REVISITING THE ROAD VERSUS RAIL DEBATE

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ABSTRACT

Some transportation professionals are suggesting that rail, because of its apparent technological inferiority in comparison with road, has become an obsolete mode of transport for the conveyance of general freight. They argue that road transport, because of its greater flexibility, speed and adaptability, is more aligned to meeting customer requirements than rail.

The South African government, on the other hand, has made a firm commitment to shift cargo from road back onto rail. Spoornet, the national rail operator, intends to increase its network capacity for the handling of general freight from the current 86 million tons per annum to 160 million over the next five years. To achieve this objective almost R9 billion of the company's R16 billion 5 year capital expenditure programme has been earmarked for upgrading of the general freight lines.

This paper re-examines the road versus rail debate in the current South African context with the intent of determining whether investment in rail infrastructure is a feasible option. Some factors that are considered include the technical limitations of South Africa's existing railway system, the rapid growth in road freight transport together with the subsequent deterioration of road infrastructure and the challenge of meeting sustainable development targets.

1. BACKGROUND

In South Africa the road versus rail debate between stakeholders in the respective industries originated in the 1930s when rail started losing customers to the rapid developing road transport industry. Government intervention, through the controversial Motor Carrier Transportation Act, Act 39 of 1930 (Van Lingen 1960:171), enabled rail to remain the dominant overland transport mode until deregulation of the transport industry began in the mid-1980s.

A study of press reports and articles in transportation journals show that the road versus rail debate probably reached its zenith in South Africa soon after the full de-regulation of the transport industry in 1990. However, by the year 2000 this rather contentious issue had become less topical, primarily because of phenomenal growth in the road transport industry to the detriment of rail. Even the staunchest supporters of rail transport had to admit that Spoornet, the government-owned rail utility, was ill-prepared to compete in the post-1990 deregulated environment.

There is at present renewed interest in rail, mainly because of Government's commitment to improve the country's dilapidated rail infrastructure over a five year period. Spoornet has

allocated almost R9 billion of its R16 billion 5 year capital expenditure programme to the upgrading of its general freight lines. The intention is to increase the carrying capacity on these lines from the current 86 million tons per annum to 160 million tons by 2010. (Transnet Annual Report 2005:18, 31-32.)

Understandably there are opposing viewpoints on Government's intention to shift freight from road back onto rail. On the one hand the advocates of rail transport are supporting Government in this initiative, while also calling for drastic intervention to 'level the playing field' between road and rail. The road transport lobby, on the other hand, is claiming that in the post-1990 deregulated environment the 'playing field' between the two competing modes is in fact level and that choice of mode should be determined by market forces only.

This paper critically re-examines the road versus rail debate in an attempt to determine if the planned capital expenditure on rail infrastructure will (1) yield satisfactory returns in investment and (2) to what extent an improved rail network could contribute to sustainable socio-economic growth in especially underdeveloped rural areas.

2. THE CURRENT STATUS OF ROAD FREIGHT TRANSPORT IN SOUTH AFRICA

2.1 Rapid growth in road freight haulage

The road freight industry has shown unparalleled growth since full deregulation of transport in 1990. Its success in capturing the majority share of the overland transport market in less than ten years is well documented.

Statistics of new commercial vehicle sales released by the National Association for Automobile Manufacturers (NAAMSA) over a seven year period are shown in Table 1 below and confirm the continuing growth in road freight transport.

Table 1. NAAMSA new vehicle sales statistics: Number of units sold per annum.

VEHICLE TYPE	YEAR						
	1999	**2000**	**2001**	**2002**	**2003**	**2004***	**2005***
Medium commercial (3 501 – 7 500 kg)	4 668	5 162	5 331	5 612	6 030	8 592	12 266
Heavy commercial (7 501 – 15 000 kg)	2 609	2 669	2 864	3 032	4 115	3 794	5 258
Extra-heavy commercial (>15 000 kg)	2 513	3 192	3 605	3 940	5 285	7 473	8 841
Total	9 790	11 023	11 800	12 584	15 430	19 859	26 365

*Since 1 January 2004 commercial vehicle types have been re-classified into the following mass categories: Medium: 3 501 – 8 500 kg, Heavy: 8 501 – 16 500 kg, Extra-heavy: >16 500 kg

The figures in Table 1 reveal how total commercial vehicle sales have soared from 9 790 units in 1999 to 26 365 in 2005, an almost threefold increase over the seven year period. Of particular interest is the growth in sales of extra-heavy commercial vehicles, the dominant long-distance freight haulers. Units sold per annum have more than tripled in seven years, from 2 513 in 1999 to 8 841 in 2005. This illustrates to what extent the road freight market has expanded and continues to expand.

