

# Logistics Gateways and Transportation Corridors a Formula for Success in Africa

- by Franco Eleuteri

## Intermodal rail as part of a new model creates a win-win solution for government and the private sector.

The rethinking of “legacy” rail functions provides the opportunity to provide cost effective transportation services.

In particular, intermodal rail can provide the backbone for a plan focused on economic development. This is of particular importance to Africa’s emerging economies, which seek to create jobs beyond their export of raw materials from the continent.

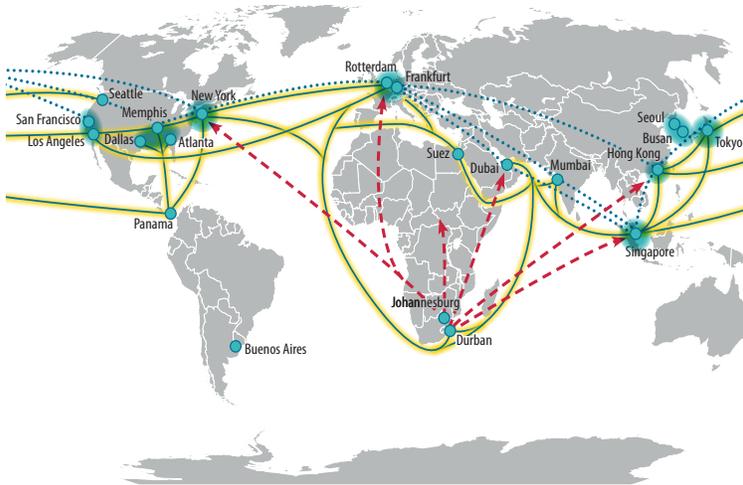
Competitive intermodal rail both requires the re-engineering of the traditional rail function and its integration into an overall transportation and manufacturing/distribution capability.

warehousing, and distribution of goods.

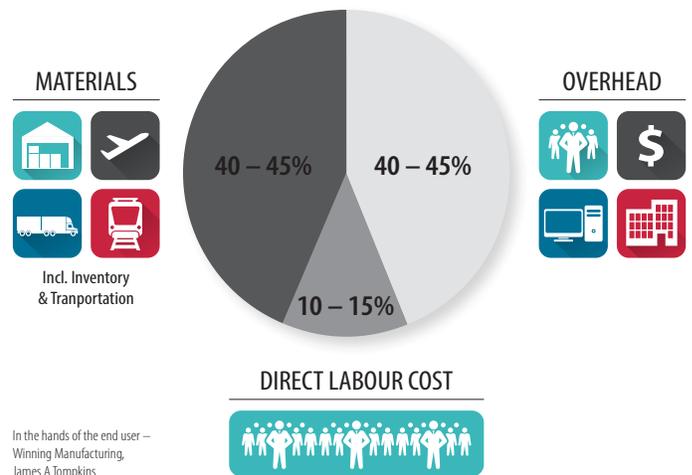
Of particular relevance is the comparative cost of a manufactured product in the hands of the end user (Ref. J.A. Thompkins “Winning Manufacturing”) which can be broken down on a percentage basis as:

- direct labour cost at 10% to 15%
- overhead cost including staff, facilities, equipment, finance at 40% to 45%
- materials cost including inventory and transportation at 40% to 45%

### Principal International Transportation Corridors



### Total Cost of a Manufactured Product



### THE LOGISTICS SUPPLY CHAIN

Competitive world economies, together with advances in technology, have resulted in the evolution of the Logistics Supply Chain.

As an example, transportation is no longer considered by mode (road-rail-air-sea), but as part of a continuous process, which can include manufacturing or processing activities.

The Logistics Supply Chain in its entirety commences with product development-commercialisation – manufacturing and finally transportation to the end user. This is achieved using different transportation modes according to the required level of service and cost.

As a result, principal trade routes exist for the movement of freight by land, sea, and air, with the creation of intercontinental gateway locations such as Rotterdam, Frankfurt, Hong Kong, Singapore, and Los Angeles.

These serve industrial and logistics zones for the manufacturing,

Cost effective intermodal rail services as part of the transportation function are an important element of the Logistics Supply Chain.

These are an integral part of an overall solution in the moving of product to the end user contributing to the competitiveness of a region or country.

### USA—EUROPE—CHINA. INTERMODAL RAIL

The recreation of freight rail on the African continent needs to capitalize on the knowledge gained in other countries.

#### The USA

The United States is the largest user of intermodal services in the world, driven by long travel distances to major consumer markets and the country’s competitive nature.

Similarities exist with South Africa in the movement from gateway

seaports such as Los Angeles – Long Beach to inland locations such as Chicago, Dallas, and Atlanta.

