Southern African Citrus **Rail Status** 2011

Citrus Growers' Association
OF SOUTHERN AFRICA

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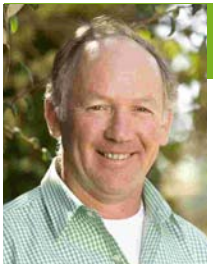
Contents



Foreword by **CEO**

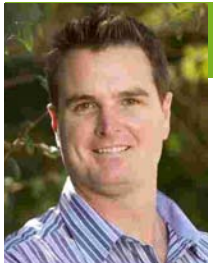
Justin Chadwick
Chief Executive Officer

Annually some 750 000 pallets of citrus are transported from citrus growing regions to the East Coast port of Durban. The bulk of this fruit is transported by road – a reverse of the situation some twenty years ago when most fruit was railed to the port.

South Africa's road infrastructure has reached breaking-point; some of the national roads used to transport citrus have been reduced from tar to dirt. Added to this is the huge delay experienced by transporters as they experience congestion in the Durban port environment. Transporters faced with these challenges as well as the volatile fuel costs have ramped up transport rates. Unfortunately these cost increases to the South African citrus grower cannot be passed on to the consumer, as most international citrus markets are under pressure, and prices have at the best remained static (and at the worst declined by up to 50%). Given this cost price squeeze, many citrus farms some distance from the port are no longer sustainable.

Railing containers COULD be the solution. Rail should be able to provide a service that is reliable (not dependent on road conditions, road congestion, accidents etc.), cost effective and efficient. At present most growers are frustrated at the inability of rail to live up to these expectations.

What is needed is a true public-private-partnership. Any one party alone cannot make the dream of a slick, efficient, cost effective rail service come true; all parties working together in tandem can make it happen.



Introduction by **Logistics Development Manager**

Mitchell Brooke
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I first joined the citrus industry in the late 1990s appointed in the operations department of the then Outspan International, based at the Durban Export Terminal (DET).

I remember the significant volume of rail wagons that were routed from the inland production points back in those days, in total I would estimated more than 80% of citrus was transported to port by rail. In fact, back then rail was received by port export terminals in Cape Town, Port Elizabeth, Durban and Maputo for citrus to be loaded on Specialized Reefer Ships. Prior to the deregulation of the citrus industry in 1998, there was only Outspan International that represented the citrus grower base and 90% of citrus was exported by Specialized Reefer Ships from dedicated citrus terminals. This made railing citrus to ports much more favourable and simpler than the current status quo. Over the last 10 years there has been a significant increase in the volume of citrus exported from Southern Africa which has grown from roughly 60 million cartons to 96 million cartons in 2010. From 2005 there has been a progressive decrease in the volume of rail utilized to transport citrus to ports and by 2010 citrus was only transported to Durban and Maputo but in very small quantities and mainly from the Limpopo region. Coupled with the increase in citrus export volume and a decrease of rail utilization, the demands on the road transport sector has resulted in frequent bottlenecking of road trucks in port during peak season. To mitigate the extreme overutilization of road and port cold storage infrastructure, rail development is paramount to providing a seamless and tactical means of moving citrus through the port networks.

There are many challenges facing the conventional rail enterprise but there are niche areas where this transport mode can play a role in transporting citrus to ports. The biggest challenges are the lack of port rail infrastructure at new loading facilities, the development of packing high cube pallets at production point (one or two additional layers on a conventional height pallet) which at present rail equipment cannot suitably load, long rail transit times to port, rail vs road pricing variances and the severity of fragmentation of the citrus supply chain; which is steadily moving from an Exporter conglomerate base to grower based exporters packing in-house brands. The future of citrus rail transportation lies strongly with the railing of Integral Reefer Containers packed at source or at inland hub facilities. This not only offers a seamless and cost effective means of transporting citrus but offers best cold chain and product integrity solutions through the supply chain.

