

The future of Agrologistics

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Discussion

- Who we are
- South Africa's logistics problem
- The position and performance of Transnet
- Reform
- The future?

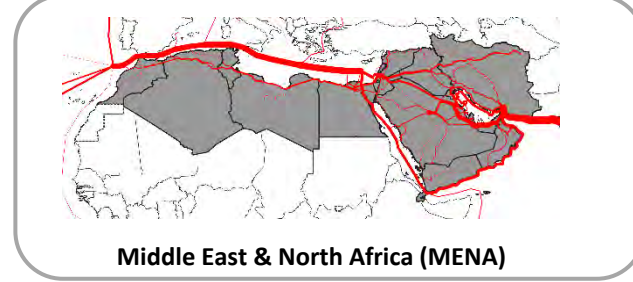
Who we are

How much of what moved where and how and at what cost?

- Tonnage
- TEUs
- Tonne-km
- Import/Export/Domestic
- Commodities
- Origins & Destinations
- Road/rail/pipeline/waterway
- Containers/bulk

Africa

Other



We include as many variables as possible:

- Costs
- Other activities: cash to cash cycle / warehousing / administration
- Including all externalities: emissions / noise / congestion / policing / accidents / land use

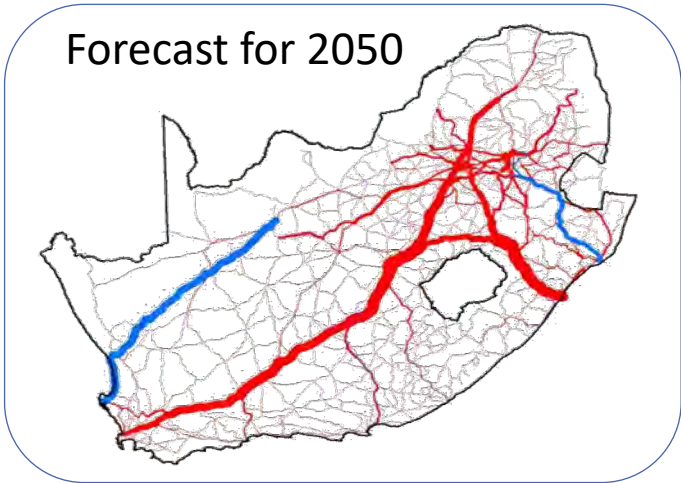
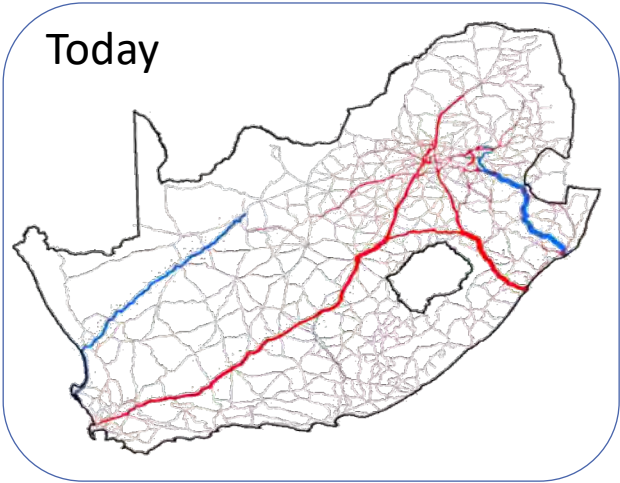


The objective is to map economies in motion and find the supply chain solutions for improvement.

Discussion

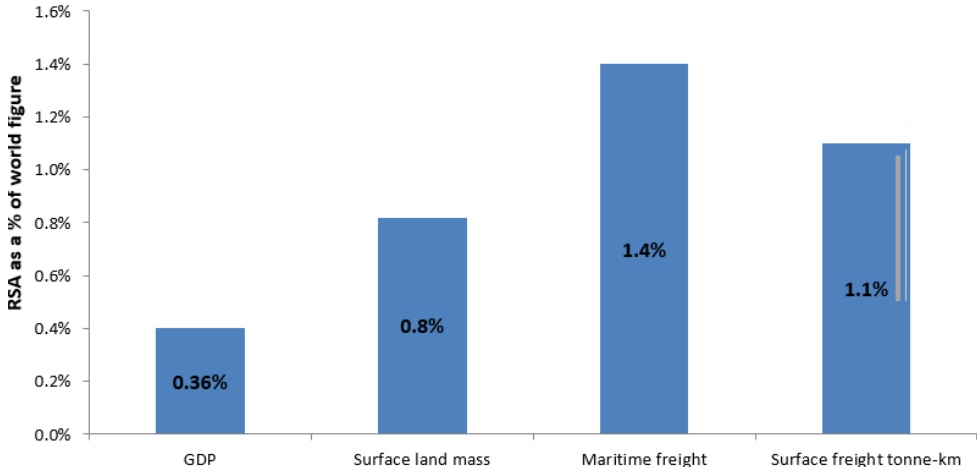
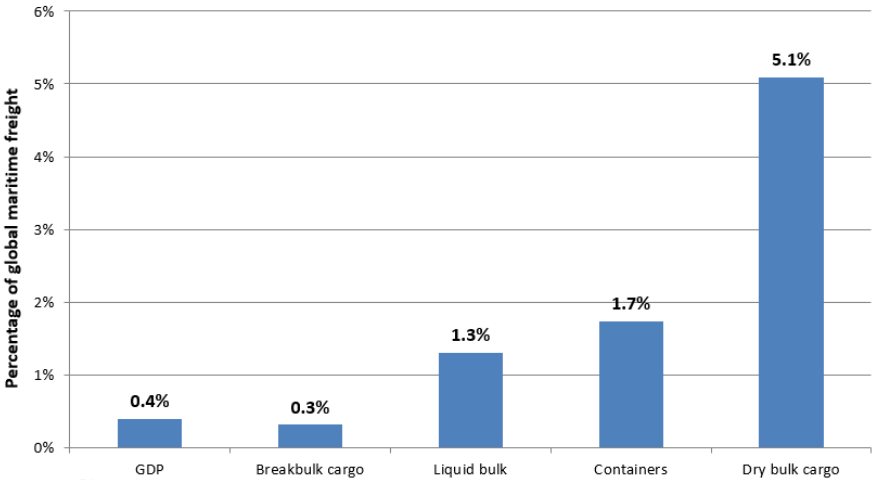
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South Africa's freight demand is high



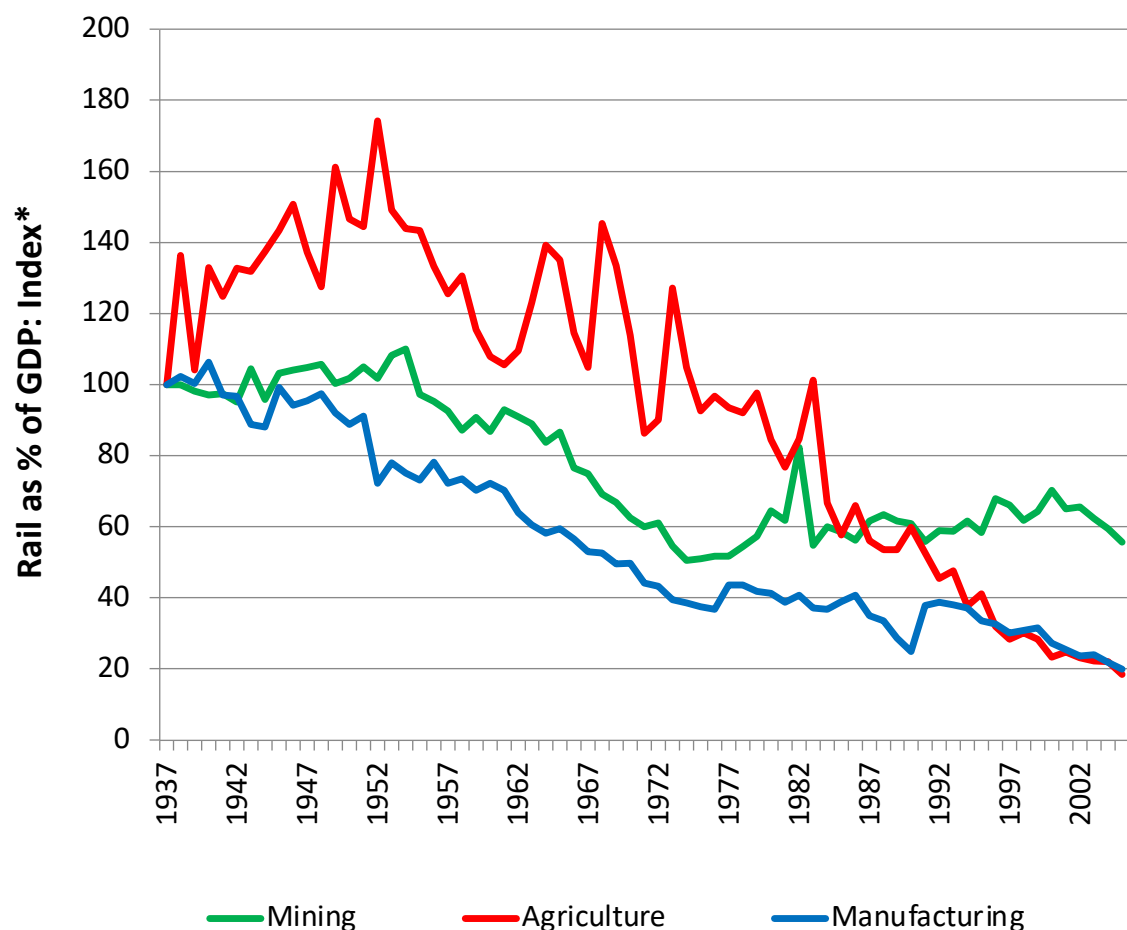
- GDP**
- South Africa
\$0.35 trillion
 - France/Germany
\$6.26 trillion

Note: In the maps above, the red lines indicate all freight flows and the blue lines indicate dedicated export line flows.

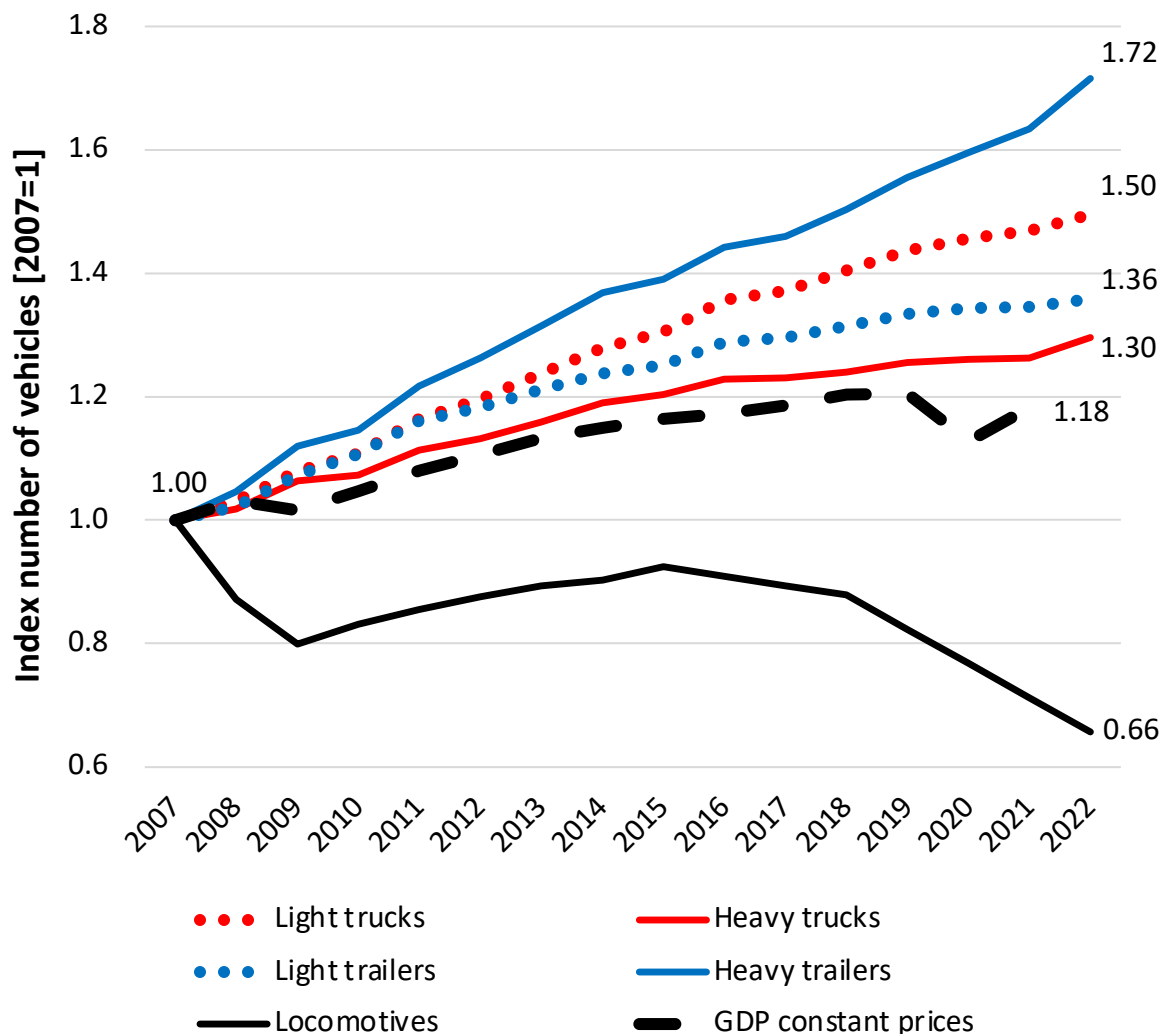


SA's landmass is about equal to Germany and France combined, while its GDP is nearly 18 times smaller.