Intermodal rail activity includes TOFC-COFC (trailer on flat car–container on flat car) traffic in addition to using double stack configurations.

The resulting rail car designs accommodate the transportation function including the movement of 20 ft. - 40 ft. and 53 ft. containers in addition to trailers with a 53 ft. length.

Network designs further have a focus on point-to-point movements along high usage corridors motivating the redesign of intermodal terminals. This results in the dedicated use of unit trains not requiring classification/ marshalling yards adjoining them.

## China

While China has created a significant infrastructure in high speed rail, 76% of freight within the country moves by road.

However, the importance of intermodal rail is recognized by their recent international Belt and Road initiative.

The growth of e-commerce has motivated China’s efforts toward a more efficient sea-air-land logistics infrastructure.

While initial export processing zones were established in proximity to deepwater ports such as Hong Kong, subsequent inland industrial and logistics parks resulted in an expanded transportation network.

As an example, shipping companies such as OOCL move freight to/from seaports such as Shanghai using dedicated unit/block trains.

## Europe

While trains in Europe are constrained to less than half the length of the USA, it has developed a network of high-speed trains (Eurostar, Acela, TGV and ICE).

This capability was used by the TGV Postale for the movement of post by rail, although it was discontinued due to the reduced postal volumes.

In contrast, Italian Rail (Mercitalia) utilizes high speed technology for the movement of express freight from Naples to Bologna.

This technology could be incorporated into a future African Integrated High Speed Railway Network AIHSRN.

## Africa

The development of efficient transportation corridors within Africa would stimulate inter Africa trade and manufacturing activities.

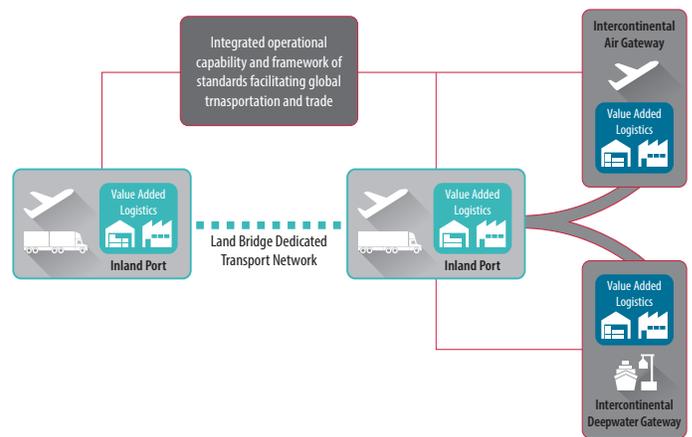
While legacy rail operations in Africa often utilized a European model, these are not necessarily applicable, due to the continent’s different nature and geography. This is in contrast to the use of longer double stacked unit trains over long distances in the USA and elsewhere.

## THE LANDBRIDGE – TRANSPORTATION CORRIDOR

Point to Point movement of freight on long distance high density corridors makes use of the Landbridge. This approach involves the uninterrupted movement of unit/block trains on a secure land corridor to inland port locations.

Previously the movement of freight to inland container depots utilized classification/ marshalling yards for the assembly of the

## Twinned Inland Ports and Logistics Gateways



rolling stock. In contrast, the Landbridge concept uses dedicated unit/block train movement, which results in the creation of industrial/logistics parks at origin and destination points.

The approach has, therefore, stimulated the creation of centers of manufacturing and warehousing.

These are located adjoining the intermodal yards, minimizing drayage while facilitating secure and bonded movement and the creation of Special Economic Zones.

The model also enables the use of alternative business arrangements, including Public Private Partnerships, while attracting Foreign Direct Investment.

## TRANSPORTATION CORRIDORS

The maximization of a corridor’s capability is important to its competitiveness.

As an example, in the USA the Heartland Corridor connecting the Port of Virginia with intermodal yards in Columbus (Ohio) and Chicago (Illinois) invested \$320 million to improve the route.

It involved shaving 230 miles from the trip to Chicago, via an easier route, and increasing the height of the tunnels to handle 20 ft. 3 in. rail cars (double stacked).

This enables trains to transport twice as much cargo in less time, as a determining factor for shipping lines and importers/ exporters.

South Africa’s existing “legacy” transportation corridor from the Port of Durban to Gauteng is characterized by steep gradients, tight curves and numerous tunnels.

In contrast, the Eastern Transportation Corridor from Ngqura/ Port Elizabeth has more gradual gradients and one major tunnel. However, the distance on this route to City Deep in Johannesburg is longer.

Therefore, while the NATCOR line has been the default corridor to Gauteng, the creation of a competitive operating environment motivates a rethink of options.