Map of **Southern African Citrus Production** and **Export Ports**

ZIMBABWE
Weipe
Louis Trichart
Tshipise
Letsitele
Limpopo Province
Hoedspruit
BOTSWANA
Marble Hall - Groblersdal
Hazyview
Nelspruit
Karino
Malelane
Gauteng
North West
North Swaziland
Maputo Port
Mpumalanga
SWAZILAND
South Swaziland
Free State
Northern Cape
Vaalharts
Pongola
KwaZulu-Natal
Orange River
Nkwalini
LESOTHO
KZN Midlands
Ixopo
Durban Port
SOUTH AFRICA
Eastern Cape
Fort Beaufort
Citrusdal
Sundays River
Boland
Western Cape
Patensie
Port Elizabeth (Coega)
Cape Town Port

Graph of **Regional Volume of Production** and **Transport Distance to Export Ports = Pallet Kilometres**

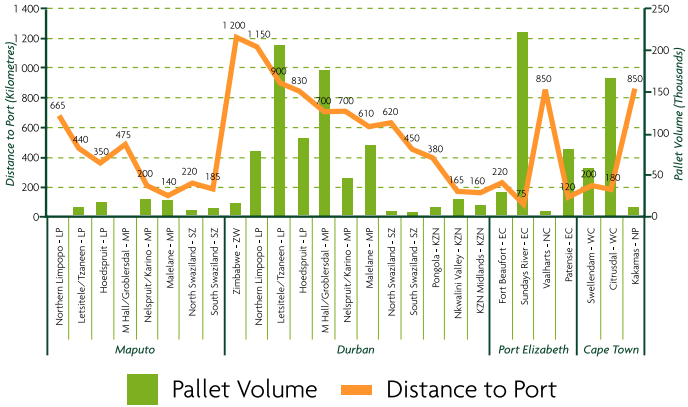
Rail transportation requires high volumes of homogeneous types of cargo to be railed in block units over great distances to be a viable and feasible transport solution. Over short to medium distances, road transportation in South Africa has obtained a competitive edge over rail transportation due to the cost and logistical efficiencies achieved by road transportation.

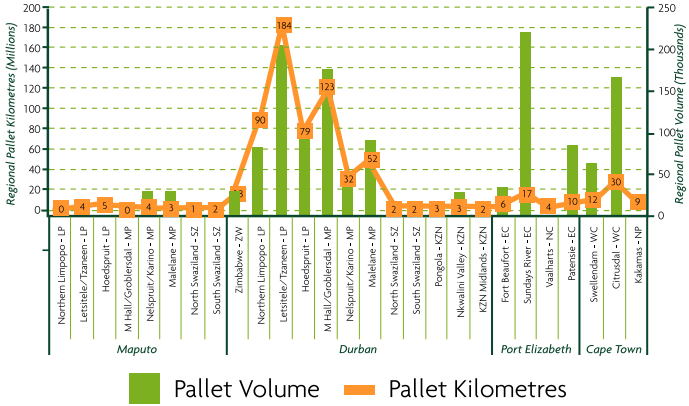
When assessing the citrus production and export transport demographics, it remains evident that citrus produced in the north eastern regions of Southern Africa namely; Mpumalanga, Limpopo and Zimbabwe is deemed to be a rail viable region. Transport distances in this citrus region exceed 600km's to the Durban port and exceed 300km's to the Maputo port.

Calculating the production volume x transport distance, the pallet kilometres can be calculated. Based on this data it can be identified which specific regions have the potential to consolidate citrus to transport by Conventional and/or Reefer Container rail modes.

1. **Letsitele = 184million pallet kilometres to Durban.**
2. **Groblersdal = 123million pallet kilometres to Durban.**
3. **Northern Limpopo and Zimbabwe = 108million pallet kilometres to Durban.**
4. **Hoedspruit = 79million pallet kilometres to Durban.**

Note: Although minimal export volumes are routed from Letsitele and Hoedspruit to Maputo, these areas can be considered rail viable to transport citrus by rail to Maputo.





Overview of **Citrus Conventional Break-bulk Rail Operations** and **Developments**

Historically the conventional practice of railing citrus from production areas to port cold store facilities has been utilized extensively. Prior to the adoption by the industry to load citrus in containers, citrus was railed to port terminals and then loaded on break-bulk type Specialized Reefer ships and exported globally. The conventional 'O' type wagon was primarily used for this purpose where citrus was road trucked from production points to a local siding and then transferred to rail wagons. There existed a few production points that were equipped with rail infrastructure linked directly to the packhouse where citrus could be loaded directly and railed to ports. These wagons were then accumulated into block wagon loads at specific rail yards and then transported as bulk loads to the ports. Until the mid 1990's the South African government legislated the transportation of goods by rail with permits required for the use of road transportation under condition. With the abolition of this legislation, road transportation began to erode the services of general freight rail transportation by way of pricing and efficiency. Where once 80% of citrus was transported by the conventional mode, currently less than 3% of citrus is transported to ports this way. Containerisation and the fragmentation of the supply chain arena post deregulation has made it difficult to use the conventional break-bulk rail mode.