2.2 Deterioration of road infrastructure

Judging by recent press reports, there is currently increased awareness and concern amongst the public about South Africa's deteriorating road network. It can be argued that maintenance and upgrading of national roads is keeping pace with traffic growth. However, the stark reality is that the life cycles of provincial roads have been significantly shortened by this increasing number of heavy freight vehicles, whose damaging effect to the road pavement layers thus increases exponentially.

While most of the national roads, managed by the South African National Roads Agency Limited (SANRAL), are still in a serviceable condition, many provincial roads are in a serious state of disrepair. In the Eastern Cape, potholes, deep ruts and edge break along most of the secondary roads are visible indicators of serious distress in the road layers.

Table 2 below provides some indication of how road maintenance expenditure varied amongst the different road authorities in the financial year 2000/01. (Excluded from this table are about 221 000 km of unproclaimed gravel and earth roads which are not covered by provincial budgets.)

Table 2. Road maintenance expenditure 2001.

Road Authority	Rural road network (km)	Expenditure in 2000/01 fiscal year (R'000)	Comparative cost allocation per km (R)
Northern Cape	71 378	91 622	1 284
Free State	49 116	155 749	3 171
Northwest	35 901	270 134	7 524
Eastern Cape	48 582	383 455	7 893
Western Cape	39 985	415 924	8 561
Mpumalanga	25 058	216 482	8 639
Kwazulu-Natal	50 883	720 351	14 157
Limpopo	28 847	586 706	20 339
Gauteng	7 668	343 468	44 792
SANRAL	6 713	708 488	105 540

(Source: Annual Transport Statistics 2002, Table 2.2.4.)

The above statistics show that in 2000/01 total road construction and maintenance expenditure for the 357 688 km provincial rural road network was R3,184 billion, which equates to R8 908 per kilometre. This is about 8% of SANRAL's equivalent allocation of R105 540/km for the national road network and provides some insight as to why many provincial roads are crumbling, in contrast to national roads which are generally still in a good condition.

The cumulative backlog for rehabilitation and maintenance of provincial roads in Kwazulu-Natal (KZN) over an eight year period up to 2002 is estimated at R2,9 billion. The KZN Department of Transport warns that 'unless this situation is adequately addressed, the efficiency and costs of road transport will be adversely affected'. (White Paper on Freight Transport Policy 2004.)

It is claimed that R15 billion is needed to rehabilitate the Eastern Cape's dilapidated road network (Petzer 2005). This is a rather substantial amount, considering that the total provincial budget is about R33 billion. The end result could be a drastic increase in road haulage tariffs, provided of course that the 'user pays' principle is applied.

If provincial roads continue to deteriorate at the current pace, the cost of road transport will definitely escalate due to claims for damage to goods while in transit and increased vehicle maintenance costs. Against this backdrop there is merit in government's intention to shift cargo from road to rail.

2.3 Some problems associated with road freight transport

Most businesses in South Africa are at this stage very dependant on the services provided by road transport companies and the latter's positive contribution to economic growth and development cannot be ignored. Unfortunately it is also clear that some road freight operators are focussed on maximising their profits and nothing else.

An unacceptably high number of road freight vehicles are overloaded beyond the legal limit, increasing the magnitude of imposed loads on road pavements, bridges and culverts. In the process life cycles of road infrastructure are reduced, which impacts negatively on road maintenance budgets. Added to this is the cost of policing overloading, which includes not only the capital expenditure required for installing permanent weighbridges, but also the operational costs of manning them.

It is also a known fact that some truck drivers prefer to use lower order roads instead of national routes to avoid toll gates, weighbridges and traffic police. A typical example of this is where truckers are using the R72, the coastal road between Port Elizabeth and East London, instead of the N2. The higher number of heavy freight vehicles on this scenic route could impact negatively on the tourism industry on an increasing scale as the condition of the road deteriorates. What is also concerning is that many heavy vehicles are using this route at night to avoid the new weighbridge at Kinkelbos on the N2 which, due to staff shortages, is only operational during daytime. (Cohen 2004.)

To date the road freight industry has been unsuccessful in its attempts to be self-regulatory. Considering the hidden costs to the taxpayer due to overloading by unscrupulous road transport operators, government intervention may soon be necessary to counter the continuing abuse of publicly owned road infrastructure.

