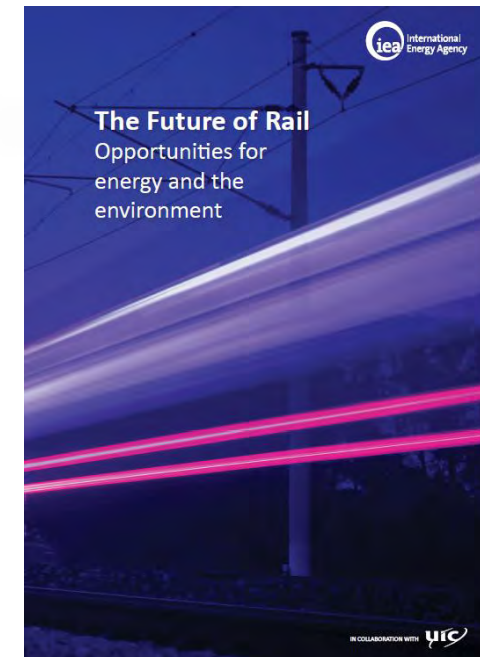
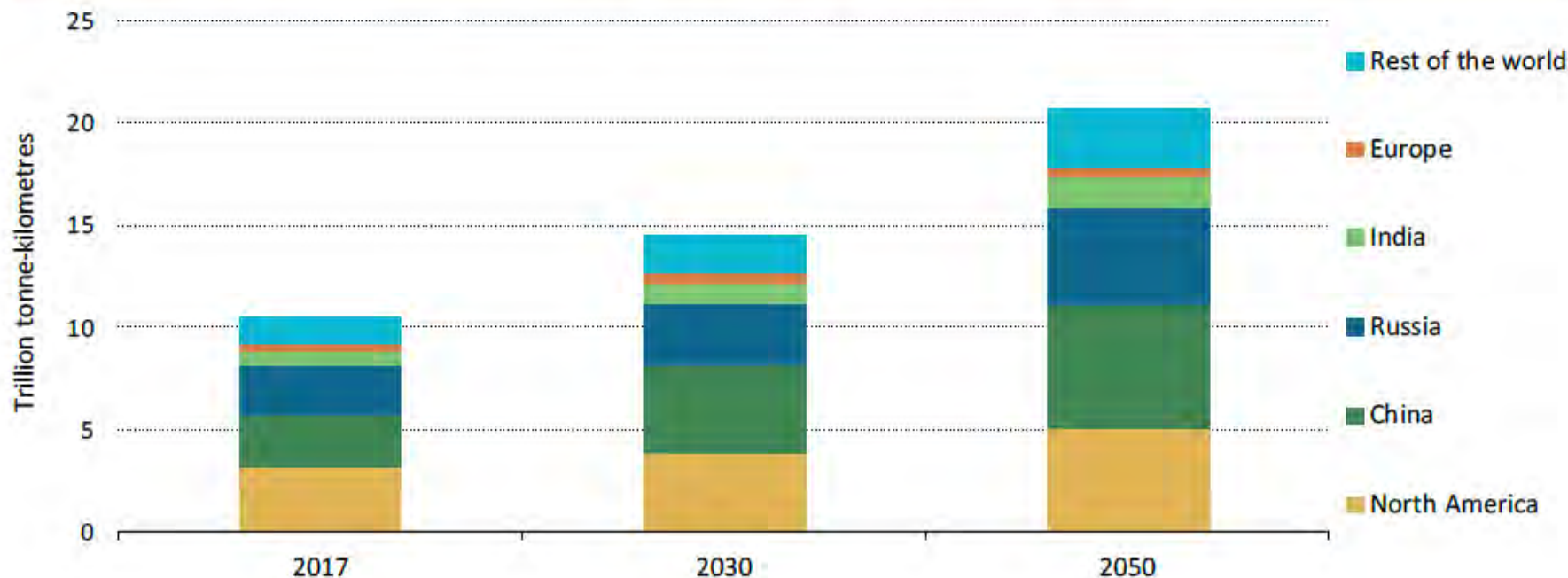
Future:



The Cape corridor?