The loading of containerization to export citrus to global markets represents 75% of volume shipped, and 85% of product packed is now packed as high cube pallets (one or two additional layers of cartons above a standard height pallet) at production point. This mitigates the use of the conventional break-bulk rail mode using the 'O' Type wagon which is limited to loading 24 standard height pallets. Transnet Freight Rail (TFR) converted 6m general purpose high cube containers aimed at transporting citrus high cube pallets to ports. The containers were adapted to fit bath type container wagons, resulting in a protrusion on the inside of the container limiting the ability to load 12 high cube pallets. At present only 10 high cube pallets per container with 2 x 6m containers per wagon can be loaded.

There still exists a niche requirement for this method of rail transportation. 1) Citrus exports to the Russian market are still shipped by way of Specialised Reefer vessels and all product is packed as standard height pallets. 2) Consolidation of product packed within citrus regions targeted for specific rail viable port cold stores. 3) Block trains targeted from Letsitele and Hoedspruit to Maputo for the Europe break-bulk service.

South Africa is well placed to be the leaders of intermodal refrigerated container transport development, somehow the road-rail debate within the fruit arena continues with diminutive progress. Citrus regions located in closer proximity to ports have the advantage of collecting empty containers from port and road haul to the farm to load and deliver directly to the port container terminals for shipping globally. In fact, 80% of citrus produced in the Eastern and Western Cape regions pack citrus directly into containers at the farm or at inland cold stores. At present this is not the case for citrus produced in the north eastern regions. 95% of citrus from this region is road hauled on trucks to Durban port cold store facilities to be stored and then stuff the product into containers. These are then re-transported by road to the Durban container terminal. The development of the Integral Reefer Container places the citrus industry at a huge advantage by offering reduced shipping costs, reduced landside logistics costs, better cold chain and offers better product integrity by loading containers inland at the production source. The north eastern regions have an added advantage by utilizing rail infrastructure to transport empty containers upstream and redeliver directly to container terminals back downstream – bypassing hugely congested road networks nationally and in ports.

The dominant but hugely under-utilized container rail operations are set to continue from the Letsitele citrus region – currently facilitated via the Tzaneen station. This operation needs to be moved to Letsitele to reduce 40km of road travel. More operations are being introduced such as the Groblersdal region loading containers on farm and trucking and railing containers from Pretoria (Pretcon sidings). There are further developments in the pipeline to operate additional container rail services via Polokwane in Limpopo and Nelspruit in Mpumalanga. Polokwane is an operative accumulation point for Limpopo and Zimbabwe regions to despatch reefer containers to farms as well as offering an intermodal freight hub for citrus to be transported by road and cross-docked into containers for delivery to ports.

The limitation of direct farm loading of containers is the ability for a single packhouse to consolidate a container load of citrus to meet market requirements. Larger packhouse operations produce quantities that overcome this which permits on farm container loading, but to accelerate the reefer container rail operations to its full potential, common-user consolidation and cross-docking facilities are deemed necessary. Letsitele and Polokwane are earmarked for this infrastructure to place the Limpopo and Zimbabwe regions at the forefront of reefer container intermodal operations – giving the region where 40% of Southern African citrus is produced a globally competitive edge.

Reefer Container Delivery Timeline and **Precooling Temperature** Timeline Comparison

1 Citrus Container Stuffed ex Port Facility

Description: citrus product packed at a packhouse and then transported by road or rail to a port cold store facility or ambient facility where the product is consolidated, stored and stuffed into a container for export. The empty container is collected ex Durban depot then transported by road to the stuffing facility and then transported by road from the stuffing facility to a port container terminal and delivered to vessel stacks. This process creates an overutilization of port cold storage infrastructure and increases the opportunity for product damage due to high levels of handling during storage. Over-utilization of road transportation creates bottlenecking in port - can be overcome by utilizing rail.