With an accelerating and sometimes unnecessary move to road supply



*Indexed correlation of the relationship between rail transport and physical production in the economy



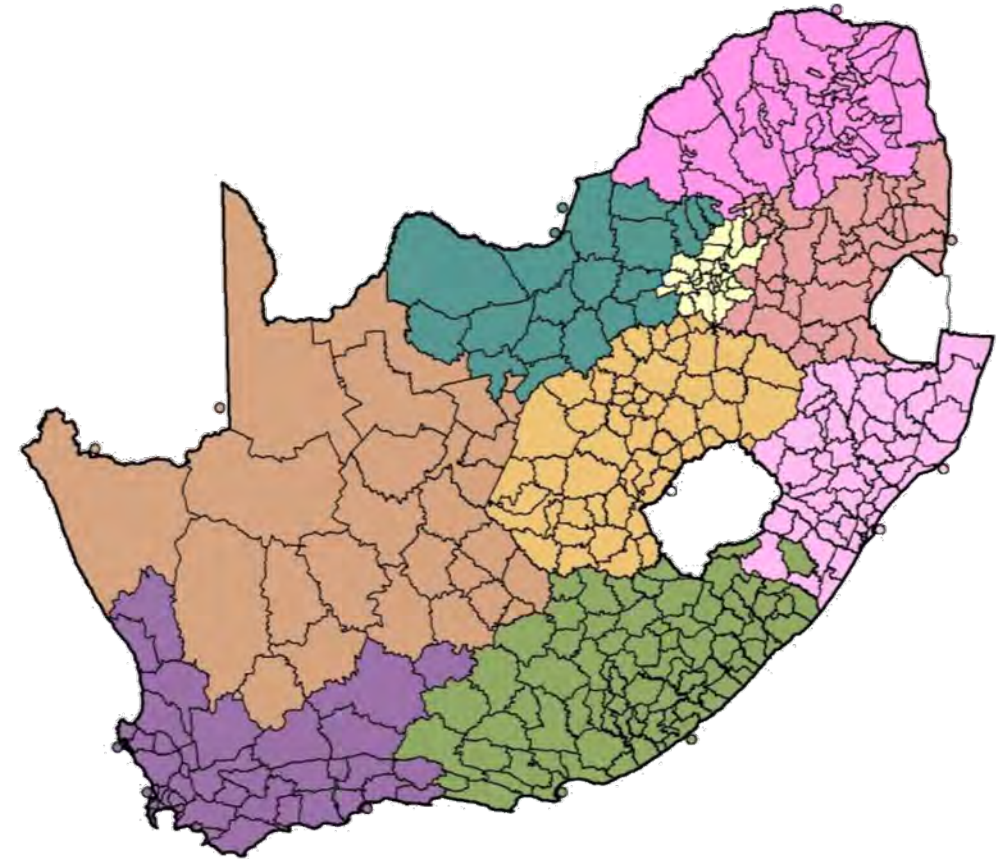
We map 372 origin/destination pairs

- **372 District regions**

- 356 Districts in South Africa
- 8 Border posts
- 7 Ocean ports
- 1 Airport

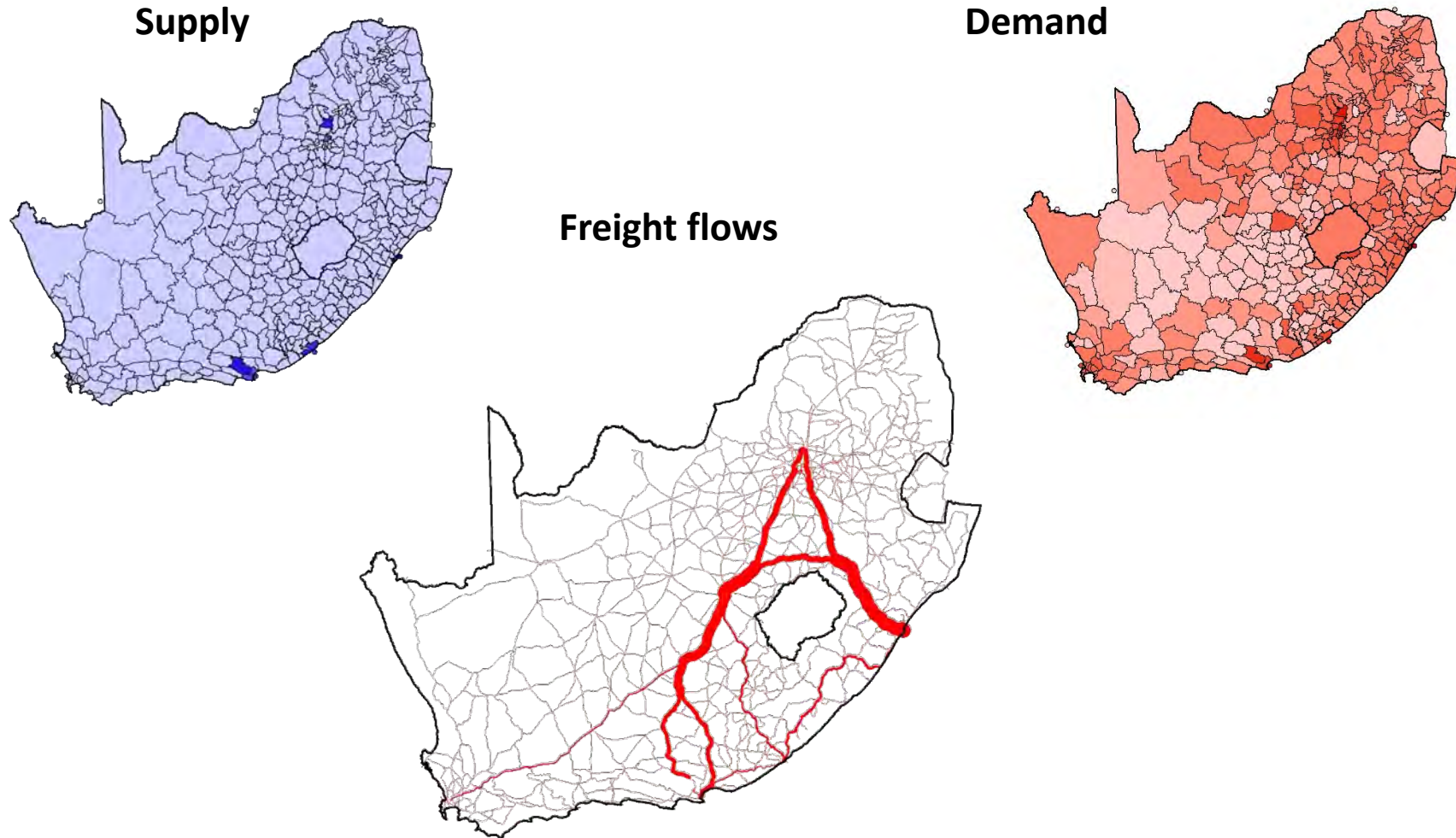
For each origin and destination 83 commodities

- Production
- Consumption
- Imports
- Exports
- Road/Rail/Sea/Pipeline/Conveyor belt
- Tons/Tonkilometers/Cost



Model OD flows from Supply and Demand

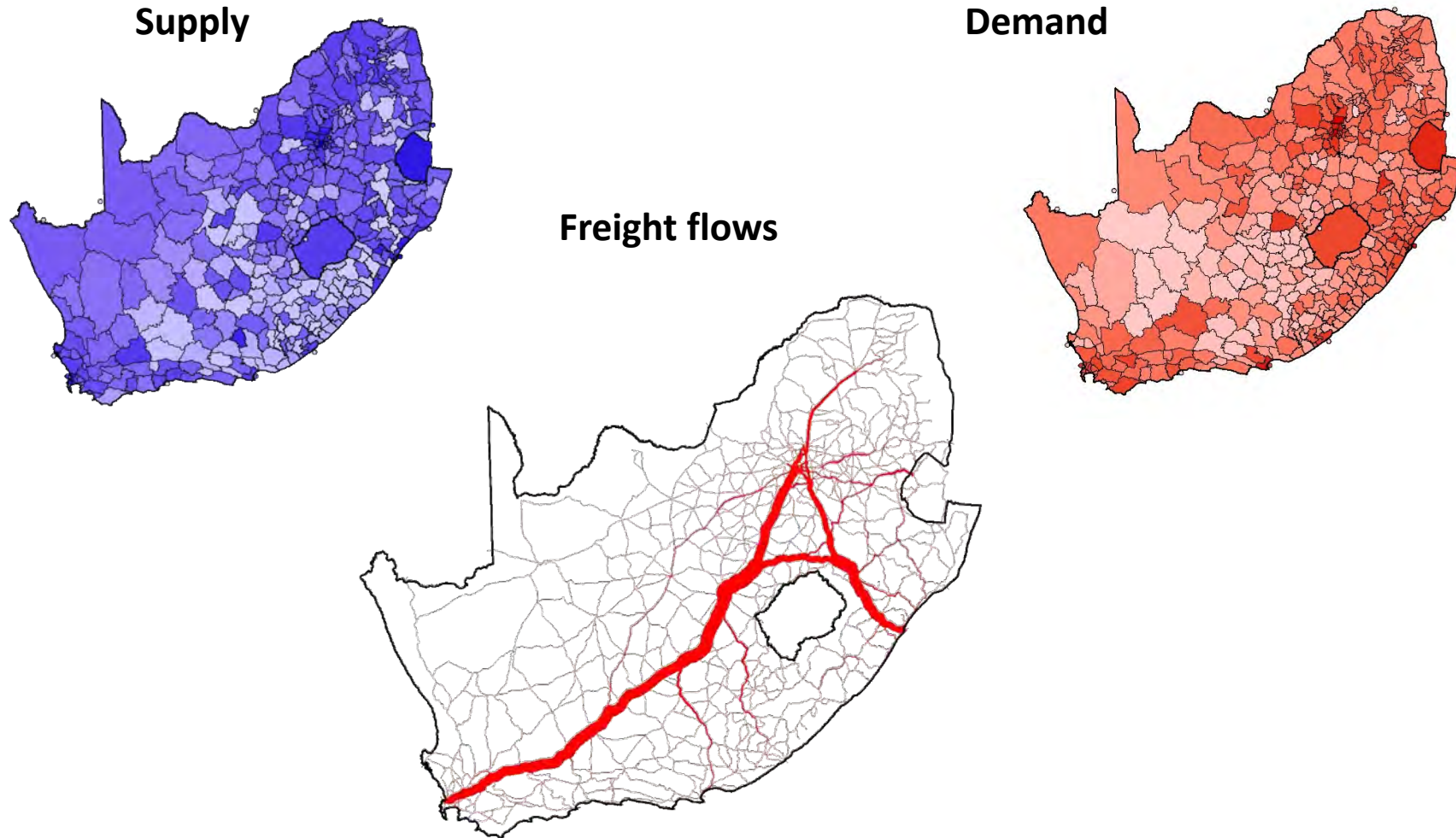
South African example – Motor vehicles



Source: GAIN Freight Demand Model™

Model OD flows from Supply and Demand

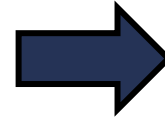
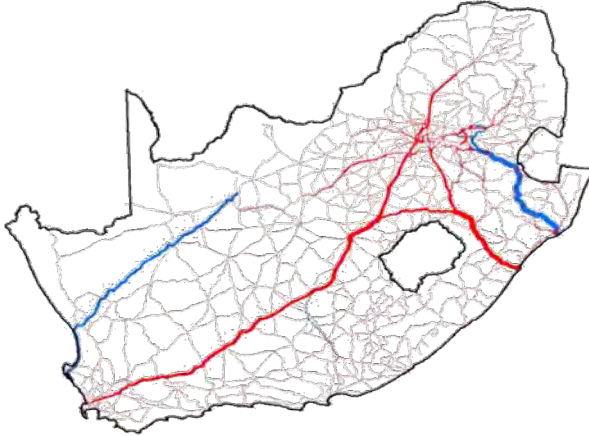
South African example – Processed foods



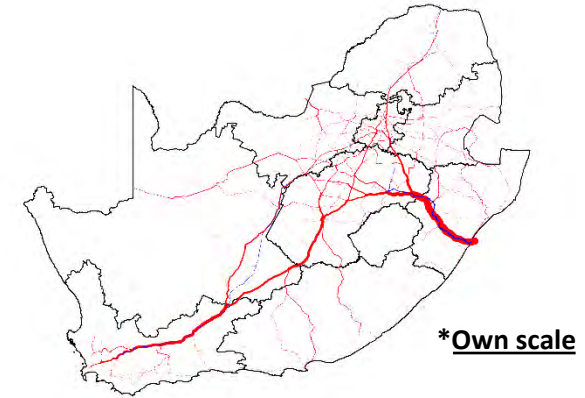
Source: GAIN Freight Demand Model™

Agriculture needs both rural connectivity and efficient corridors

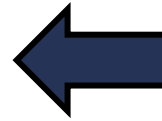
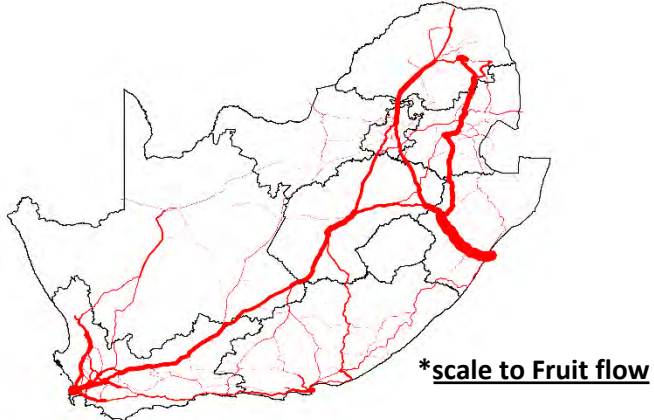
All flows