# Global rail must at least double, while here, it must quadruple

Figure 2.9 Global freight rail activity by region in the Base Scenario, 2017, 2030 and 2050

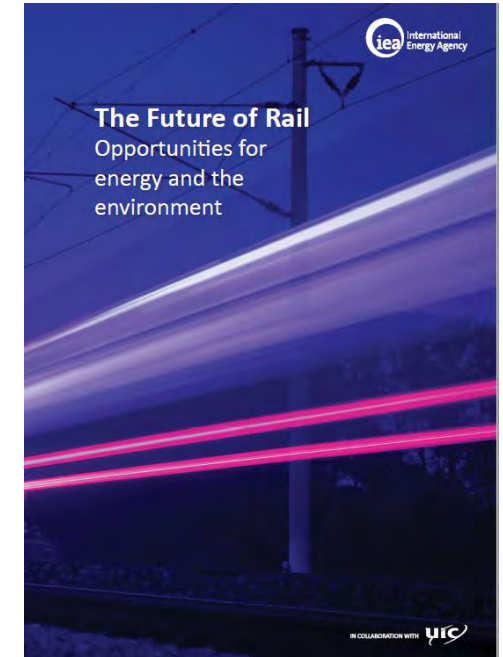
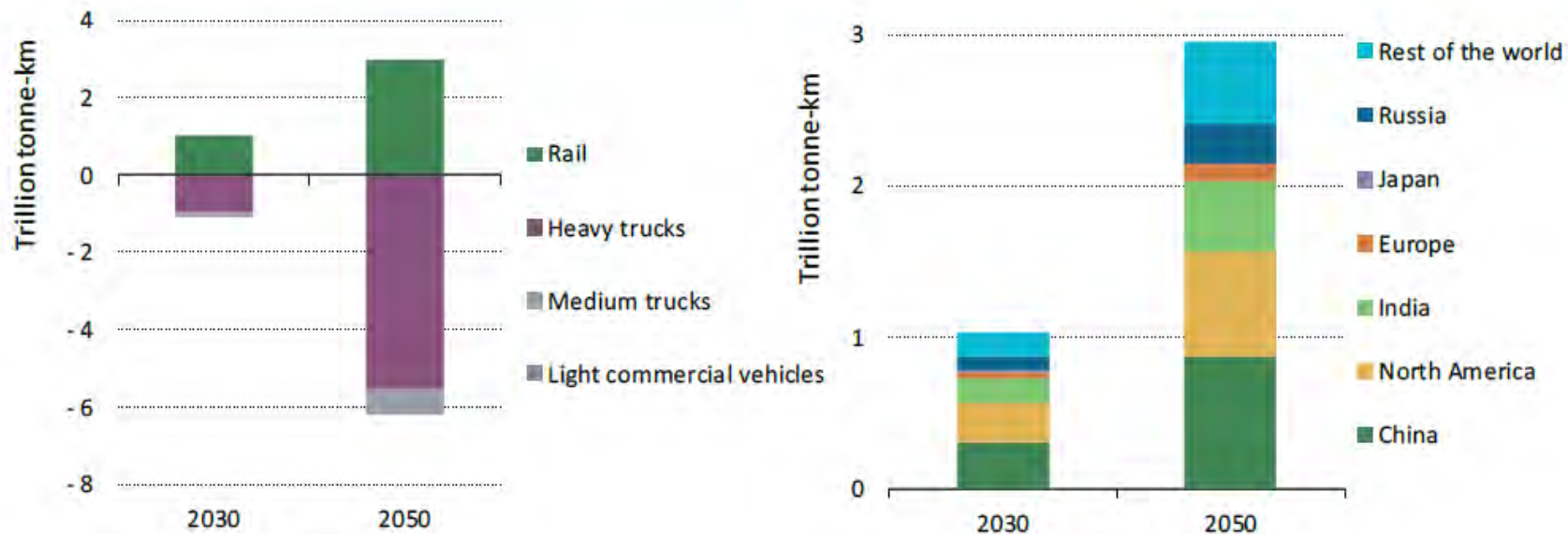


Source: IEA. 2019. *The Future of Rail – Opportunities for energy and the environment*. [Paris]: International Energy Agency.

Future rail freight will be seamlessly inserted in supply chains

# The world is planning for rail economical modal shift

**Figure 3.12** Change in surface freight transport activity (left) and freight rail activity (right) in the High Rail and Base scenarios, 2030 and 2050



**Source:** IEA. 2019. *The Future of Rail – Opportunities for energy and the environment*. [Paris]: International Energy Agency.

Reshoring is causing a maritime to overland shift.  
Guided transport must return for where it makes economical sense.



# The future of rail has a direct link to mankind's survival

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- A world without mass guided transport will be a failed world
- The same is true of South Africa

An active and vibrant railway system confers many benefits on society.

Olumyemi Osinbajo

Let us imagine ourselves transferred to our old friend, the railway carriage...

Albert Einstein