Container Delivery Timeline: during peak season, the road transporting of citrus may take up to two days for delivery to a port cold store facility in Durban. Once citrus is received it is quite common that citrus will remain in storage for a period of 7 – 10 days (average dwell time) prior to being stuffed into a container. The average process timeline may take less than or equal to 12 Days from packing.

Precooling Temperature Timeline: from the time citrus is packed and transported from packhouse to receipt in port, the average timeline is recorded at 3 days. A cold store facility commonly adopts static air flow for precooling citrus, the timeline of precooling citrus from ambient to achieving a pulp temperature of 4.5°C has been recorded at less than or equal to 4 days. The average precooling timeline can be determined to be less than or equal to 8 Days from packing.

2 Citrus Container Stuffed ex Inland Hub Facility

Description: citrus product packed at a packhouse and then transported by road to an inland stuffing facility (hub) where the product is consolidated, stored and stuffed into a container for export. The empty container is collected ex Port depot and transported by road to a port rail siding facility where the container lots are transferred to rail and are transported by rail to an inland rail siding facility (hub). The containers are transferred to road and transported to the inland stuffing facility and returned to the rail siding on completion of stuffing the containers with citrus. The containers are stored (under power) and transferred back to rail when the container lots are transported by rail directly to a port container terminal rail siding and transferred to vessel stacks.

Container Delivery Timeline: road transporting of citrus from a packhouse to an inland hub facility should not exceed a same day delivery. The inland hub facility concept proposes that the facilities are located with 250km radius of citrus production points. Citrus stored in ambient conditions should not exceed a storage period of 4 days prior to being stuffed into a container and railed to port. The average transit time for a container railed from an inland siding should not exceed 3 days. Therefore the average process timeline should take less than or equal to 7 Days from packing.

Precooling Temperature Timeline: citrus should be packed and transported to an inland stuffing facility the same day. Citrus should be stuffed within 4 days from ambient storage. Research has shown that a container stuffed with citrus can achieve an average pulp temperature of 4.5°C within 3 days of applying constant electricity to the containers cooling unit. The average precooling timeline can be determined to be less than or equal to 7 Days from packing.

