

# PROVIDING A SUSTAINABLE RAIL FREIGHT SERVICE ON THE PORT ELIZABETH - AVONTUUR NARROW GAUGE RAILWAY

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## INTRODUCTION

South Africa's extensive rail network, which in the past provided an effective transportation link between most of its towns and cities, has contributed significantly towards the economic development of more remote regions in the country. Unfortunately during the past three decades, mainly due to competition from road transport, the majority of branch- and narrow gauge lines serving rural communities have been abandoned.

At present only two narrow gauge (2 foot or 610 mm) lines remain operational in South Africa primarily because of their tourist potential, one in Kwazulu-Natal and the other one in the Eastern Cape. Their future however is uncertain as increasing maintenance and operating expenditure threaten to exceed income. In addition road haulage companies continue to draw existing clients away from rail transport.

This paper discusses the economic potential of one of the two remaining narrow gauge lines, the one located in the Province of the Eastern Cape. (The findings however, should prove generic to other rail projects in South Africa and the rest of the sub-continent.) Originally constructed to haul export fruit from the fertile Langkloof and Gamtoos Valley to the harbour at Port Elizabeth (PE), this "little" railway has in recent years become famous because of its tourist train named 'The Apple Express'.

Despite its fame, this railway has lost its main source of income, which is the conveyance of export apples from the Langkloof, to competitors from road transport companies. At present, moving the fruit by road is the preferred option because it is more flexible and faster than the rail service. Regrettably, the negative environmental impact of large trucks on narrow country lanes is mostly overlooked. Upgrading of Route 62, the main access road into the Langkloof, is long overdue. It is however, questionable whether funds for road reconstruction will be made available as the Provincial Government has indicated in recent press statements that there are numerous higher priority road maintenance projects in poorer parts of the province. Because of this, it can be expected that Route 62 will rapidly deteriorate, affecting the efficiency and costs of road transport of fruit and deterring tourist vehicles from visiting the area.

The paper presents the intended study, which is to investigate the possibility of maintaining sustainable rail services on this line that will be of benefit in many ways to all the communities served by it. The initial focus will be on freight services only, but other possibilities which will require future investigation include the reintroduction of a passenger service on certain sections of the line, including a proposed commuter service between Port Elizabeth's Western Suburbs and its Business Districts, the conveyance of solid waste from rural towns to suitably located and approved landfill and/or recycling sites, and further expanding the railway's tourist potential.

Hopefully, this project will revive interest in South Africa's under-utilised rail network and encourage others to look critically at our remaining rail infrastructure as an asset and a viable and environmentally more suitable alternative to road transport.

## **SUSTAINABLE LAND TRANSPORT: ROAD vs RAIL**

### **Environmental impact**

The idea of a steel wheel rolling on a steel rail, with multiple vehicles in tow, is virtually unrivalled for efficiency and economy. [5] A train requires much less energy to move its load between two nodes than the number of road vehicles which will be required to haul the same tonnage (or passengers) over the same distance. An interesting comparison: A horse can move a ton of freight by road, yet the same animal can haul 5 tons if the load is rail-borne. [10] From a purely environmental point of view, rail transport is therefore a more sustainable mode of transport than its road counterpart because of lower energy-consumption needs.

In the past, with the main focus on economic issues and the creation of monetary wealth, transport systems were developed with little regard to the side effects of such systems on the environment and to the depletion of natural resources. Nowadays the environmental awareness of our society demands a broader consideration of transportation impacts and today the energy efficiency of railways is more important than ever in a scarce and expensive petroleum-powered environment.

Noise and air pollution should also be considered, especially where heavy road vehicles are involved. Noise in this context is defined as sound unwanted by the recipient [14]. Very little has been done in South Africa to reduce traffic noise through the use of roadside noise screens such as those found on the Autobahns in Germany. As the number and size of commercial road vehicles on our roads continue to increase, the noise problem is also likely to intensify. By moving to rail transport the negative environmental impacts of noise and air pollution caused by large road vehicles can be reduced.

When comparing the two main land-freight transport competitors, road and rail, it is also necessary to consider other criteria such as safety, aesthetics and their influences on the social and physical environment. Road safety in South Africa is a major concern to the authorities and expensive campaigns are launched annually to reduce the number of accidents on the country's road system. A more successful strategy may be to reduce traffic on the roads by deliberately encouraging the shifting of traffic, especially freight traffic, from road to rail. Trains are a much safer option because, unlike cars, busses and trucks, their movements are guided and controlled.