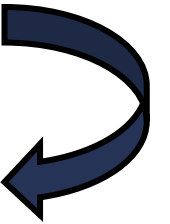
Agricultural flows



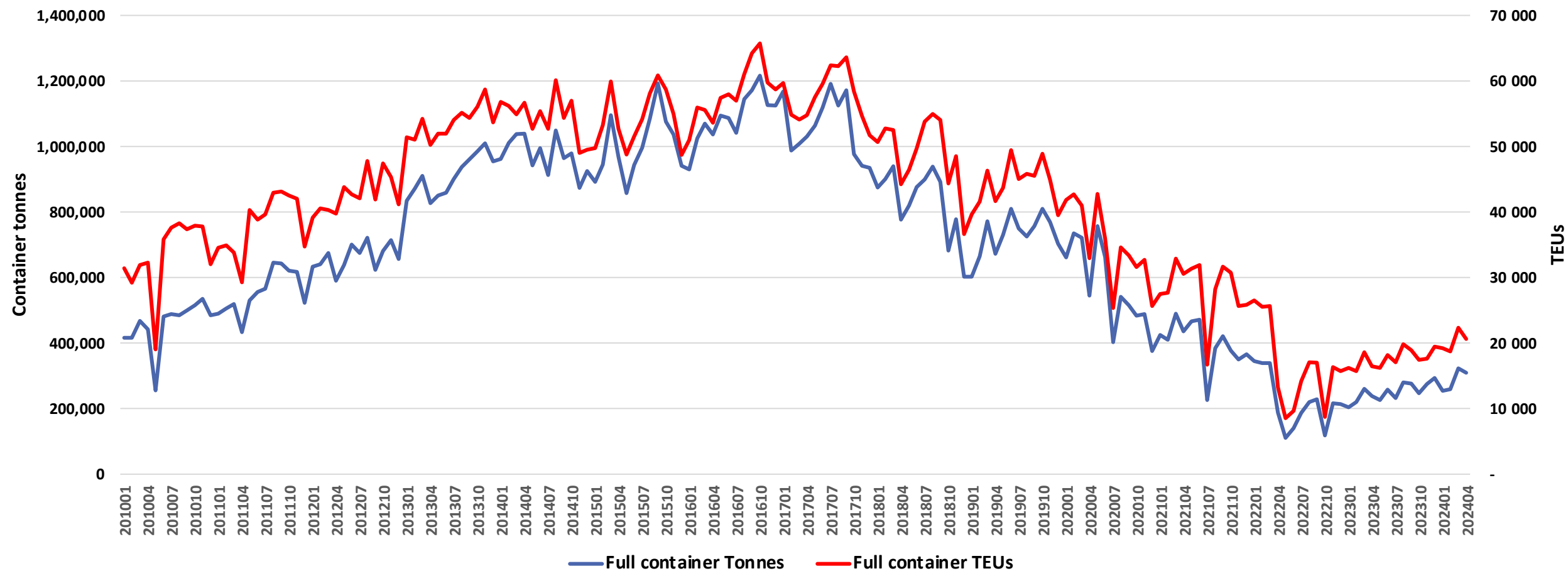
Fruit flows 2052



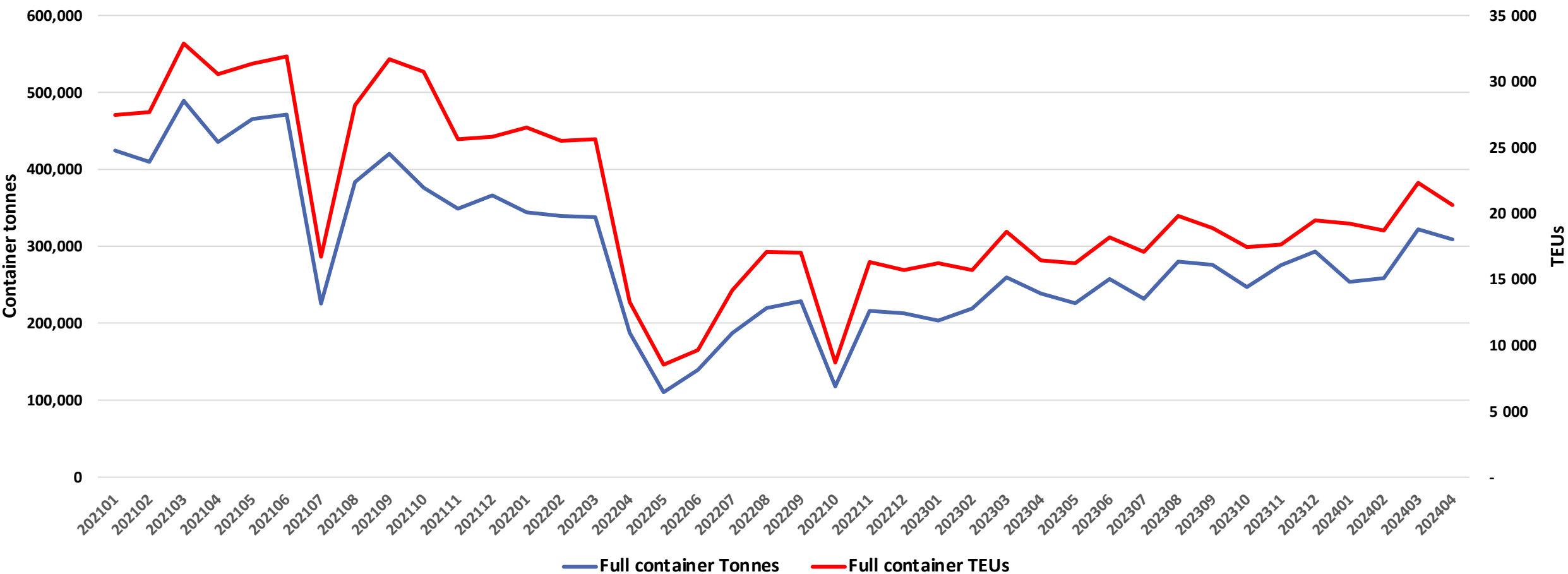
Fruit flows



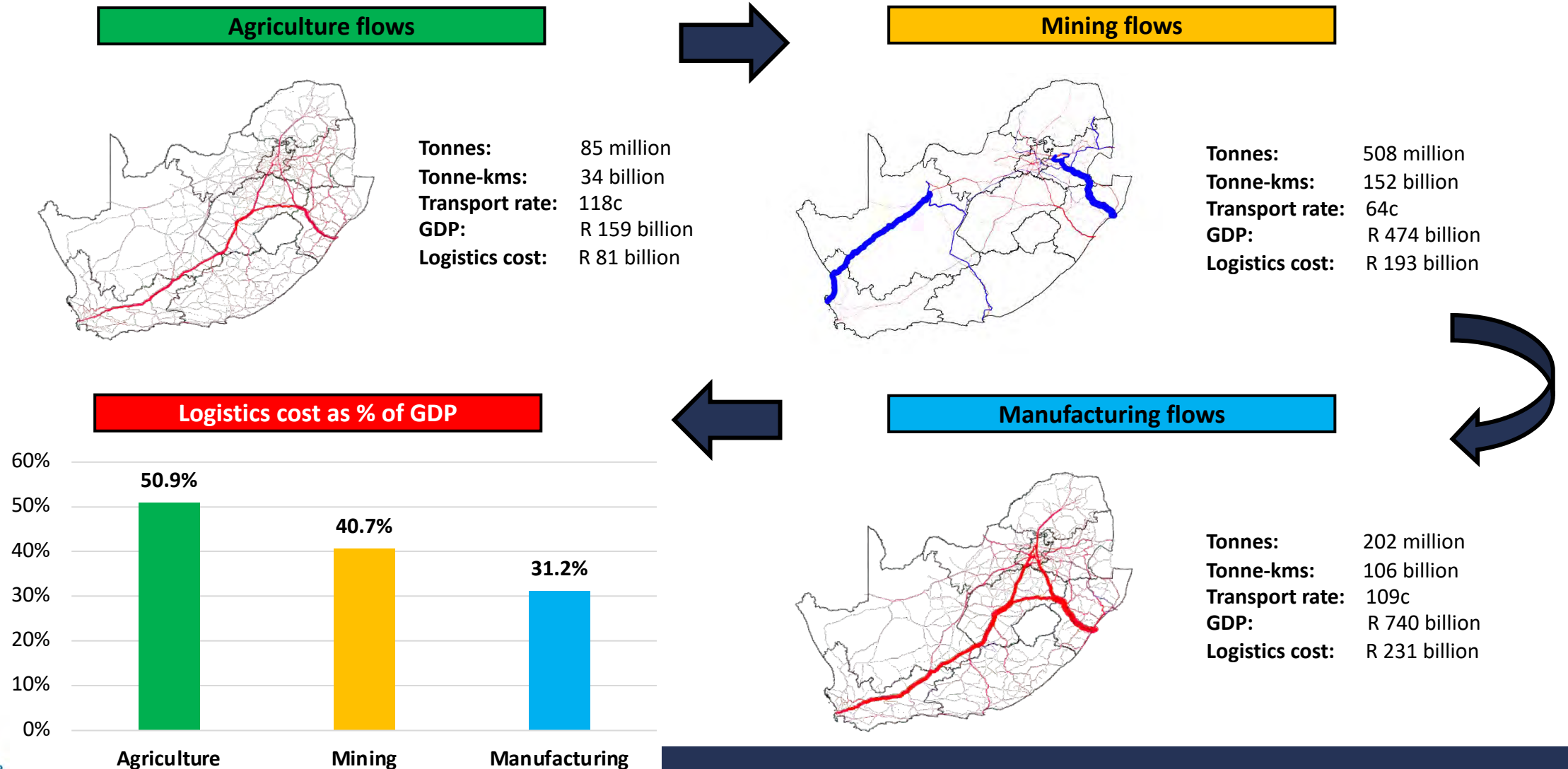
TFR Containers are slowly turning around



Monthly view confirms it

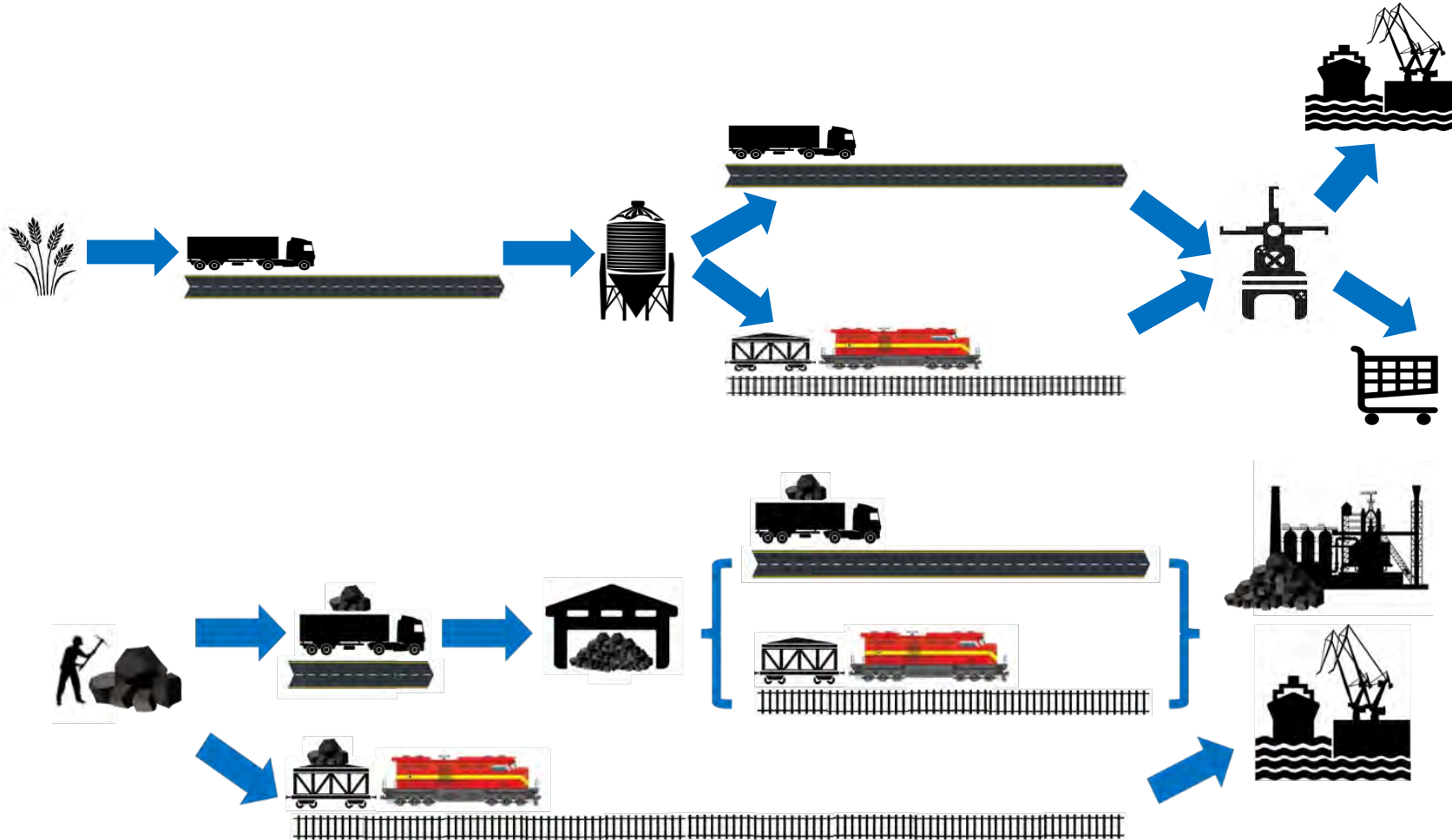


Logistics is a bigger input into final output compared to all other commodities



Very high for agriculture and far more than 50% for fruit

It's all about value chains



Government support value chains – ultimate objective

Integrated planning is missing to support this processes

The **modalities have issues**, but a **lack of integration** leaves gaps

Government's role:

- **Policy:** No integration on all levels causes business problems

- **Infrastructure:** Apart from modal challenges – terminal issues

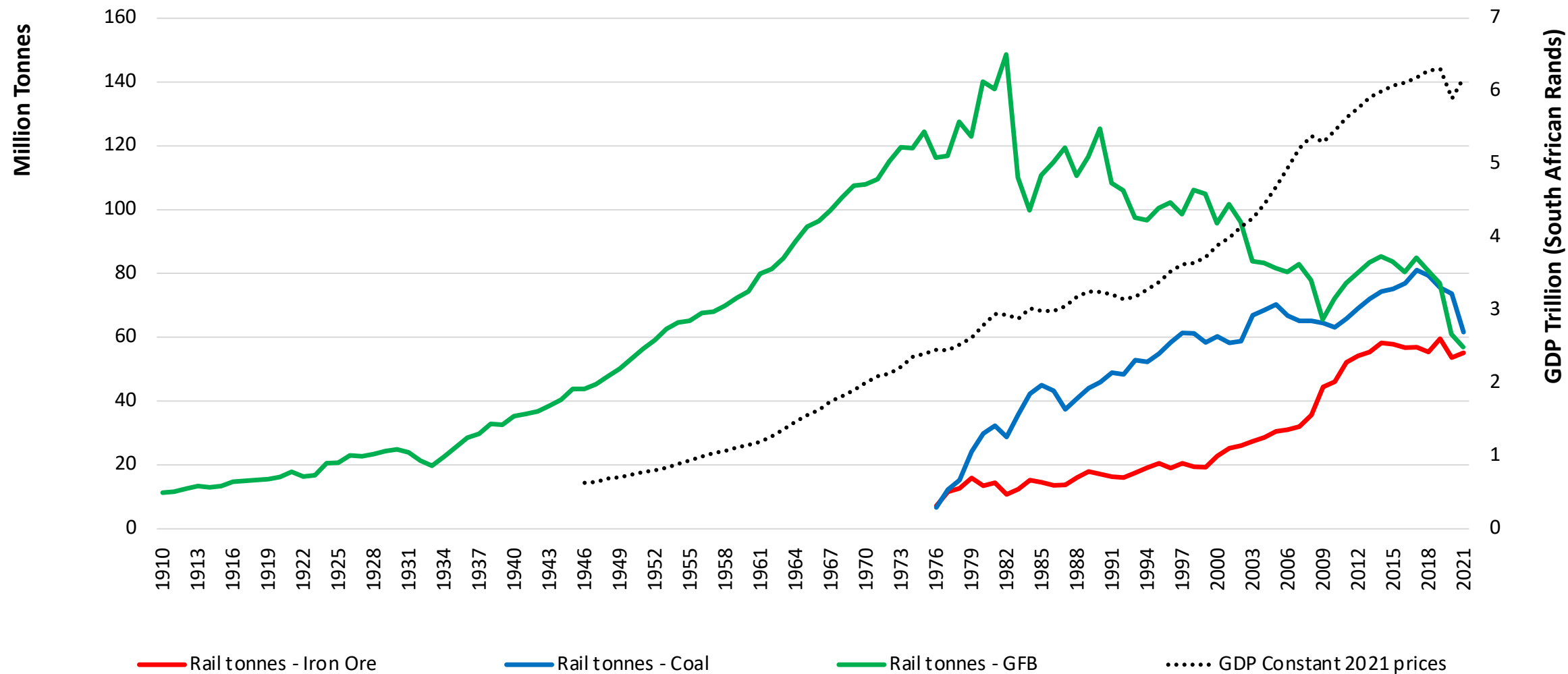
- **Spatial:** Shorter transport distances, consolidation, focus

Government coordinated approach to address this is missing.

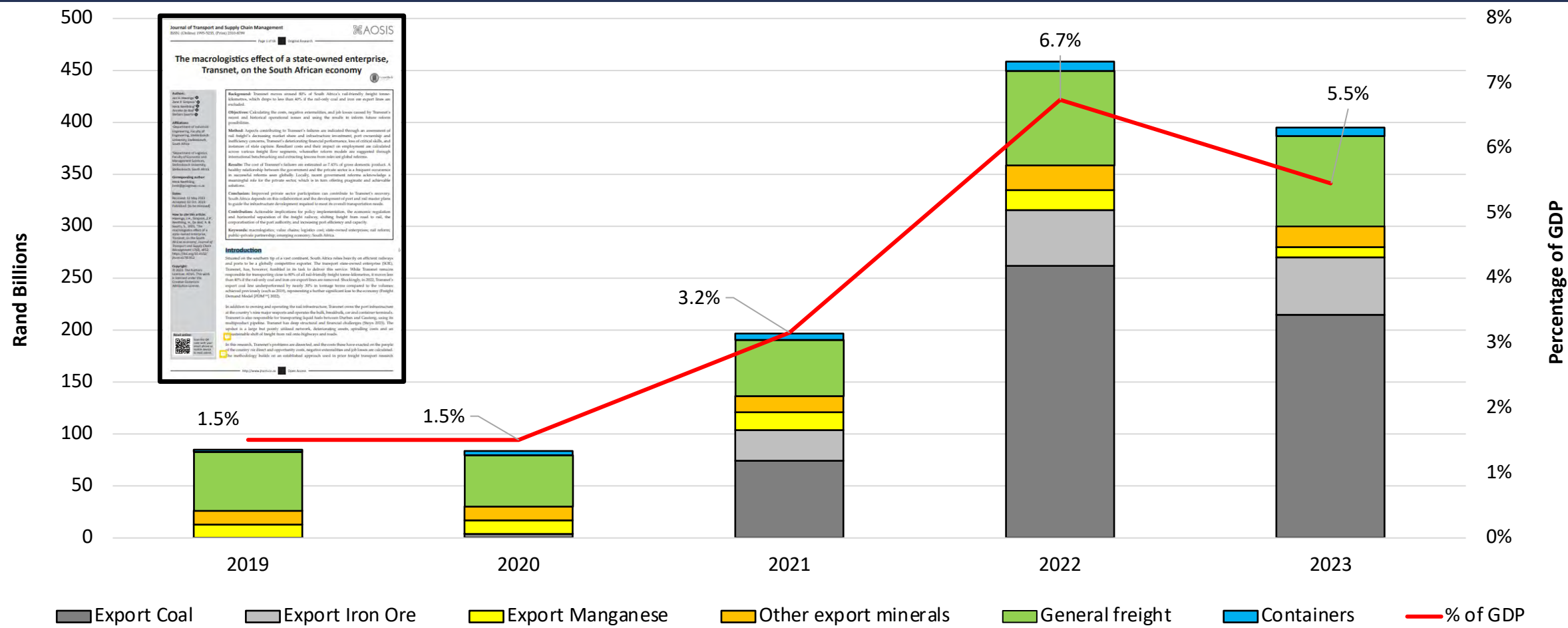
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Rail collapsed



And is damaging the economy

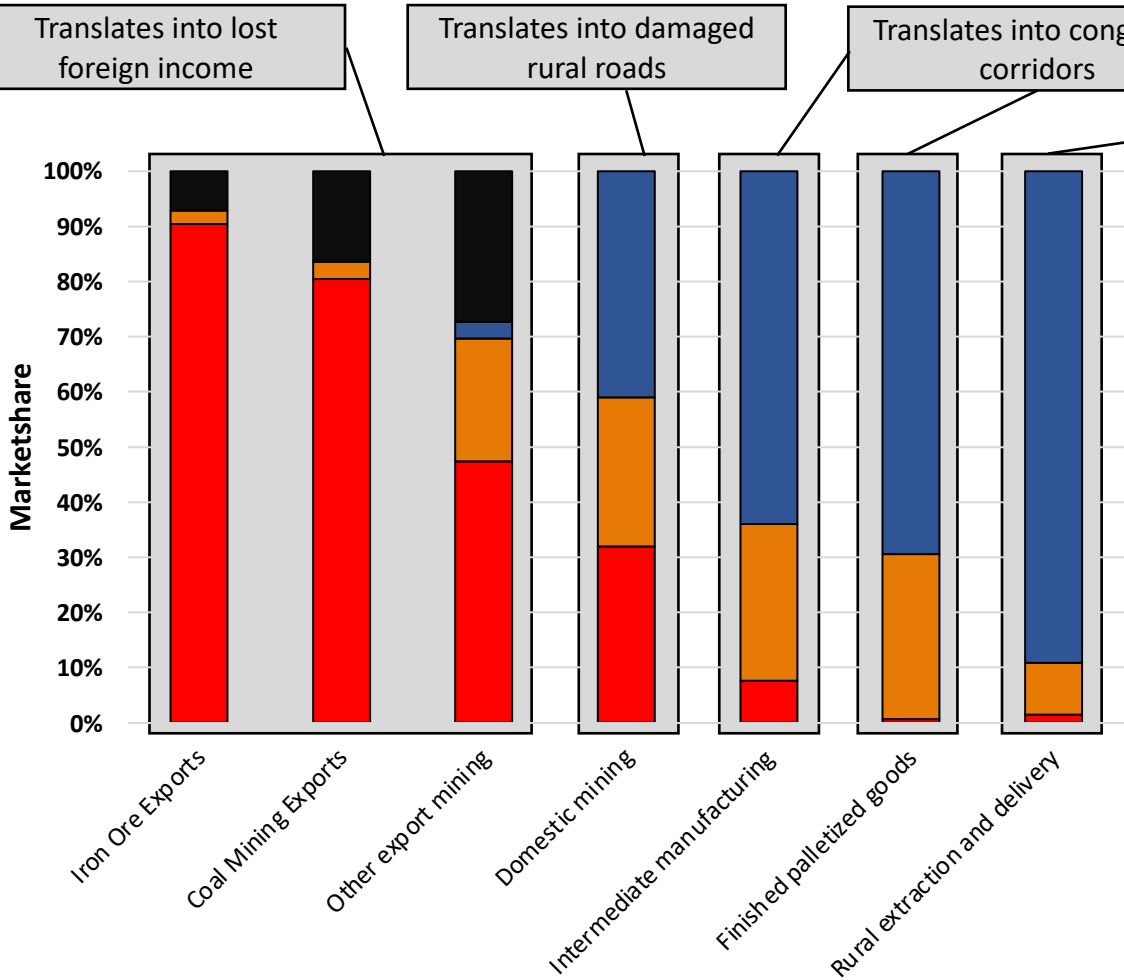


Source: GAIN Freight Demand Model™

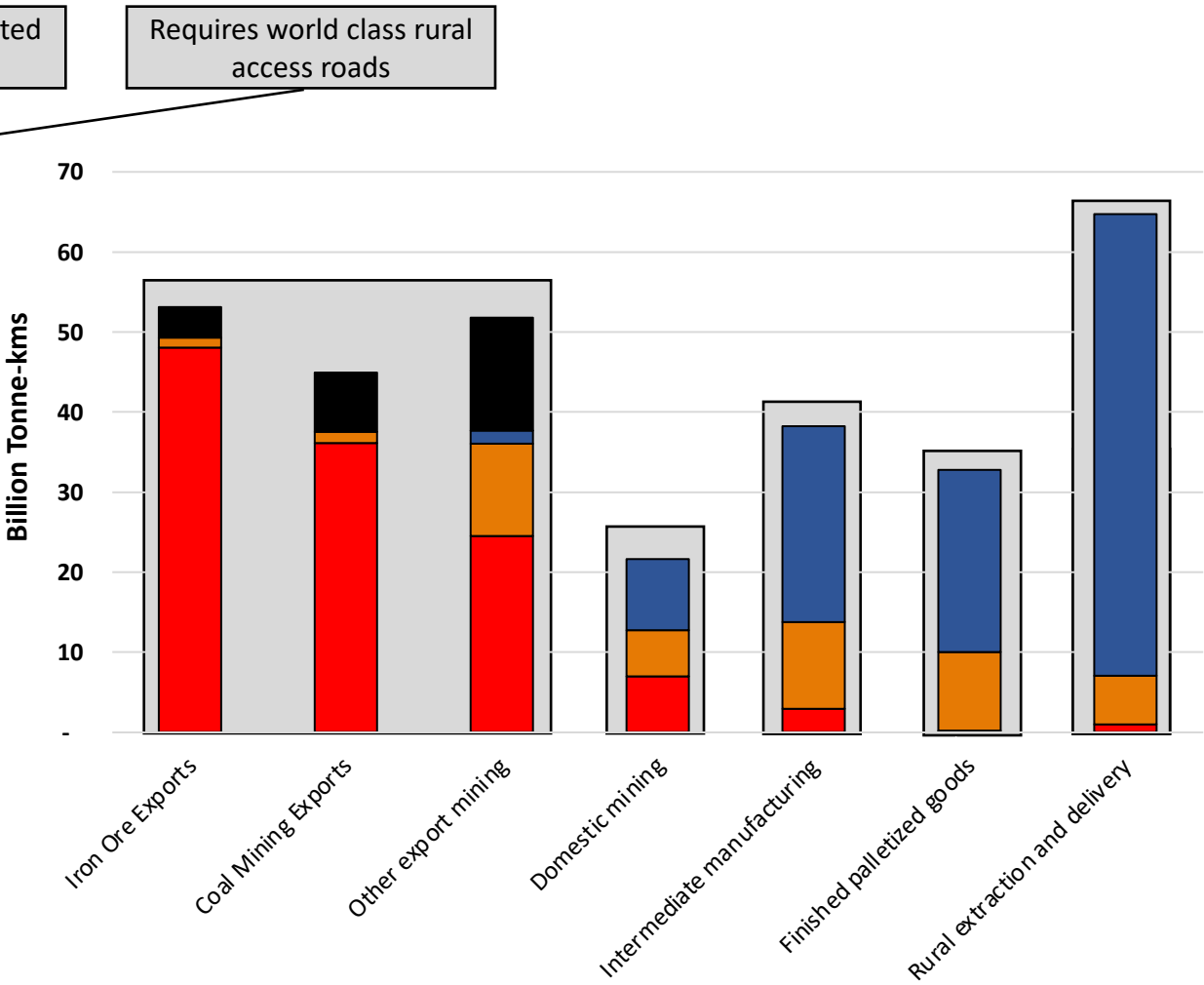
A national effort is underway to fix this -
Government stepped up in 2023, progress in 2024 stalled