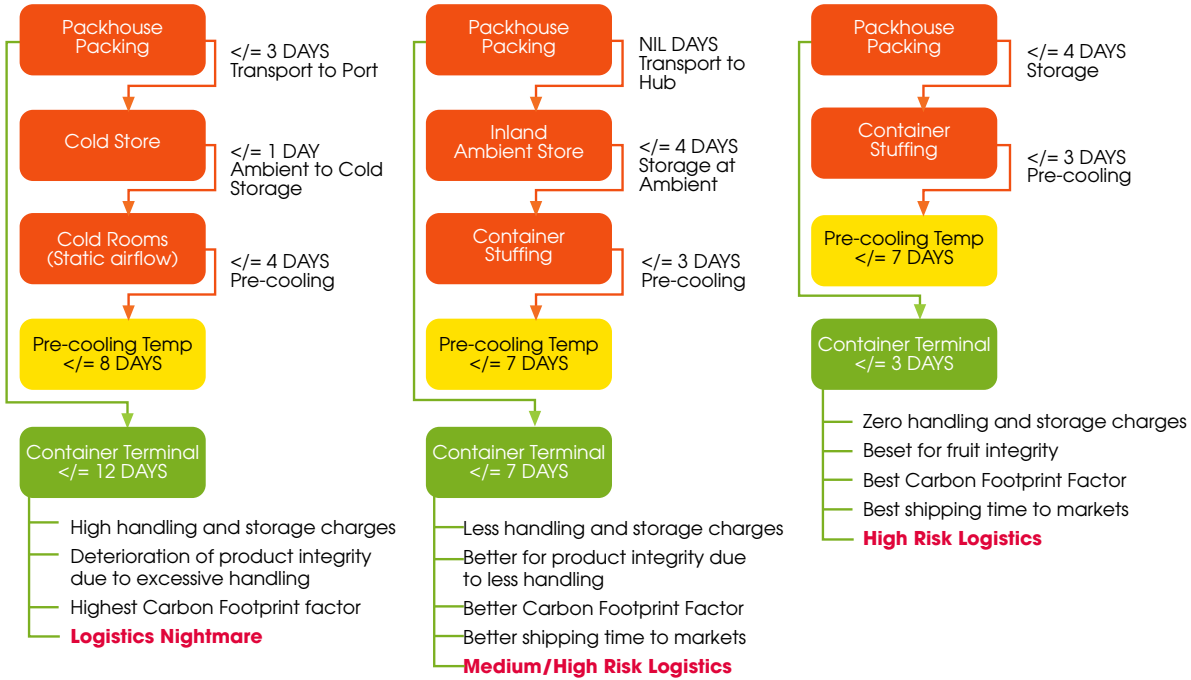
3 Citrus Container Stuffed ex Packhouse

Description: citrus product packed at a packhouse and then product is consolidated at the packhouse and stored either ambient or pre-cooled (where cold stores exist) and then stuffed into a container for export. The empty container is collected ex Port depot and transported by road to a port rail siding facility where the container lots are transferred to rail and are transported by rail to an inland rail siding facility. The containers are transferred to road and transported to the packhouse and returned to the rail siding on completion of stuffing the containers with citrus. The containers are stored (under power) and transferred back to rail when the container lots are transported by rail directly to a port container terminal rail siding and transferred to vessel stacks.

Container Delivery Timeline: citrus that is packed and targeting for ambient packhouse container stuffing should not exceed a storage period of 4 days prior to being stuffed into a container and railed to port. The average transit time for a container railed from an inland siding should not exceed 3 days. Therefore the average process timeline should take less than or equal to 3 Days from packing.

Precooling Temperature Timeline: citrus should be packed and stuffed within 4 days from ambient storage. Research has shown that a container stuffed with citrus can achieve an average pulp temperature of 4.5°C within 3 days of applying constant electricity to the containers cooling unit. The average precooling timeline can be determined to be less than or equal to 7 Days from packing.

Reefer Container Delivery Timeline and **Precooling Temperature Timeline** Comparison Process Flow Model

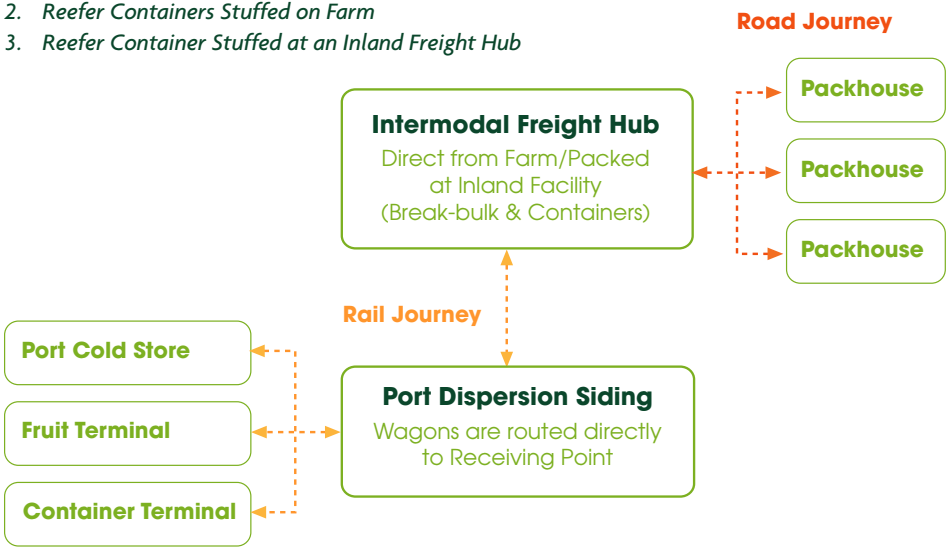


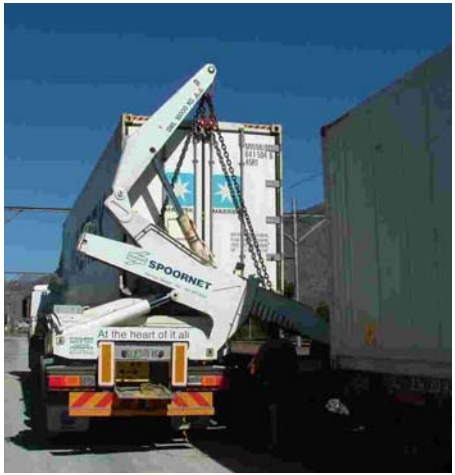
Note: *This assumption is based on research from letsitele to Durban average recording during peak season.*