### **Economic aspects**

In South Africa a detailed economic comparison between road and rail transport is a complicated exercise mostly because of unequal subsidies among competing modes. Cross-funding of road freight by taxpayers amounts to subsidisation of private road haulers, allowing road freight to be under-priced to the disadvantage of the country's rail service [6].

A similar situation existed in Great Britain during the nineteen sixties where taxpayers paid for all road improvements to the benefit of commercial road users. At the same time all improvements to the railways had to be paid for by a diminishing number of rail users. The so-called Beeching report, published in March 1963, called for the closure of all rail lines where expenditure exceeded income [9]. This report completely overlooked the social and economic impacts on communities served by rail, which illustrates the danger of approaching this problem only from the accountant's angle.

Rail is more economical than road where commodities need to be conveyed in bulk over long distances [5]. On the other hand it is difficult for rail operators to compete with road transport companies where high-value or service-sensitive goods are hauled over short distances. In the United States road trucks continue to increase their share of the land transport market because of their flexible, dependable and tailored service, their favourable short-haul economics and the convenience of handling smaller shipment sizes [5]. The same conditions exist in South Africa, making it difficult for those railway lines that do not carry bulk commodities to compete with road haulers.

### **Social and developmental issues**

By focusing only on economic issues, the railway authorities in South Africa, Spoornet, and Government in its role as Spoornet's only stakeholder, have so far neglected the negative impact of rail closures on rural communities previously served by rail. A study by the Centre for Development and Enterprise in 1996 indicated that approximately 75% of the country's poor people and 81% of its very poor people live in rural areas, mostly in the hinterland of small towns [13].

Termination of rail services create a chain reaction which starts with loss of employment in rural areas, migration of the unemployed to urban areas in the search of work, and further expansion of informal urban settlements which are neither environmentally nor socially sustainable.

In order to meet its social responsibility towards the poorest of the poor in South Africa, Government should consider subsidising uneconomical rail services to limit further economic and social degeneration in rural areas. It is interesting to note that several states in the US subsidize their short-line, known as branch line in the South African context, railroad operators [5]. Although economists may be sceptical about a subsidised rail service, it should be realised that road transport is currently heavily subsidised by the South African taxpayer primarily because tax money is used for road maintenance. It is debatable whether road haulage companies will show any profit if they had to pay for the damage caused by their trucks to road infrastructure. In contrast with this, Spoornet has to maintain rail infrastructure by using its own funds [6].

Perhaps it is now necessary for Government to step in and reduce cross-subsidisation in the road transport industry in order to do away with unfair competition in the land-freight market.

### **THE GOVERNMENT'S CURRENT VIEW ON THE FUTURE OF RAIL TRANSPORT**

Transport Minister Dullah Omar, in a 2000 parliamentary media briefing discussing action areas for 2001, made the following comment on rail transport:

*“In South Africa itself, government has set as a priority the shifting of as much traffic as possible – both freight and passenger services – from road to rail. There are many grounds for this, the most obvious being:*

- *safety,*
- *environmental protection,*
- *levelling the playing field for fair modal competition, and*
- *road infrastructure preservation” [7].*

Regarding rail infrastructure in the Eastern Cape, Government has drastically shifted away from the picture presented by the then Transnet Chief Executive Officer (CEO) Saki Makozoma in 1999 when he predicted that only the main line from Port Elizabeth to the north will be retained. The Government has now indicated that it will not close down unprofitable railway lines in the Eastern Cape at this stage. On 3 June 2001 Public Enterprises Minister Jeff Radebe made the following statement:

*“The Government has taken a different view in that we are going to allow for a sufficient period to assess the impact of the various rail reform initiatives, before deciding on what is economical and what is uneconomical as the anticipated increased freight on our rail network is bound to render some of the presently non-viable lines viable.”*

Minister Radebe also mentioned that a careful assessment of the social impact of the closure of uneconomical lines must be undertaken before closure. He commented that it is Government’s intention to *“redirect freight from road to rail without compromising the users from both a cost and time perspective” [8].*

This discussion, with its focus on the sustainability of the PE-Avontuur Narrow Gauge Railway, is in accordance with Government’s intention to retain and develop rail infrastructure as the preferred overland mode of transport.