The end goal is to mobilise rail correctly

Market share of rail %



Market share of rail tonne-kilometres

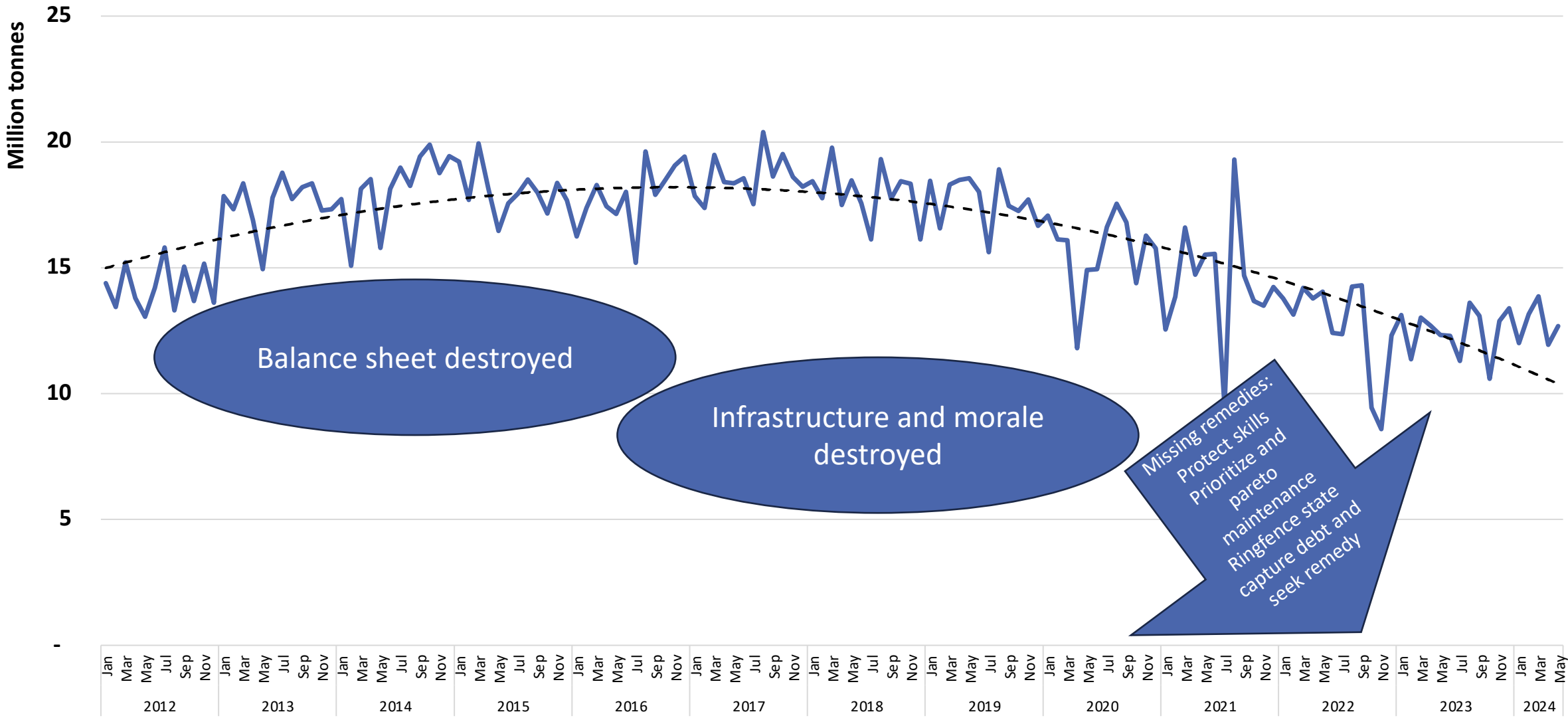


In 2023 we approached a Logistics Blackout, but it was a good year for reform

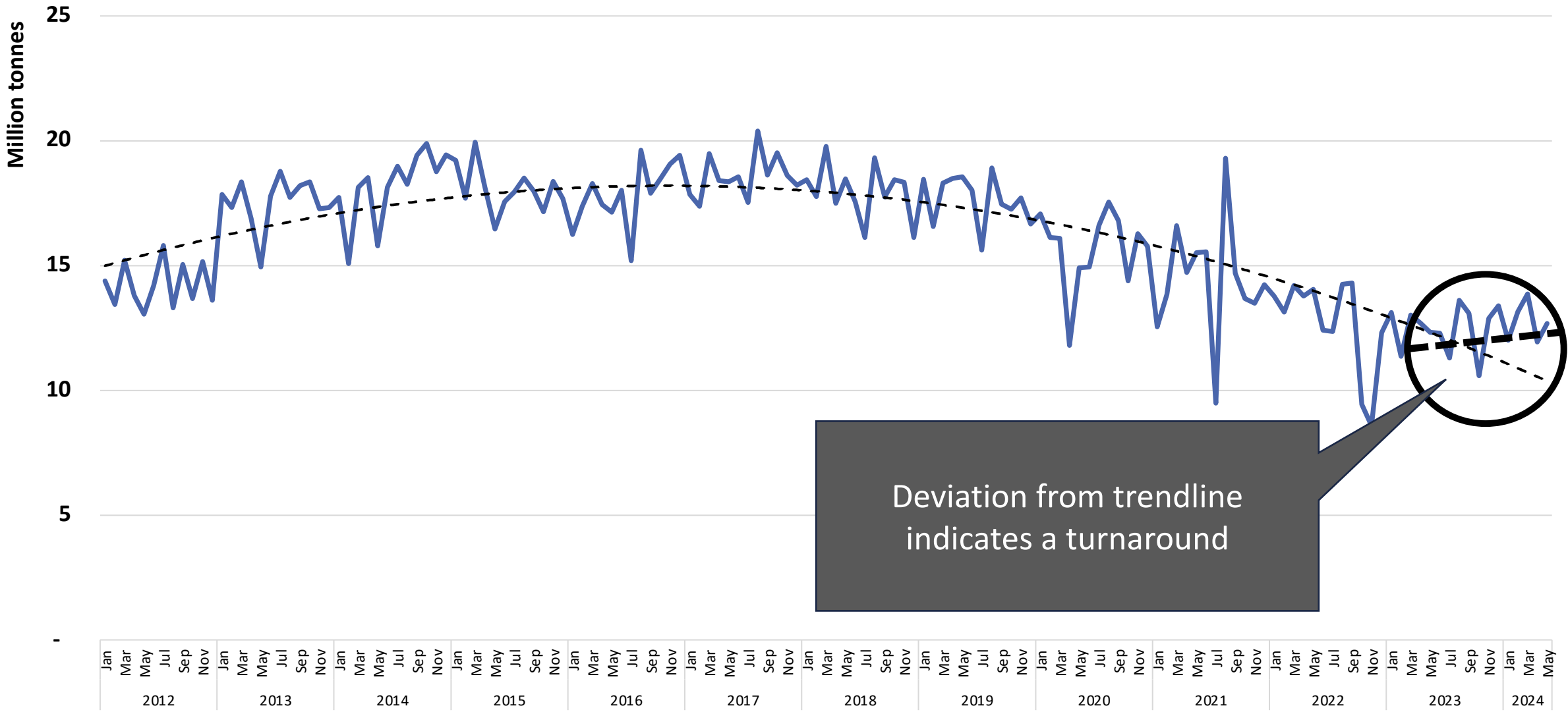
- 1. Roadmap announced in SONA in February**
- 2. National Logistics Crisis Committee (NLCC) created in June 2023**
- 3. New Transnet Board in July**
- 4. Major stumbling blocks (previous management) removed in September 2023**
- 5. The Freight Logistics Roadmap (FLR) through cabinet, 8 December, 2023**
- 6. NLCC Action Labs are beginning to show success**
- 7. The new Transnet leadership team is doing well**
- 8. There is a general feel of openness and engagement between business, Transnet, the Treasury and other government departments**
- 9. There is a turnaround plan, but short term focused and not completely aligned with the FLR**