The Intermodal Transportation Concept Flow Model

3 Mode Approach

1. *Conventional Ambient Break-bulk*
2. *Reefer Containers Stuffed on Farm*
3. *Reefer Container Stuffed at an Inland Freight Hub*





Definition

Intermodal freight transport involves the transportation of freight in an intermodal container or vehicle, using multiple modes of transportation (rail and truck), without any handling of the freight itself when changing modes. The method reduces cargo handling, and so improves security, reduces damages and losses, and allows freight to be transported faster. Reduced cost and increased efficiency is achieved by utilising this method of transportation.

Conventional Break-bulk Rail Operations

Strengths

- Seamless means of transporting citrus to port.
- Rail receives priority at port facilities.
- Offers better product transport integrity to reduce damages.
- Offers a reliable means of transport to producers.
- Overloading not a factor for rail transport.
- Rail functions optimally in block units.

Weaknesses

- Transit times to ports.
- Rail vs. Road pricing variation.
- Limited rail infrastructure in ports.
- Transnet relies on third party logistics providers to supply road and rail services to Transnet clients.
- Limited rail rolling stock for citrus transport – at present only 200 x 'O' Type wagons and 240 x 'Pallet Friendly' container wagons exist to load citrus.
- Requires block trains of 40 wagons routed point – point to be viable.

Opportunities

- Railing block trains of Russia packed fruit from Letsitele to FPT Durban.
- Railing block trains of high cube pallets from Limpopo to rail viable Cold Stores in Durban.
- Railing block trains of Europe, MED and Russia break-bulk packed fruit from Limpopo to Maputo.
- Citrus regions to formulate rail specific logistics providers - direct rail accounts with TFR and suitable loading equipment in place.
- Polokwane hub to consolidate citrus.

Threats

- Pilferage of product.
- No suitable wagon for transporting high cube pallets.
- Road haulage pricing flexibility.
- Electricity, steel and fuel price increases.
- Severe fragmentation of citrus logistics supply chain.
- Cable Theft.

Reefer Container Intermodal Rail Operations

Strengths

- Offers seamless means of transporting containers from inland to port container terminals.
- High level of cold chain and product integrity through the supply chain – Door to Door.
- Shortest transit time to markets.
- Best cost chain structure.

Weaknesses

- Stack date integrity influences direct container delivery at container terminals.
- Turnaround time of reefer trains from Durban Container Terminal.
- Direct farm loading of containers prohibited by market requiring container lots.
- Lack of consolidation facilities.

Opportunities

- Limpopo - Railing Reefer containers from Letsitele and Polokwane hub to Durban, Ngqura, Port Elizabeth or Cape Town container terminals.
- Mpumalanga - Railing Reefer containers from Pretoria (Pretcon) hub to Durban, Ngqura, Port Elizabeth or Cape Town container terminals.
- Ngqura - world class rail infrastructure and underutilized reefer capacity.

Threats

- Shipping Lines not allocating empty containers to meet the requirements.
- Lack of cooperation between Transnet Freight Rail and Transnet Port Terminals.
- Cable Theft.

MOU between **Limpopo Department of Roads and Transport (LDRT)** and **Transnet Freight Rail (TFR)**

From an official r elease: Late in July 2011, Transnet Freight Rail (TFR) CEO Siyabonga Gama and the Limpopo Depar tment of Roads and Transport (LDRT) MEC Pinky K ekana signed a memorandum of understanding (MOU) aimed at promoting an integrated rail freight logistics infrastructure system in the Limpopo Province.

"The aim is to form strategic partnerships with the province to create logistics and consolidation hubs for agricultural, mining products and other commodities to be railed from the province to other parts of the country and for the export markets. This will enable farmers and coal mining companies in the province to have the majority of their products transported through rail."