3. THE CURRENT STATUS OF RAIL FREIGHT TRANSPORT IN SOUTH AFRICA

3.1 Rail's market share for the conveyance of general freight

From the First State of Logistics Survey for South Africa (2004:27) it is obvious that road and rail only compete in a portion of the freight transport market. Road is the dominant mode of transport in the urban areas, while rail is almost exclusively responsible for the haulage of export coal and iron ore traffic. Competition between the two modes for the conveyance of general freight is therefore restricted to (1) the major transport corridors and (2) rural areas.

Based on the 2004 statistics, road transport carried 140 million tons of corridor freight and 210 million tons of rural freight. The corresponding figures for rail are 45 and 30 million tons respectively. This means that, outside of the metropolitan areas, about 82% of general freight was conveyed by road and only 18% by rail.

3.2 Spoornet: A history of poor service delivery

Since 1990 there have been numerous press reports about Spoornet's poor service record, the primary focus being the frustrations experienced by dissatisfied railway customers. In 2004 several of the rail utility's major clients, including some prominent export companies, threatened to convert to road transport if the rail utility did not step up its service levels (Wide-ranging strategy needed to put Spoornet back 2004).

Bailey and Thomas (2004) provide another perspective as to why rail has lost a significant portion of the market share for the conveyance of general freight. They state that 'South Africa's apparent rail strategy is to marginalize rail and focus on minimising perceived losses by cutting expenses – rather than developing an integrated transport model for the country.' This, according to them, 'has led to an almost total collapse of general freight transport by rail in South Africa.'

The Department of Transport (DoT), in its National Freight Logistics Strategy (2005:13), also refers to Spoornet's poor performance to date. According to the DoT report:

- Spoornet has lost much of its container traffic and high-value goods traffic to the road freight sector.
- The loss of traffic is attributed to poor operational performance, which is to some extent caused by the poor condition of its assets.
- A survey amongst rail customers indicated that most were dissatisfied with rail operations and rated rail as significantly below expectations.

It is obvious that within Spoornet, drastic intervention is required from executive management level downwards to improve the efficiency of the company's core operations, which, in turn, will impact positively on its profitability. The proposed investment in rolling stock and other assets is one of several necessary steps towards providing a satisfactory service to rail customers.

3.3 Technical limitations of South Africa's rail network

The South African Railway network, with the exception of a few narrow gauge branch lines, uses a rail gauge of 1 067 mm, which is less than the international standard gauge of 1 435 mm. In addition, horizontal and vertical clearances along railway tracks are less than international norms, which, together with the narrower rail gauge, restricts the maximum allowable width and height of rail vehicles. One of the penalties of this is that South Africa's railway system, unlike many of its international counterparts, cannot accommodate modern double-stack container wagons or 'piggy-back' operations where road semi-trailers are carried on flatbed rail wagons.

In comparison with roads railway lines require flatter gradients and larger radii for horizontal and vertical curves to overcome topographical constraints. In addition, in an attempt to limit initial construction costs, many of our railways were built along routes which avoided high mountain ranges and deep river basins. The result is that many rail links between major cities and towns in South Africa are considerably longer than the equivalent distances by road. The table below compares the respective rail and road route-kilometres between some of our main coastal cities.

Table 3. Rail and road distances between coastal cities.

Origin – Destination	Rail distance (km)	Road distance (km)	Additional distance by rail (%)
East London – Port Elizabeth	400	300	33
Port Elizabeth – George	520	330	58
Port Elizabeth – Cape Town	1 070	756	42

The longer distances places rail at a distinct disadvantage when competing with road for the conveyance of perishables and other time-sensitive goods. It also reduces the fuel efficiency per ton-kilometre of rail in comparison with road because of the greater rail distances.

3.4 Barriers to private sector involvement in rail operations

Spoornet, in an attempt to improve its financial performance, has terminated its unprofitable rail services on numerous of the so-called low-density lines (Van der Mescht 2005). For undisclosed reasons the company remains reluctant to lease or sell any of these underutilised assets to private rail operators. The end result is that valuable publicly-owned rail assets may soon be beyond repair because of vandalism and neglect.

An interesting case study is the Port Elizabeth-Avontuur railway that connects the Langkloof and Gamtoos Valley with Port Elizabeth. At least two private rail operators have shown interest to reintroduce rail operations on this narrow gauge line. From information obtained during personal interviews with some of the role-players, it appears that to date Spoornet officials have frustrated all attempts by private entrepreneurs to offer a revitalised rail service to local communities.