But we're not effectively attending to the long term solutions yet

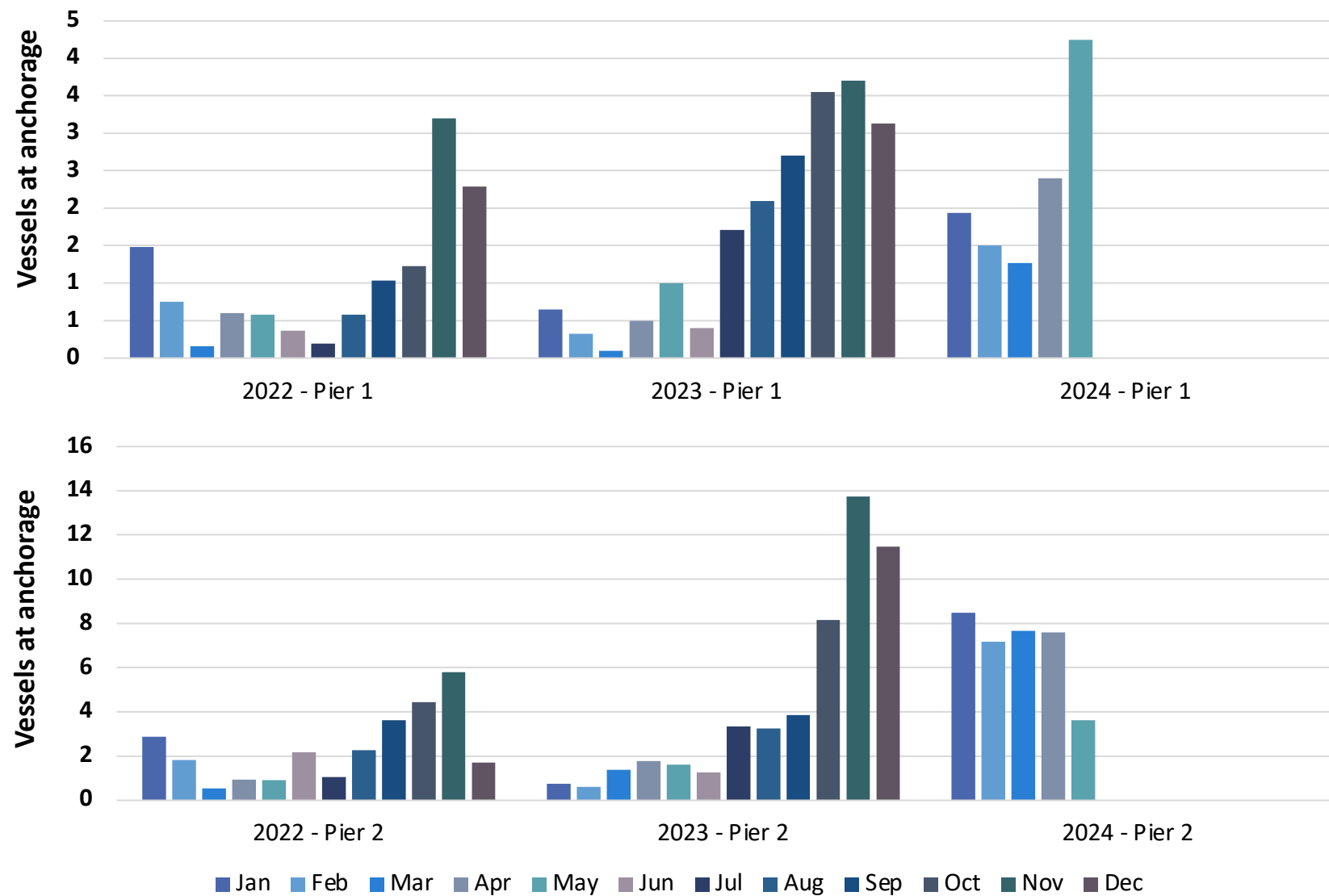
Historical monthly total TFR volumes



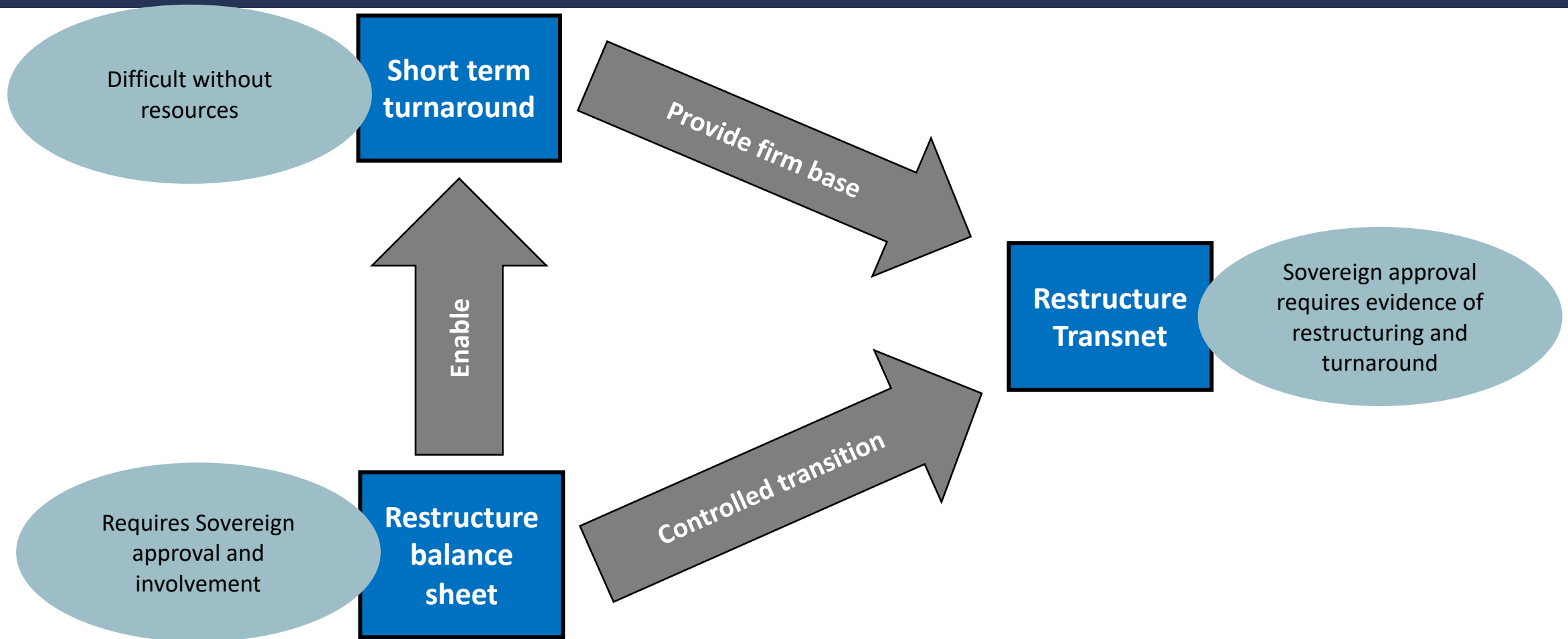
Historical monthly total TFR volumes



Vessels at anchorage – daily average – improving, but slowly



Three pillars of reform

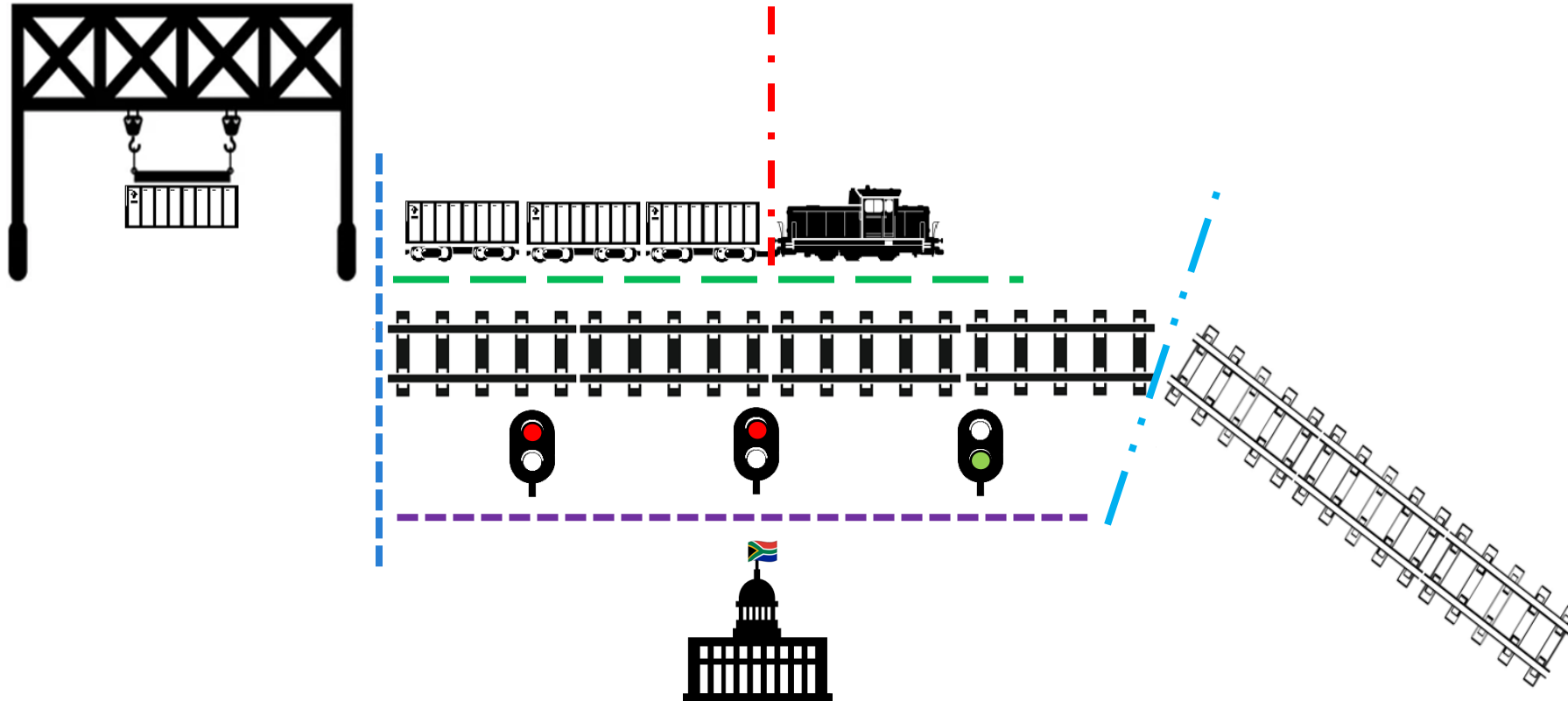


The most important enablers will be a believable financial model, rail masterplan and effective regulation

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What emerged is the promise of separation



Vertical separation between track and operations



Horizontal separation between low – and high-density lines



Horizontal separation between terminals and operating slots



Horizontal separation between locomotives and wagon fleets



Organisational separation between infrastructure operation and owner

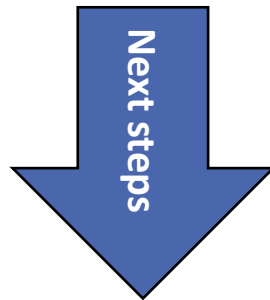
Source: Adapted Havenga, de Bod, Simpson, Swarts & Witthöft (2021:33)

Discussion

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- **South Africa's logistics problem**
- **The position and performance of Transnet**
- **Reform**
- **The future?**

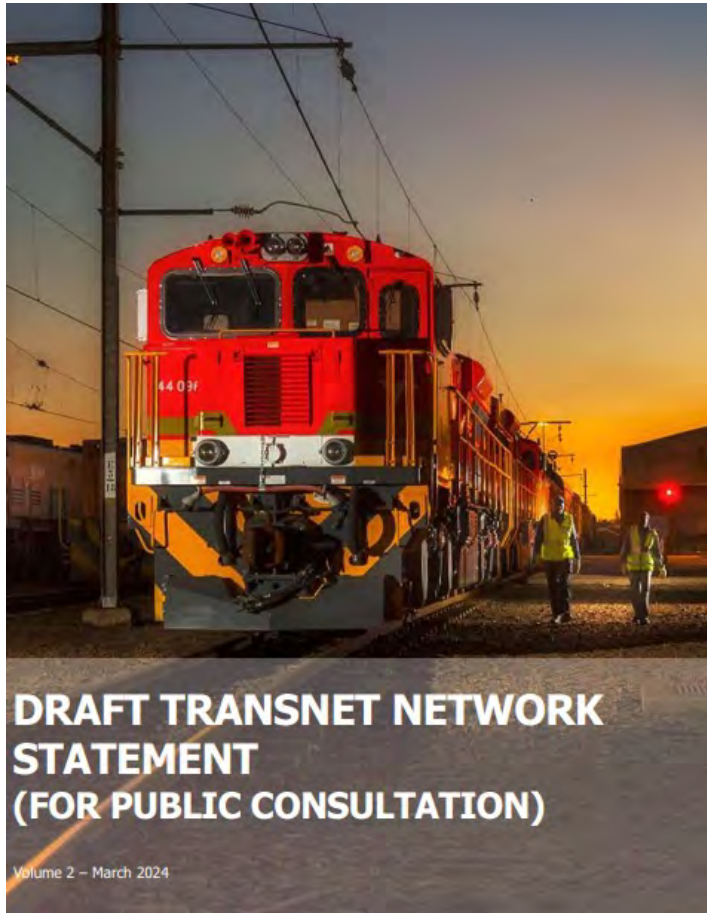
Enablers required

1. Disaggregated financial model rolled into a multisectoral logistics model for South Africa
2. Rehabilitate the network
3. Regulatory capacity



4. Organize the transition better (Treasury, Presidency, DPE, DoT, NLCC)
5. Develop a proper implementation plan

This week a network statement were published – a pivotal moment



- The tariff is too high
- This is great new management that is forced to sell a broken system for more than what is worth in a perfect condition
- Caused by:
 - State capture
 - Destroyed infrastructure
 - Bloated organization

The ensuing discussions will be interesting

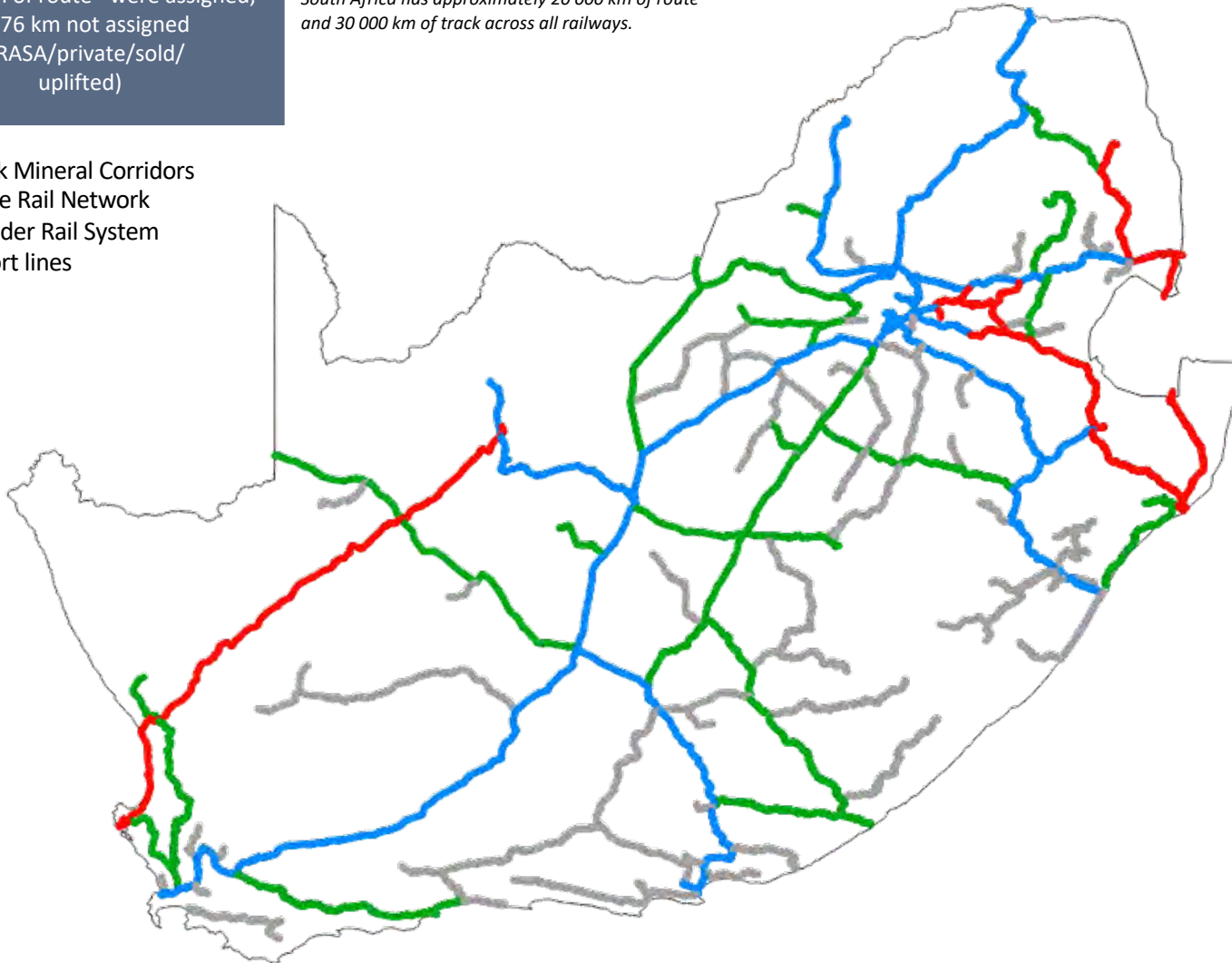
Right-sizing the rail network

18 907 km of route* were assigned,
1 876 km not assigned
(PRASA/private/sold/
uplifted)

** Route and track is often confused.*

*South Africa has approximately 20 000 km of route
and 30 000 km of track across all railways.*

- Bulk Mineral Corridors
- Core Rail Network
- Feeder Rail System
- Short lines



Bulk mineral corridors (2 241 km)

Heavy haul “conveyor belts” to bulk ports
Limited intermodal competition
Requires high density and homogeneity

Core rail network (4 818 km)

Major economic connections (ports and metros)
Mostly high-density or strategic connection role
Diverse commodities and segments
Critical in road-to-rail effort
Important role in supply chains

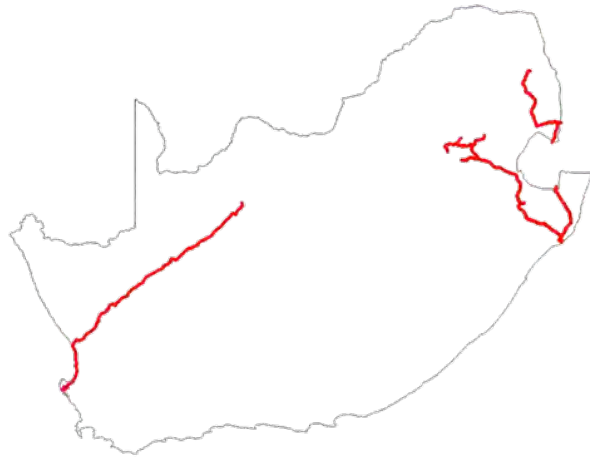
Feeder network (5 316 km)

Functionally and technological different
Important support for the core
Strategic role
Can sometimes replace the core in emergencies

Short lines (6 532 km)

Low volume potential
Could have important social or industry value
Minimum approach is ROW protection
Fair and equitable dispensation should be sought

Deconstructed rail network view – GAP?