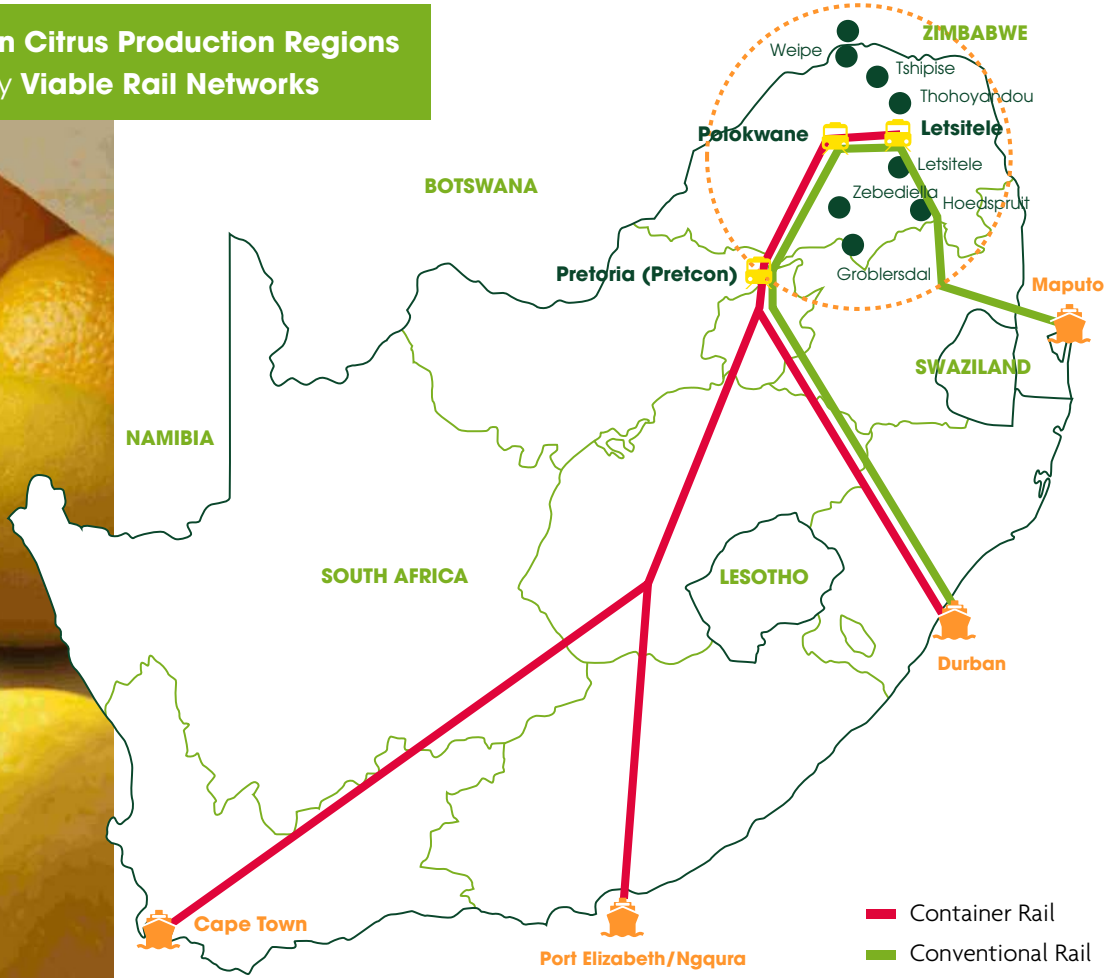
According to CEO Gama, feasibility studies will be conducted within the current financial year (to April 2012) to establish the technical and economic viability of the impr oved railway systems. "The feasibility studies will focus on, amongst others; the viability of r ail freight services between Tzaneen/Letsitele and Durban and/or Cape Town harbour; the viability of establishing a citrus hub with sorting, packing and cold storage facilities; and the establishment of a fresh produce market in Polokwane.

"This initiative is aligned with a number of others aimed not only a t improving the pr ovincial transport landscape but ha ve economic and socioeconomic impact in the province. It will also stimulate enterprise de velopment and employment gr owth b y ensuring tha t all established consolidation hubs are multi-user facilities, and use local labour. Employment is expected to be cr eated in the packing, c old storage, container management and container handling facilities. Since this initiative encourages intermodal transport, more jobs are to be created in the trucking and rail related industries", Gama says. Ms Kekana said the province is establishing a freight databank meant to serve as a platform for public-private collaboration. ***Ends***

Citrus rail operations in the Limpopo province are considered a priority b y the CGA. Rising transport costs and logistical c onstraints are impacting he avily on the pr ofitability and sustainability of citrus production in the region. There ar e many c onstraints that ha ve been indentified that ar e hindering the pr ogress towards revitalizing this method of tr ansport, with the signing of a MOU between these parties these issues will hopefully be addressed.