Spoornet, at this stage, is still the custodian of all state-owned rail infrastructure and rolling stock in South Africa. The visibly poor condition of most of these assets, together with Spoornet's failure to provide a service in rural areas, unfortunately add to the perception that rail has become an obsolete mode of transport in the 21st century.

4. RAIL REDUNDANCY – FACT OR FICTION?

There are differing viewpoints on Government's intention to increase capacity on the country's rail network. The advocates of rail transport are supporting the plan to shift cargo from road back onto rail. In opposition to this, a number of transportation professionals are questioning the viability of investing in rail freight infrastructure, arguing that road is well-established as the dominant mode for the conveyance of general freight.

Marsay (2005) is sceptical about Government's proposed investment in rail infrastructure, claiming that rail has become a 'technologically redundant' mode of transport in comparison to road. He calls for expansion of South Africa's national road network, rather than spending money on the railways. Using economic theory to substantiate his argument, he concludes inter alia that 'rail is technologically inferior to road transport for the majority of today's transport requirements'.

Stander and Pienaar (2005) also question the feasibility of committing capital to improve South Africa's rail system. They claim that, in comparison with road, 'rail freight movement appears to be less effective, at least from an infrastructure investment perspective'.

Many of the facts and figures emphasized by both Marsay (2005) and Stander and Pienaar (2005) are valid and cannot be disputed. The flexibility and adaptability of road transport makes it possible to carry different size consignments over varying distances in accordance with customer requirements. A rail operator, however, needs to haul bulk loads over relatively long distances to remain profitable. In addition, modern technology in the form of powerful trucks combined with good road infrastructure enables road haulers to provide a punctual door-to-door service which cannot be matched by rail. This makes road the preferred mode of transport for the conveyance of time-sensitive goods and just-in-time deliveries.

Despite the many advantages of road transport, there are some crucial matters that need to be considered before writing off rail as a redundant mode of transport. Stander and Pienaar (2005) admit that road freight haulers, as a group, are subsidised by motorists for use of the road network. They call for 'a more equitable road user charge for trucks'. Higher user charges for commercial vehicles, including toll fees that are directly

proportional to the gross mass of a vehicle, will increase road freight tariffs and improve rail's competitiveness from a purely cost perspective.

The performance of road freight operators is currently measured against a rail service which is inefficient, unreliable and unprofitable. This, unfortunately, provides a distorted perspective on freight transport issues by overemphasising the strengths and concealing the limitations of road transport. In the process the real challenges facing overland freight transport in South Africa could easily be overlooked

Results from The First State of Logistics Survey for South Africa (2004:iii,7) support the view that there is a definite need to upgrade our rail network. Here are some of the key road and rail transport issues highlighted in the 2004 survey:

- Although it is considered best practise to transport long-distance corridor freight by rail, with road providing the feeder and distribution services, 75% of long-haul tonnage in South Africa is conveyed by road.
- Conveyance of freight along the dense long-haul road corridors is on average more costly than a possible intermodal solution.
- The commercialisation and corporatisation of the state-owned railways in 1990 has resulted in critical underinvestment in rail assets and the illogical fragmentation of assets, processes and systems.

According to the KZN Department of Transport certain sections of the N3 road corridor between Durban and Gauteng are relatively congested and at some locations like Van Reenen's Pass traffic is extremely vulnerable to interruptions by accidents and weather conditions. Ironically the parallel railway is operating at only 35% of its freight capacity. (White Paper on Freight Transport Policy 2004.)

Considering that maintenance and improvement of existing road infrastructure is not keeping pace with the growth in road freight traffic, increasing rail freight capacity by investing in infrastructure is the key to reducing traffic congestion along our major freight corridors. Termination of general freight services on South Africa's rail network, as suggested by some transportation professionals, is simply not a sensible option.

5. MEETING TRANSPORTATION DEMANDS IN OUR DUAL ECONOMY

5.1 Bridging the gap between the 'first' and 'second' economies

The extent of economic activity in South Africa varies considerably, ranging from sophisticated export-driven automotive industries to subsistence farming in remote rural areas. The mainstream economy, or so-called 'first' economy, is primarily centred in the major cities and towns and in the commercial farming districts, while the 'second' economy is generally restricted to the rural and deep rural areas.