Bulk mineral corridors (2 241 km)

Heavy haul “conveyor belts” to bulk ports
Limited intermodal competition
Requires high density and homogeneity

R30bn → \$1.5-2bn



Core rail network (4 818 km)

Major economic connections (ports and metros)
Mostly high-density or strategic connection role
Diverse commodities and segments
Critical in road-to-rail effort
Important role in supply chains

R80bn → \$4-5bn



Feeder network (5 316 km)

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Important support for the core
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Can sometimes replace the core in emergencies

R60bn → R\$3-4bn



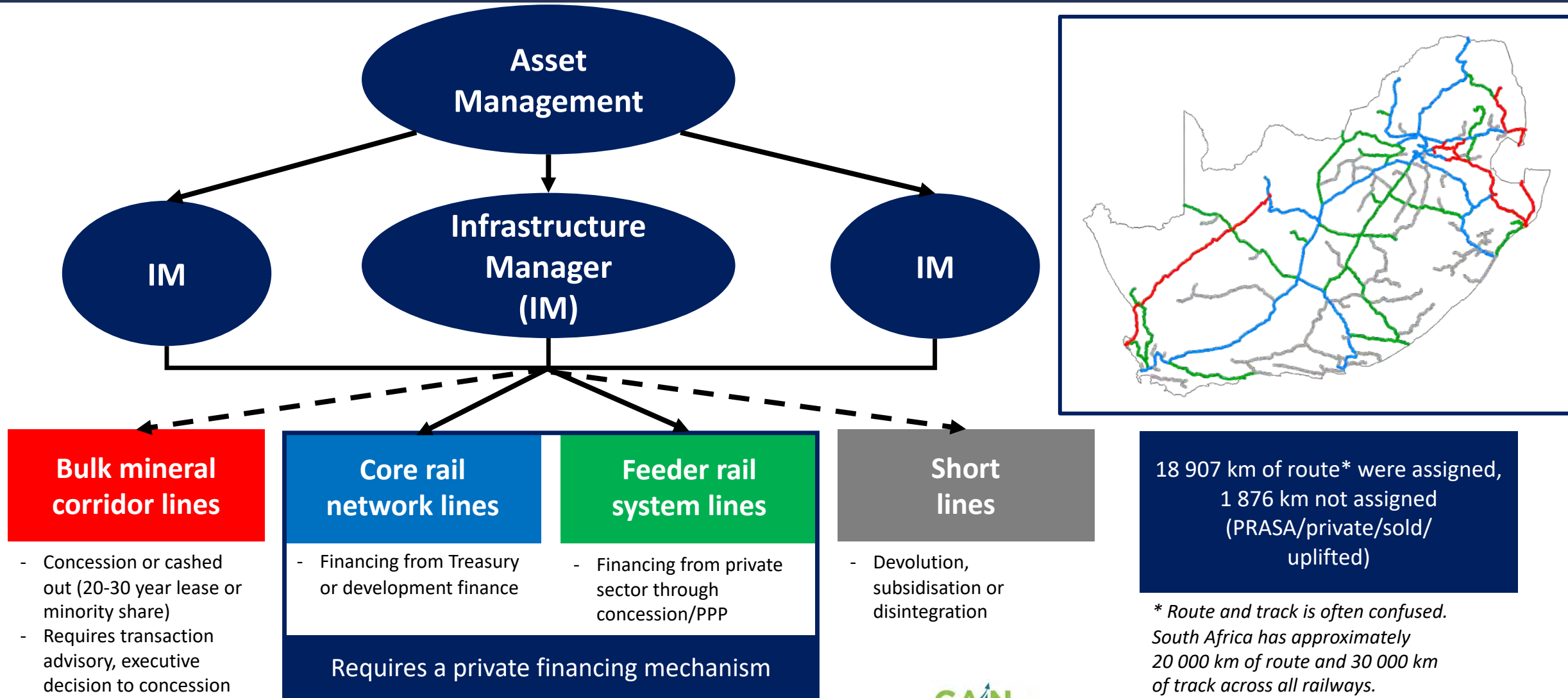
Short lines (6 532 km)

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R20 bn \$1bn

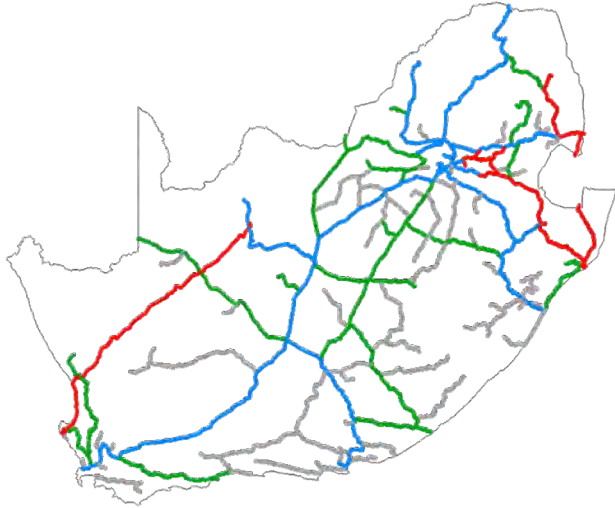
The maintenance shortfall might be approaching R200 bn or \$10 billion.

Infrastructure interventions



Our view of change – the rail network

ALL RAIL LINES



**Rehabilitation price tag: R190 billion
(this is a guestimate)**

Bulk mineral corridors:	R30 billion
Core rail network:	R80 billion
Feeder rail system:	R60 billion
Short rail lines:	R20 billion

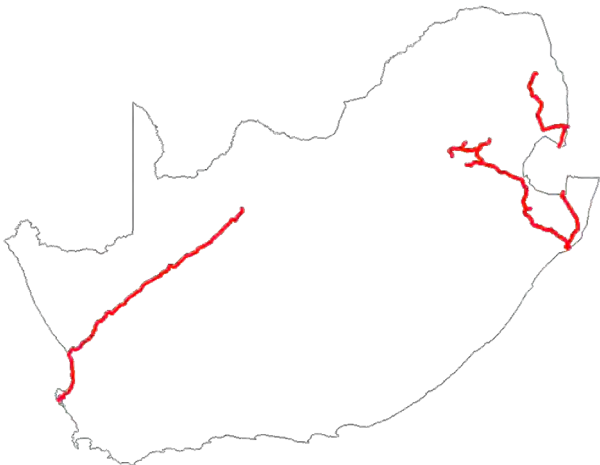


www.gaingroup.co.za

Source:

Harris (1977) curve adaptation based on historic rail data captured in the GAIN Freight Demand Model™

Bulk mineral corridors



Core rail network



Feeder rail system

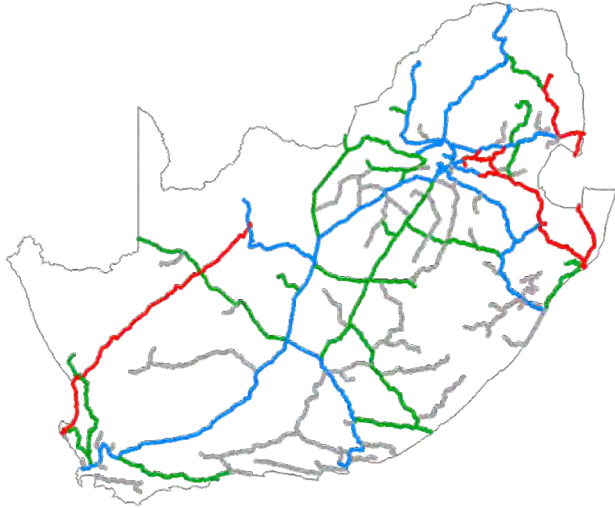


Short rail lines



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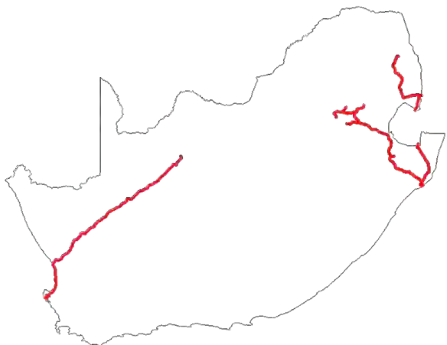


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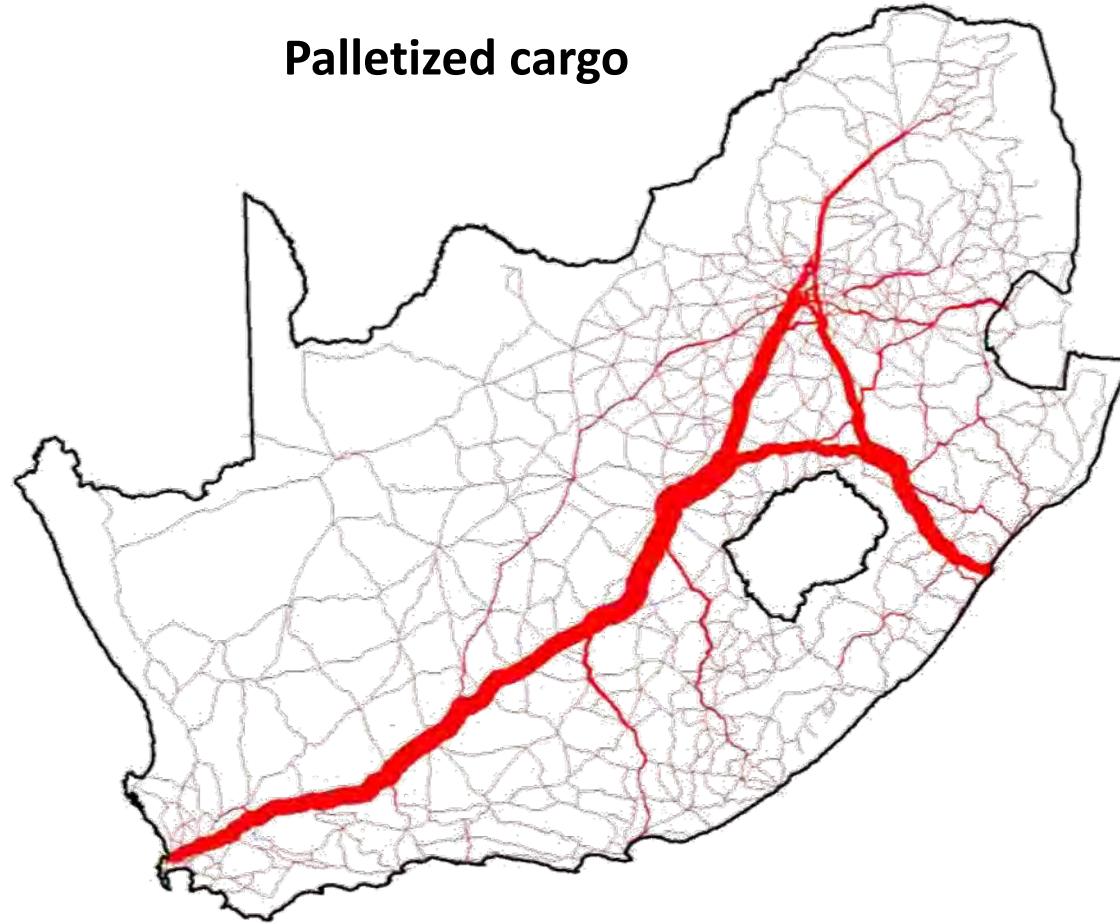


Short rail lines

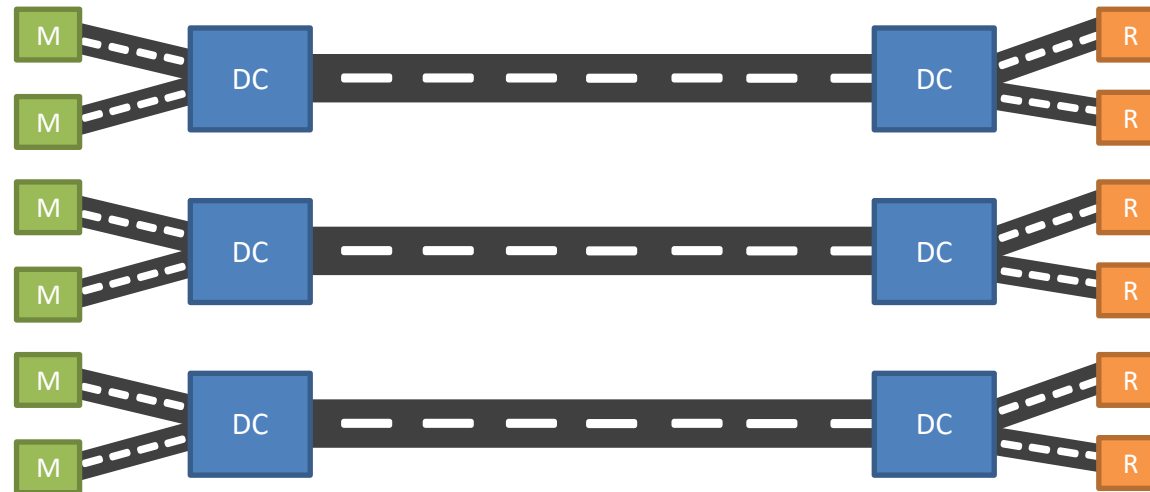


An example for our approach is the “missing railway”- for processed foods

Palletized cargo

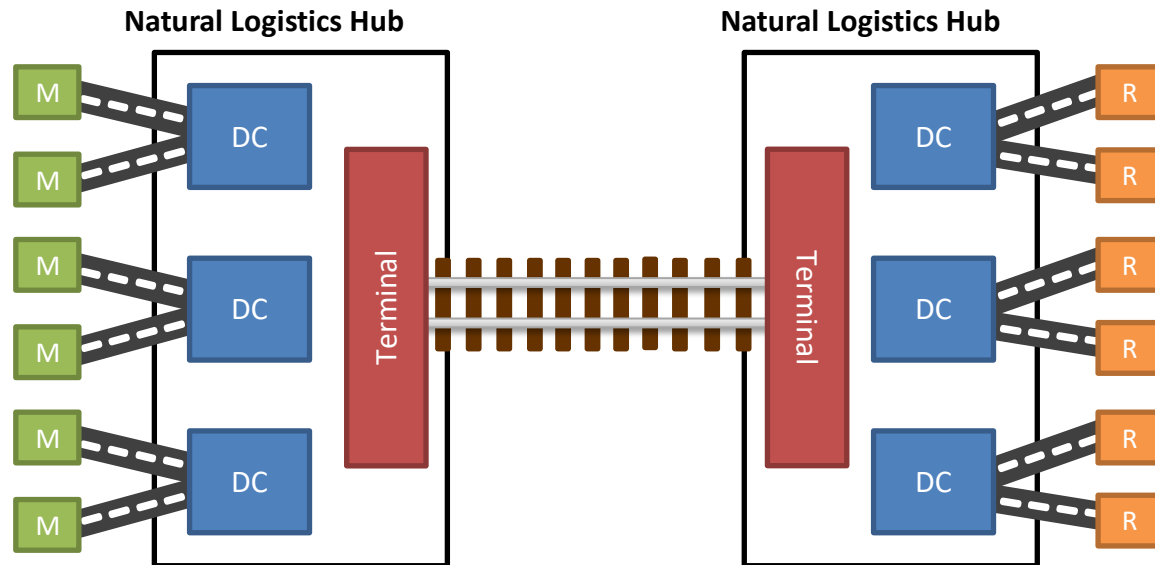


The typical FMCG long-distance supply chain requires domestic intermodal

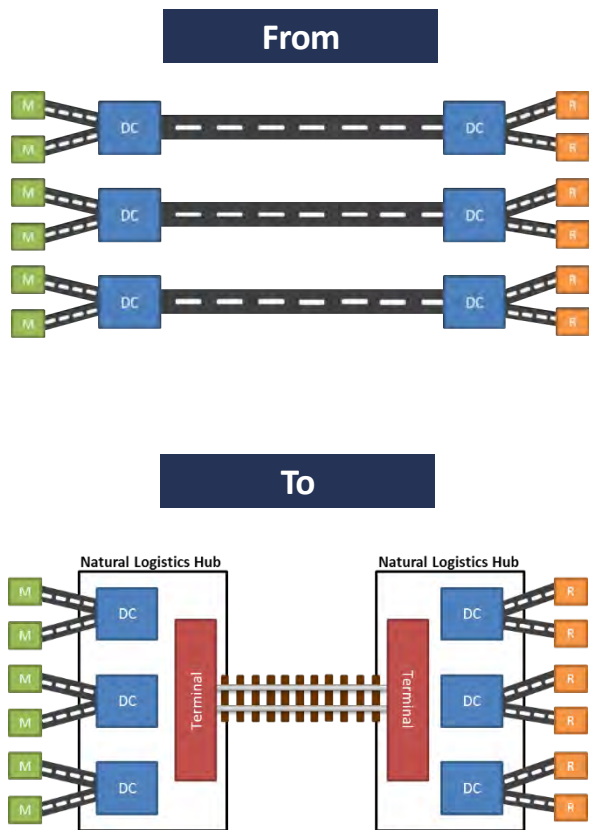


M = Manufacturing
DC = Distribution Centre
R = Retailer

Leading to the most important opportunity for the economy and the railway



Illustrating massive truck demand if natural rail doesn't follow – N3 corridor truck volume scenario with cost and carbon emission savings