## **THE PORT ELIZABETH – AVONTUUR NARROW GAUGE RAILWAY**

### **Background to the longest narrow gauge line in the world**

Act 40 of 1898 authorized the building of a narrow gauge railway from Port Elizabeth to Avontuur to serve the Langkloof, a fertile valley located to the west of Port Elizabeth. The topography of this region can best be described as hilly with numerous rivers and streams intersecting the route of the railway. For this reason a narrow track gauge of 610 mm was selected as it could more easily follow the contours and be built at a much lower cost than a normal South African standard gauge railway [1].

Survey parties started to plot the proposed route towards the end of March 1899. Formidable natural barriers lay across the little railway’s path. The deep and narrow Van Staden’s Gorge presented railway engineers with a major challenge. A 77 m high steel trestle bridge was eventually constructed to span the gorge and to this day it remains the highest narrow gauge railway bridge in the world [2].

The 285 km main line to the terminus at Avontuur was completed in January 1907 and a 27 km branch line from Gamtoos Junction to Patensie in the Gamtoos Valley was officially opened on 3 April 1914 [2]. To date it remains the longest operational 610 mm gauge railway in the world. Despite initial competition from ox-wagons, the railway soon started showing a profit and over the years its successful operation has brought prosperity to the farming communities served by it [1].

## **No more apples on the Apple Express**

Prior to the mid-1980's most of the export apple crop from the Langkloof was carried by rail to the harbour at Port Elizabeth. From 1983 onwards road trucks started hauling an increasing portion of Langkloof fruit to the ports of both Cape Town and PE.

The ingress of road transport into this market was mainly due to the lifting of restrictive legislation that protected the rail service countrywide against competition. The law specified that outside a certain radius goods must be transported by rail. A road transport company had to apply to the local road transportation board for a permit to convey goods outside the allowable radius. Free operations were only permitted within city limits [3].

Since the full deregulation of freight transport in 1990 [6] the railways had to compete with private road haulers on the open market. This signalled the beginning of the end for numerous branch line and narrow gauge operations in South Africa.

As from 1999 LANKO, the largest fruit packing and distribution company in the Langkloof area, no longer utilises the rail service. In an interview with Mr S. duT. Grundling (personal communication, July 17, 2001), the Executive Manager at LANKO, he gave the following reasons as to why their produce is moved via road and not by rail:

- During the 2001 fruit season 70% of LANKO's export loads were shipped out in standard 6 m and 12 m containers. At present the narrow gauge railway does not have the necessary facilities for handling bulk container traffic.
- A large percentage of LANKO's fruit is exported through the port of Cape Town. These shipments are hauled by road as a direct rail link between Cape Town and the Langkloof does not exist. In addition, export agents prefer to use Cape Town because of inadequate handling and storage facilities at PE's harbour and because fewer ships dock in PE than in Cape Town.
- Fruit destined for the local markets (mostly Kwazulu-Natal and Johannesburg) is transported by road only. The narrow gauge railway cannot offer the same level of service to local destinations because re-loading is required at the rail terminal in PE. This is a disadvantage for the rail service from both a cost and a time perspective.

LANKO is not the only fruit exporter who does not utilise the rail service. Several Langkloof farmers operate their own packing and cooling facilities. They rely entirely on road transport mainly because their farms are not served by rail sidings. It is also not profitable for the railway to handle small consignments of fruit.

Spoornet, because of its rigid tariff structure and centralised control of services, cannot compete with road transport companies who are able to offer a personal, customised and flexible service to the farming community. The withdrawal of staff at rural stations as part of Spoornet's rationalisation programme and the limited authority delegated to line managers have severed the direct link between the client and the rail service provider.

## **Success in the Gamtoos Valley**

Patensie Citrus Limited, founded as an agricultural co-operative in 1928 and registering as an independent company in 1998 because of a new deregulated marketing environment, is still using the narrow gauge railway to convey export fruit to the harbour at Port Elizabeth.

In an interview with Mr W.M. du Preez (personal communication, June 1, 2001), the Managing Director of the company, he explained why the rail service is the preferred option for transporting the seasonal citrus crop:

- The loading facilities at the Patensie Citrus package plant were designed for rail transport and are well served by rail sidings. To convert existing infrastructure to cater for bulk road transportation will require extensive capital expenditure.
- It is of strategic importance for the company to maintain a rail link with Port Elizabeth. The existing road in the Gamtoos Valley, the only surfaced access road to the area, is in a poor condition and is not properly maintained. A typical example of this is that vegetation and debris are no longer cleared around culverts, increasing the risk of flood damage to road infrastructure.
- With an operational railway the benefit of competition is retained as transport agencies are forced to charge competitive rates, which is beneficial to the fruit producers in the Gamtoos Valley.
- The surfaced road linking the valley with Port Elizabeth is currently in a poor condition and, by using rail transport, the risk of damage to citrus fruit while in transit over badly corrugated roads is avoided.
- A good working relationship exists between Patensie Citrus and Spoornet staff. A typical example of this was the modification of rolling stock by Spoornet workshops to accommodate pallet loads.