This includes the Trans Kalahari Corridor connecting the newly constructed deepwater port in Walvis Bay to sub-Saharan Africa in addition to the possible redevelopment of the Eastern Transportation Corridor as an inter-modal route.

## MARKET CAPTURE

Numerous studies have been undertaken to analyse South African intermodal rail's capability to compete with truck traffic. These have been focused on the NATCOR rail line and the N3 highway, they being the shortest distance by line of site to the Port of Durban.

The comparative analysis has been on the basis of rail's traditional or "legacy" rail model. This considers existing operational concepts, systems, and rolling stock types, while primarily focusing on a traditional market scenario.

Competitive intermodal rail operations presently adopt a new model, integral to the Logistics Supply Chain where rail transport is not considered in isolation.

An example is the inbound movement of international freight from the Port of Los Angeles/Long Beach by rail to inland gateway locations in North America.

This can involve the destuffing of ISO type containers prior to their inland movement. The freight is then processed/customized and re-packed into 53 ft. containers or trailers. The approach involves loading according to a drop off sequence at the final destination.

This offsets the advantage of a truck with a trailer length of 53 ft. versus a 40 ft. container while significantly reducing the number of steps required to deliver to a final destination.

The use of such an approach further attracts higher value-added product with larger margins.

## A NEW INTERMODAL MODEL

The rethinking of intermodal rail in South Africa is, therefore, critical to market capture and the creation of new business opportunities.

Principal elements of such an approach would include:

- Utilizing the operational solutions used by Hunter Harrison to turn around such rail carriers such as CN and CSX in North America
- Making use of the landbridge concept on the high usage corridors while connecting sea-land gateway locations, providing higher levels of service.
- Achieving an increased utilization of assets suited to an expanded market type.

As an example, the Tambo Springs Logistics Gateway initiative addresses these issues. It considers operational needs both within and outside the project land area.

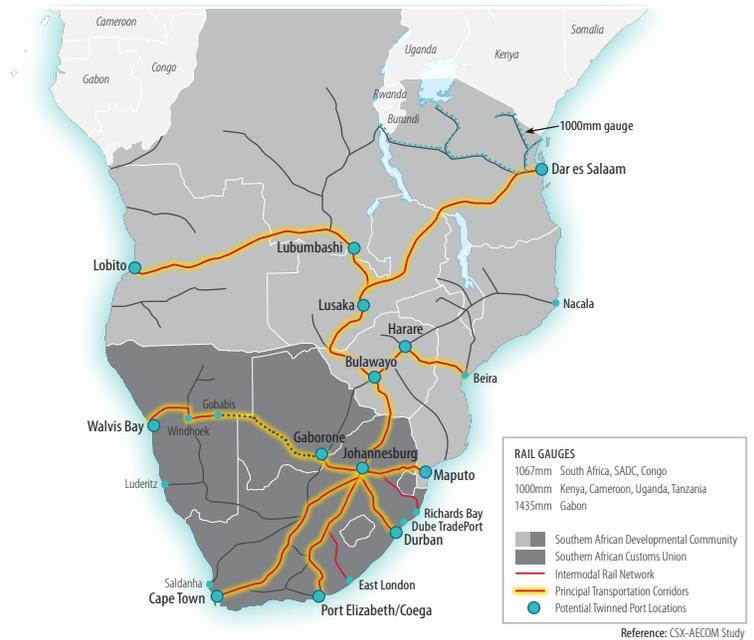
This includes the twinning of sea-land-air port locations with Tambo Springs enabling the secure and bonded movement of freight between associated manufacturing and processing zones. Such an approach contributes to a competitive operating environment as part of a network of locations.

## TRANS AFRICAN NETWORK

The creation of a Trans African Network of corridors using the Tambo Springs prototype would contribute to economic development and job creation in Africa.

Such an integrated network would use competitive intermodal

## Potential Sea-Inland Ports and Rail Network



rail to connect industrial/distribution logistics parks and terminals. These would act as focal points such as the Special Economic/Export Processing Zones used in China, while focusing on exports and intra-African trade.

The goal being both to recoup the manufacturing capability which has moved to China and addressing the growing e-commerce market both on the continent and elsewhere.

The development of logistics gateways connected by smart and secure transportation corridors would be an important part of an African Competitive Strategy.

This network of locations would incorporate sea-inland and air ports enabling the efficient movement of freight on a time critical and time definite basis as a competitive capability.

Both local and multi-national corporations would, therefore, be motivated to invest on the continent to serve the African and international markets.



Franco Eleuteri is a recognized specialist in the development and implementation of internationally competitive solutions in the fields of manufacturing, distribution, sea-air-land transportation and master developments. This is a result of knowledge and expertise gained on projects in North-South America, Europe, Asia, and Africa, working with both the public and private sectors.