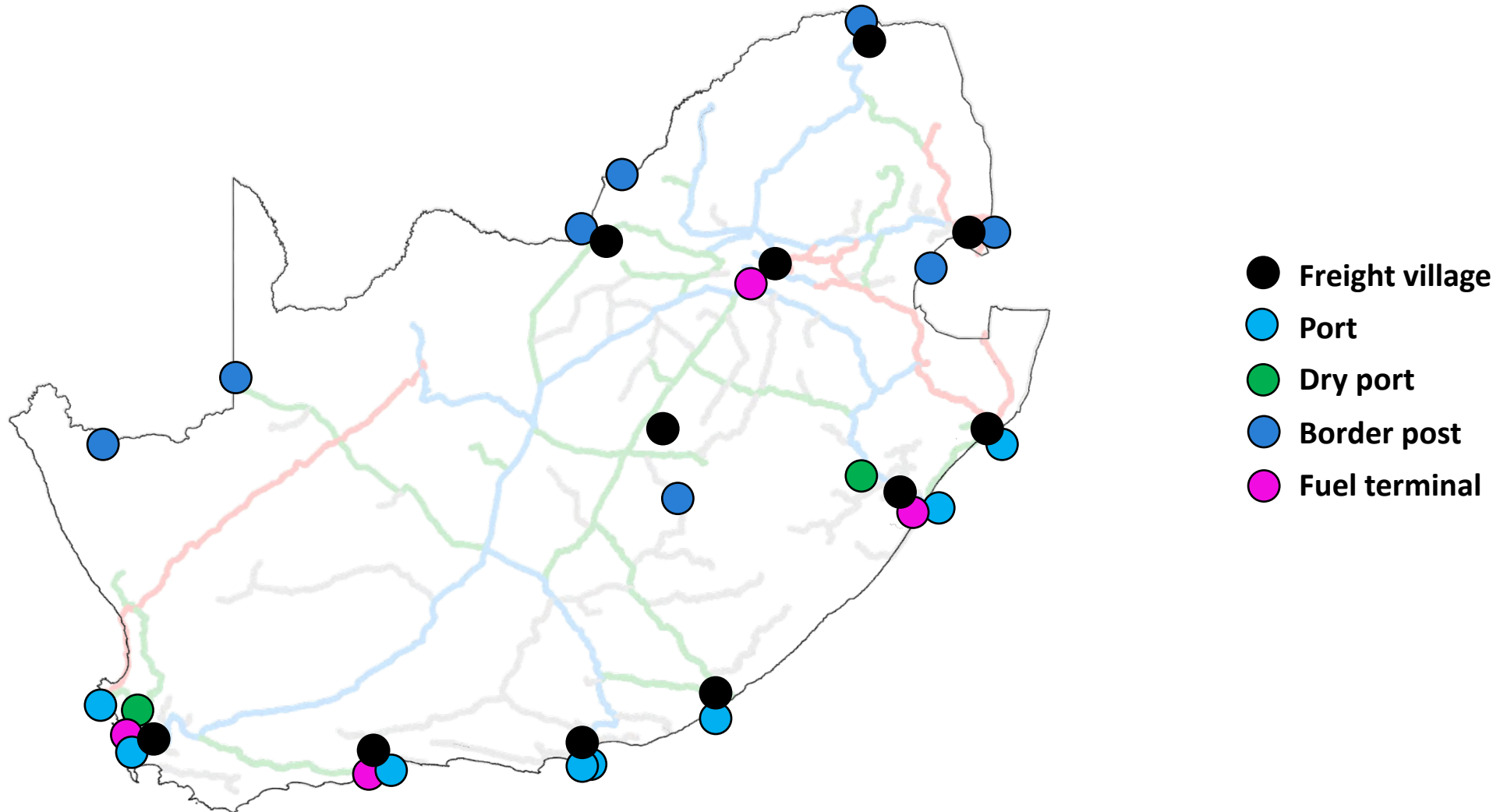


		Volumes and Savings		
Volumes		South Africa	Corridors	2 corridors only
	Tonnes (million)	50	30	20
	Tonne-km (billions)	30	16	13

2050

Road trips per day (laden)

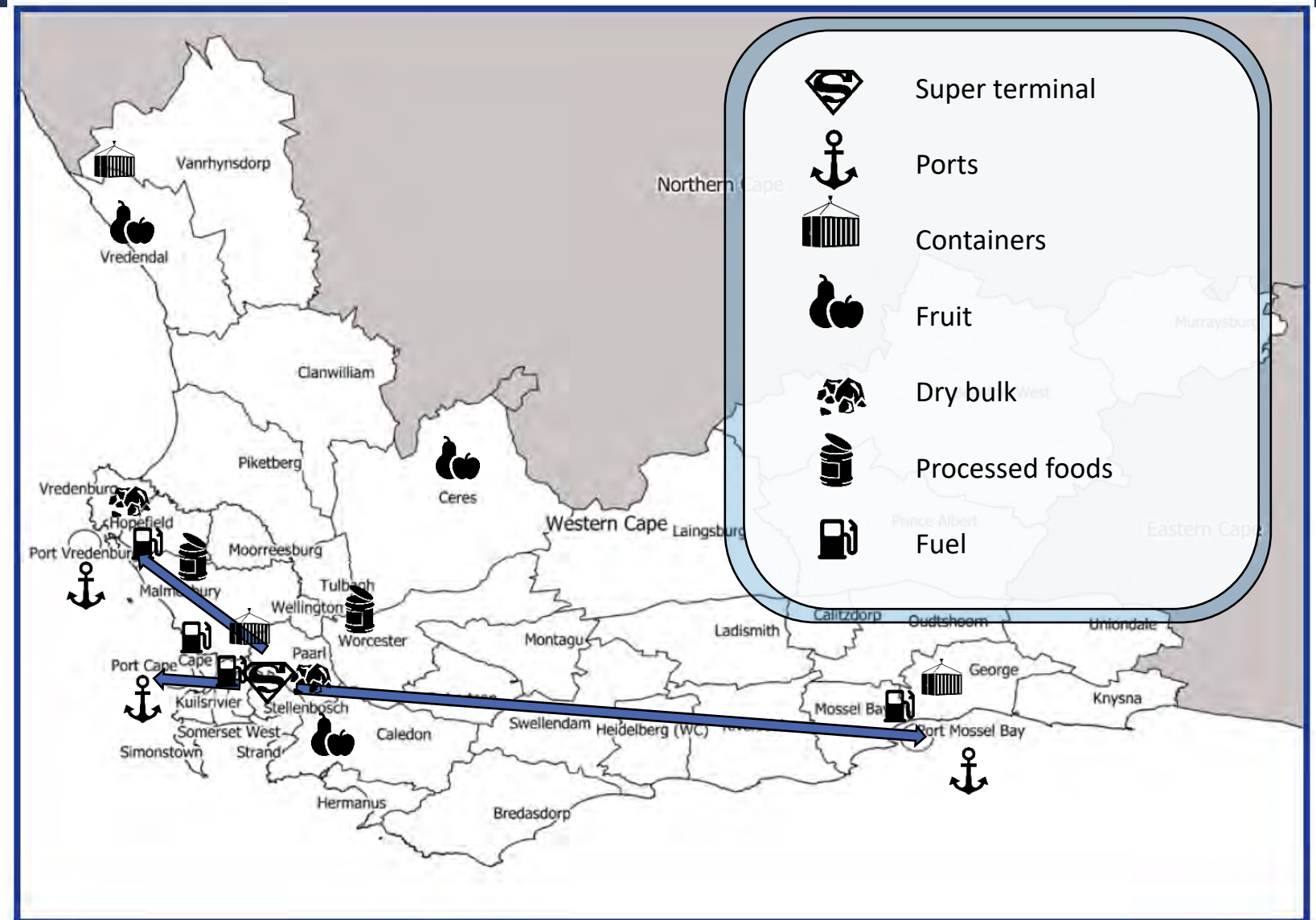
Spatial planning in South Africa is absent – the logistics hubs we should have



Source: Adapted Havenga, de Bod, Simpson, Swarts & Witthöft (2021)

Terminal network example – plan for WC province

1. Connect modes
2. Integrate flows
3. Internally connected
4. Product specific – one Super terminal
 1. Range for fruit
 2. Range for containers
 3. Range for dry bulk
 4. Range for processed foods
 5. Range for fuel



Source: Based on data in the WC FDM™, adapted from WC Freight Demand Model Report 2022

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

- 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

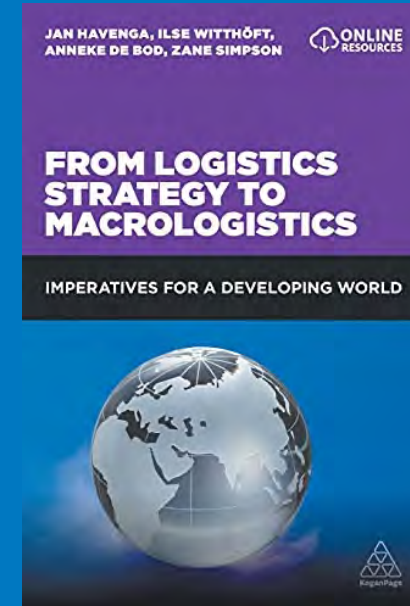
A failed railway will be a nail in the coffin of a failed state.



Prof Jan Havenga

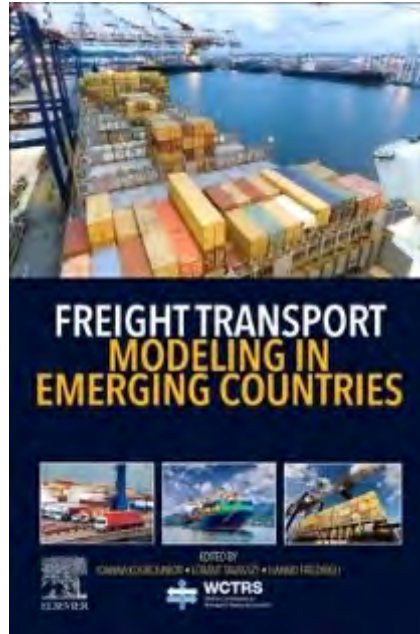
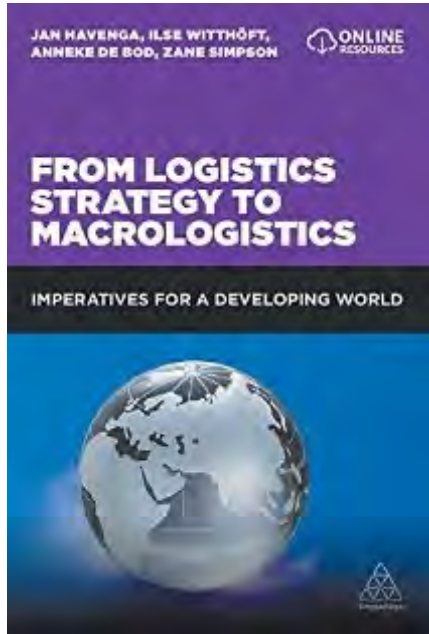
Director at GAIN Group (Pty) Ltd

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Books available at:

1. <https://www.koganpage.com/logistics-supplychain-operations/from-logistics-strategy-to-macrologistics-9781789664010>
2. <https://www.sciencedirect.com/book/9780128212684/freight-transport-modeling-in-emerging-countries>



37 peer reviewed articles

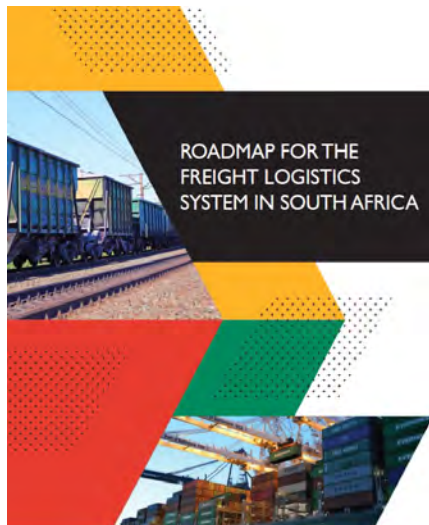
60 international peer review conference papers

20 invited/key note presentations on all continents

2 books, 2 chapters in peer reviewed books

Books available at:

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Various reports
(latest 1st road to rail strategy for RSA and Transnet's effect on economy)

Direct recommendations from the best in this field.
Including "father" of Freight Flow modeling as well as the co-creator of the WB LPI

Road to rail report available at:

<https://sa-tied.wider.unu.edu/article/proposed-freight-and-passenger-road-rail-strategy-south-africa>