Resource allocation in a dual economy remains problematic, mainly due to the conflicting needs of industry and commerce on the one hand and poor rural farmers on the other. It could be argued that up to now the less-demanding requirements of rural people have often been overlooked.

The unfortunate result of unequal resource allocation is that there is increasing polarisation between the two economies. While urban areas and commercial farming districts are experiencing economic growth and are prospering, the subsistence farmers and their dependants in the rural areas are struggling to survive due to substandard or non-existent facilities, including transport infrastructure.

The challenge to government is to reduce the gap between the two economies by giving all citizens equal opportunity for reaching their potential

5.2 Using rail transport to facilitate rural socio-economic development

According to Todaro (1997:324,328) the answer to alleviating rural poverty lies in the improvement of small and medium farming practises, not only to increase farm incomes, but also to reduce unemployment by using labour-intensive methods. He warns however that sufficient government support, including the provision of transportation infrastructure, is a prerequisite for the success of small-scale agricultural development.

Arnon (1987: 476-477) confirms that adequate transportation infrastructure is a priority for developing agriculture as without it products cannot be marketed or, alternatively, will lose much of their value while in transit to a market.

The condition of most rural roads in South Africa varies from poor to very poor, which places a serious restraint on rural socio-economic development. In the Eastern Cape only 6 233 km or 13% of the province's 48 582 km of rural roads are paved (Annual Transport Statistics 2002:34). Many of the unpaved gravel roads in the province become hazardous or even impassable during wet weather periods.

Road freight operators are understandably reluctant to use poorly maintained gravel roads, as it impacts negatively on transit times and increases vehicle maintenance expenditure. The end result is that many small-scale farmers are faced with high transportation costs which they simply cannot afford. In addition many rural communities in the former Bantustans are not served by road freight haulers and are dependant on taxis and private vehicles to transport their surplus produce to markets.

A possible solution to this dilemma is to upgrade the under-utilised railway lines in rural areas, including feeder roads to rail nodes, and provide a subsidised rail service to farmers and other rural entrepreneurs to stimulate agricultural development. Apart from proving much-needed freight services, rural rail operators could also offer government-subsidised passenger services, thereby improving mobility of the rural poor. An added bonus of a regular passenger service is that it could make remote areas more accessible to tourists.

The provincial government in the Eastern Cape is leading the way in rural infrastructure development with its flagship Kei Rail Project. The primary aim of the project is to restore rail services between East London and Umtata, thereby promoting growth and development along the N2Road/Rail Corridor. This venture is not just about upgrading of a railway, as it also includes the construction of a major link road and the rehabilitation of access roads. Revival of rail services in rural areas is thus also beneficial for road transport operators providing a feeder service to rail depots.

6. CONCLUDING REMARKS

South Africa's secondary road network, managed by the respective provincial road authorities, is in a poor condition. This is mainly due to deferred maintenance, exacerbated by the rapid increase in heavy vehicle traffic. In most provinces substantial funding is required, not only for urgent maintenance, but also for much-needed road reconstruction programmes. Road freight haulers may lose their competitive cost advantage over rail if the 'user pays' principle had to be applied to recover the required funds directly from them.

Existing technical restraints will probably remain part of South Africa's rail legacy. Conversion from the 1 067 mm to a 1 435 mm rail gauge and/or the re-alignment of track

to shorten rail distances and improve transit times between nodes are not at this stage economically feasible options. Although it is not possible to adopt some of the best-practise methods of modern railways because of these limitations, a well-managed and efficient rail service still has the potential to compete with road along our major transport corridors for the conveyance of bulk commodities. In addition, scheduled high-speed container trains could also offer a viable alternative to road transport.

Up to now road versus rail assessments have been based on pure economic theory while, to a lesser extent, there has also been some debate on environmental matters. Economic comparisons between the two transport modes have revolved around 'Western' perceptions of development and prosperity. A much-used argument forwarded by the proponents of road transport is that market forces alone should determine mode preference. Unfortunately, in the process, the broader issues of socio-economic development in the African context are conveniently overlooked. Perhaps its time to challenge the status quo by considering issues such as rural poverty, unemployment and the widening gap between urban and rural economies.

The intended capital expenditure to upgrade existing rail infrastructure is necessary, not only to lower the cost of overland transport, but also to provide a reliable rail service to both urban and rural enterprises. Government's commitment to improve the country's rail network is commendable and should be supported by all role-players in the transport industry. An efficient and customer-focused rail service, in co-operation with road freight companies, will contribute towards reducing the cost of doing business in South Africa.

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