Mr du Preez also mentioned that at least twelve farmers in the Gamtoos Valley have their own packing facilities. They produce approximately 20% of the export fruit in the valley and, because individual farms cannot be served by rail, they are dependant on road transport.

During the 2001 citrus season a large percentage of the export crop from the Gamtoos Valley was diverted to Cape Town's harbour. This was mainly because of the limited capacity of the cooling facilities at PE's harbour. The tariff for storage of fruit at Cape Town is also less than the rate charged in PE. This is bad news for the narrow gauge railway as fruit destined for Cape Town is taken out by road and not by rail. (C.R. Muller, personal communication, January 8, 2002)

### **Other freight operations and income generating activities**

Up to May 2000 limestone railed from the PPC quarries near Loerie to the cement factory in PE constituted a major portion of the narrow gauge railway's income. With the decommissioning of the quarries in 2000 the railway lost a sizable portion of its revenue [11].

The following information on current freight operations and income generating activities were obtained from Mr C.R. Muller, the General Manager, Narrow Gauge. (personal communication, January 8, 2002):

- At this stage pulpwood produced from the Work-for-Water Project is the main commodity transported outside the citrus season. The wood is transferred from narrow gauge to normal gauge in PE from where it is railed to a paper mill in Richards Bay.

- A charcoal factory, which obtains its raw materials from sub-contractors working for the Work-for-Water project, operates at the rail siding at Two Streams. Spoornet benefits financially from this operation by leasing its facilities at Two Streams to the factory.
- Treated wooden poles, produced by Woodline Timber Industries at Kareedouw, are transported by rail from Assegaibos Station to PE from where it is exported. Creosote, a chemical used in the treatment process, is shipped via rail in the opposite direction in standard 6 m containers.
- Cement is transported in containers from the PPC factory in PE to the Humansdorp and Kareedouw farming co-operatives. Other container traffic include fertilizer which is delivered to Nitrochem in Humansdorp. The goods shed at Humansdorp station is leased to Nitrochem on condition that they utilize the rail service.

According to Mr Muller, Spoornet's focus is now on full train-load consignments. It is therefore not always possible to meet the expectations of small customers. This strategy places the future of the PE-Avontuur narrow gauge railway in jeopardy and could force some of the existing rail clients to move from rail to road transport. Mr Muller also mentioned that rail tariffs are determined by Spoornet's Commercial Department and are no longer controlled by individual line managers.

At this stage it is necessary to investigate possible measures that could be taken to maintain existing freight services on the narrow gauge and to secure a larger portion of the transport market in both the Langkloof and the Gamtoos Valley.

## **A SUSTAINABLE RAIL FREIGHT SERVICE: SOME RECOMMENDATIONS**

### **Community participation**

An excellent example of community involvement in a rail project is the success of the Grahamstown Railway Job Creation Project (GRJCP) in re-establishing a rail link to Grahamstown. The GRJCP, in partnership with other local organisations such as the Grahamstown Transitional Local Council, Rhodes University and Grocott's Mail newspaper, has since 1994 played a crucial role in the revival of the Grahamstown branch line. To date there has been a steady annual increase in both passenger and freight traffic, mainly because of GRJCP efforts in identifying potential rail customers and creating favourable conditions for rail users [10].

Some of their recent achievements are listed below:

- Reintroduction of a passenger service between Grahamstown and Alicedale (a junction on the Johannesburg – PE main line) since 1995. The rail service is currently the only transport service between Grahamstown and Alicedale, the latter town being served by gravel roads only.
- Spoornet has undertaken to renovate passenger facilities at Alicedale and there is the possibility of another job creation project at Alicedale's electrical depot;
- A six month contract to move military equipment from Grahamstown to PE was secured in 2000;
- Providing a complete rail/road/rail container service at the Grahamstown terminus;

- In September 2000 a local entrepreneur from a previous disadvantaged community, working in conjunction with the Work-for-Water Project, began to rail wattle wood from Grahamstown to Richards Bay. He is currently one of three timber clients using the Grahamstown branch;
- To date regular freight carried on this line include bonemeal, cement, chemicals, coal, CX-containers, domestic water, granular and liquid fertilisers, kaolin, lime, lucerne, molasses, organic fertiliser, salt and wattle wood;
- Spoornet recently commissioned a road cartage agent in Grahamstown who liaises with the GRJCP to secure more cargo for the rail service.