MEC for Limpopo Roads and Transport, Mme Pinky Kekana and CEO of Transnet Freight Rail, Mr Siyabonga Gama, sign a Memorandum of Understanding in Polokwane on 21 July 2011.

Map of **Southern African Citrus Production Regions** Linked to **Export Ports** by **Viable Rail Networks**



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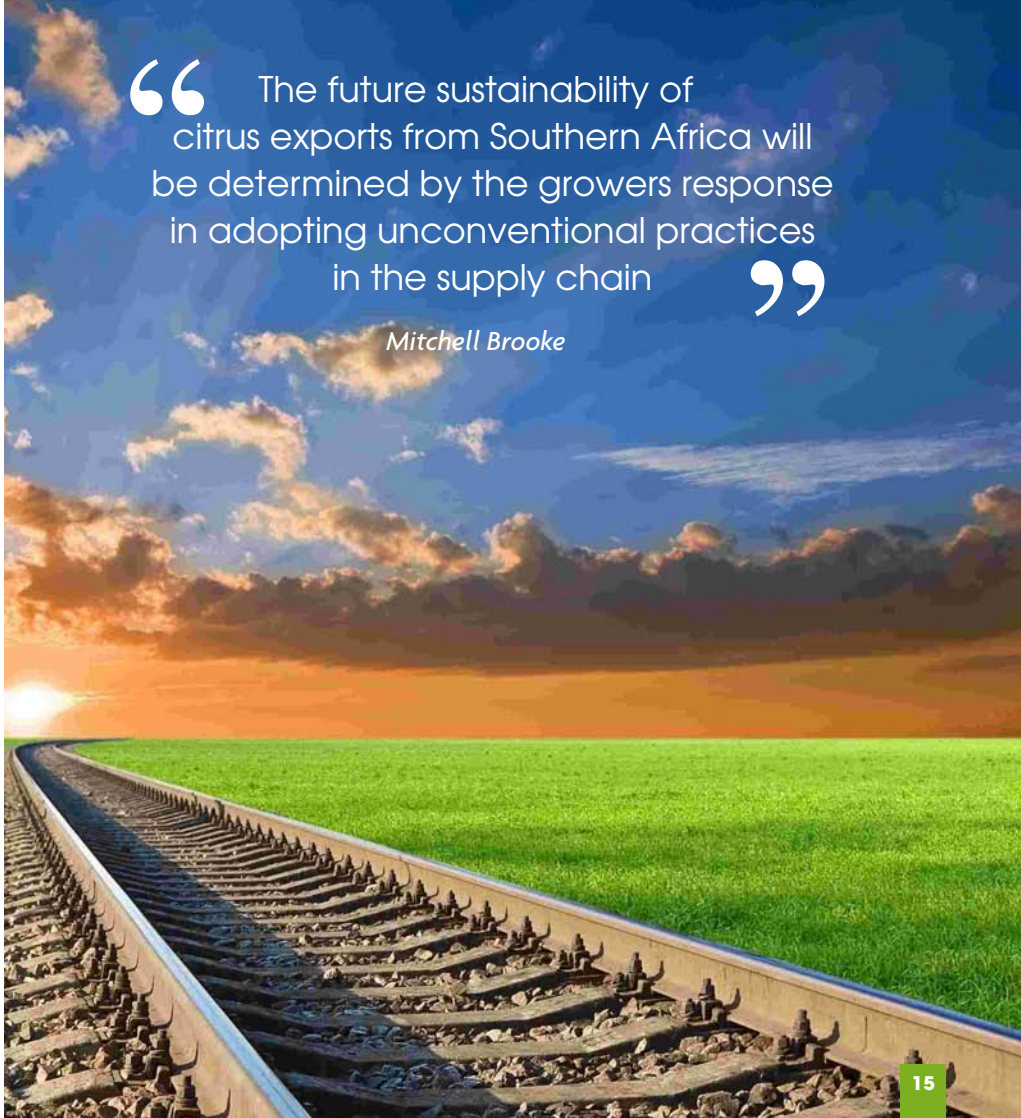

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