The possibility of initiating similar schemes in the Langkloof and the Gamtoos Valley should be investigated. As a first step it will be necessary to identify all potential role players. This could include community leaders, local business chambers, local industries and farming co-operatives. Spoornet officials should actively participate in all stages of such a project, from planning right through to implementation and beyond. With community involvement and people accepting 'ownership' of 'their' railway, problems such as vandalism and theft of railway property, which add to the degeneration of rail infrastructure, should hopefully disappear.

### **Privatisation of rail operations**

Privatisation of state assets is currently a sensitive political and economical issue in South Africa. The majority of local trade unions are against privatisation mainly because of fear of job losses. A typical example of this is a 1995 proposal to privatise the PE-Avontuur narrow gauge which was discarded due to opposition from both railway unions. (C.R. Muller, personal communication, May 30, 2001)

The decision makers in South Africa should take note of what has happened in Britain since that country's rail network was privatised in the mid 1990's. On 1 April 1994 state-owned British Rail was officially privatised when all rail infrastructure was handed over to Railtrack and train services were distributed amongst 25 operators [12]. In the year 2001 the whole process is being reversed after Railtrack has suffered severe financial losses. In addition to this, two rail disasters, the Southall train crash in 1997 which killed 7 people, and the Paddington collision between two passenger trains in 1999 which claimed 31 lives, have contributed to the negative public perception of privately owned rail services. An inquiry into the Paddington rail disaster alleged that the private rail operator has put profits before safety. [12]

Charlie Lewis, in a paper read at the AFRICA RAIL 2000 conference, suggests that South African rail operations should be privatised, but that rail infrastructure should remain state-owned and maintained by the state [6]. This will be in line with the road system where private hauliers use state-owned roads. In addition, he suggests both rail and road operators should carry the true costs of their track/road use.

An alternative to privatisation is to outsource certain activities to the private sector on a tender basis. This will keep the line under Spoornet ownership, but individual businesses could offer rail clients a more flexible and competitive service as bureaucratic central control will be abolished in the process.



## **Retaining and expanding existing freight services**

As in any business customer satisfaction is an essential ingredient to ensure long term survival, especially in the competitive transport market. At this stage it is necessary for Spoornet to determine the current and future requirements of existing rail customers and to satisfy their demands as far as it is possible within the present financial limits. Patensie Citrus has already indicated that in future most of their fruit will be packed and shipped in standard containers. Spoornet should therefore take note of this and upgrade their existing facilities, including the inadequate cooling facilities at the PE harbour, to retain and maybe increase their share of transporting the annual citrus crop.

In order to identify potential rail customers it will be necessary to study current economic activities in the Langkloof and in the Gamtoos Valley and to predict future trends, especially in the agricultural sector. An aggressive marketing strategy in conjunction with an efficient rail service will be required to gain new clients. This will only be possible once existing constraints imposed by Spoornet's bureaucratic and centralized control over regional operations have been removed.

An investigative study should be made to establish what steps should be taken to regain a share in transporting export apples from the Langkloof. Such a study should also consider the feasibility of bringing in bulk loads such as packing material, fertilizers, chemicals, irrigation pipes, cement, etc. on empty fruit trains.

## **CONCLUSIONS**

In order to retain valuable economic assets, Spoornet should drastically reverse the current trend of extensive scrapping of services. An efficient rail service could act as a stimulant for sustainable economic development and advance the economic empowerment of poor communities in rural areas. Profitability should not be the only yardstick by which sustainability is measured. We cannot afford to ignore social and environmental issues any longer. Several unprofitable services in all walks of life are delivered simply because they serve a useful purpose and are convenient to customers. A typical example of this is the door-to-door postal delivery service in South Africa. It seems reasonable that transport, and especially rail transport on account of its strategic value, should be treated in the same manner.

The strategic importance of rail infrastructure is now more prominent than ever, especially if one considers the rapid deterioration of the country's road infrastructure and the difficulty in securing funds for road maintenance when competing with politically more sensitive issues such as health and education.

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