

PERSPECTIVES ON FREIGHT MOVEMENT BY ROAD AND RAIL IN SOUTH AFRICA

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1. INTRODUCTION

For a developing country, South Africa has a relatively extensive road and rail network. The approximately 264 000 km of roads and 20 000 km of rail network (30 600 km of tracks) have largely been built and paid for by previous generations and represent assets of enormous value for Southern Africa. The optimum use, management, maintenance and expansion of these networks are crucial for economic growth and the well-being of the total SADC region.

A major change in the pattern of freight movement occurred since the late 1970s with the gradual deregulation of freight movement on roads. Although the carriage of goods by road was restricted between 1930 and 1990 through a permit system, economic restrictions with respect to freight transport were phased out from 1977 to 1990, with the consequence that road freight haulage grew substantially. This relaxation was influenced by the gradual movement in the South African economy to more industrial/manufacturing activities versus the production of basic agricultural and primary commodities (minerals, ore, etc.). Road freight transport with its higher reliability, flexibility, accessibility, security and shorter transit time, in comparison with rail freight transport, is preferred by the industrial sector and this has contributed to the increase in road haulage.

Total annual freight movement on road and rail changed as follows between 1985 and 2000:

	Road	Rail
1985	504 million tons 46 billion t-kms	170 million tons 92 billion t-kms
2000	647 million tons 70 billion t-kms	178 million tons 100 billion t-kms

It is in the movement of general freight (versus haulage of minerals and ore) where the biggest changes in freight carried by Spoornet, is evident. Figure 1 illustrates how this reduced by 25% since 1988/89. With the low average growth of total freight movement by rail over the past 15 years (0,3% p.a. in tonnage of freight and 0,6% p.a. in ton-km) versus the higher growth of road freight (1,7% p.a. in tonnage and 2,9% p.a. in ton-km), Spoornet (and its parent company Transnet) have had to carefully evaluate their role in the freight market. Statements regarding their "unfair" competitive situation have been made on a number of occasions. For example, Minister Jeff Radebe referred in November 2000 (1) to the "increase in the permitted Gross Vehicle Mass for trucks", the "weak policing system" and the notion that trucks generate a range of negative externalities (damage to roads,

pollution, road congestion and road accidents), for which they do not bear the direct cost. He proposed that “policy measures must be put in place to counteract the consequences of unregulated road haulage. This will serve to level the playing field which is currently tilted very heavily in favour of road transport”.

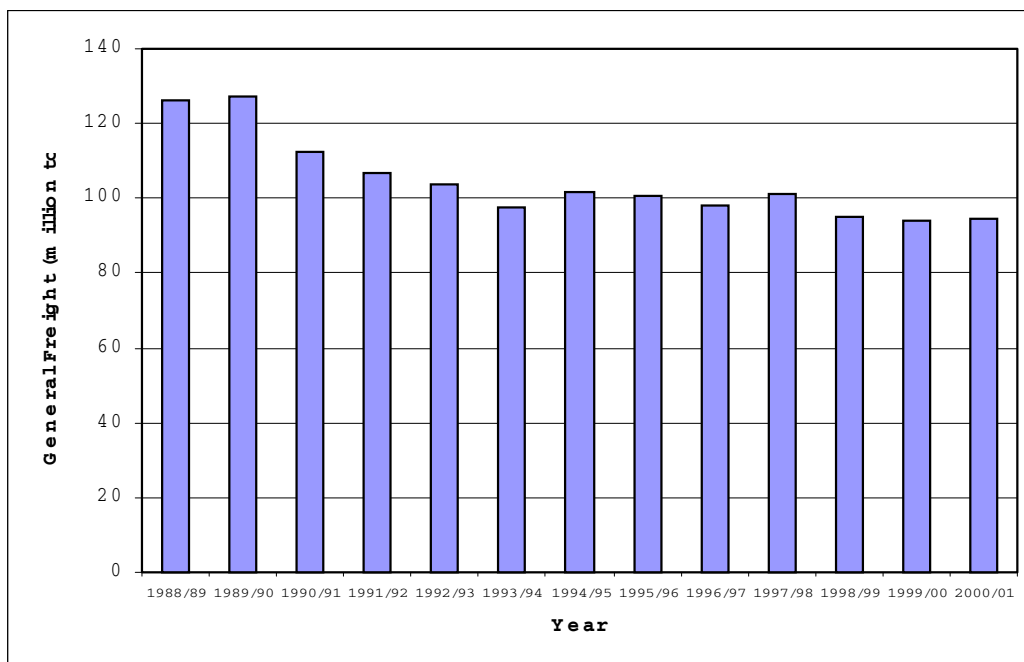


Figure 1: General freight (minerals and ore excluded) carried by Spoornet

Also in their 2001 Annual Report, Spoornet’s management presented the view that they bear their total infrastructure and maintenance cost while, in comparison, the Moving South Africa Agenda of the National Department of Transport (NDOT) indicates that road hauliers do not meet the total socio-economic cost associated with the use of the road infrastructure. Spoornet expressed the belief that the different modes (road and rail) should compete in a free and unregulated market that guarantees equal opportunity and unbiased treatment of all modes. This clearly illustrates that there is a strong perception within Spoornet that road hauliers are being favoured by the current legal requirements and regulatory system.

The objectives of this paper are to provide some perspective on the comparative issues involved. More specifically, the aims are:

- (i) To highlight the development, regulation and cost recovery of the rail and road networks in South Africa;
- (ii) To provide international trends in freight movement and logistics, and
- (iii) To indicate possible measures to “level the playing fields” for rail and road freight operators to the benefit of the South African economy.

2. DEVELOPMENT, REGULATION AND COST RECOVERY

The development, regulation and cost recovery of freight movement by road and rail are described in detail in a number of articles written in 1996 by members of the (then) Department of Transport Economics of the University of Stellenbosch as inputs into the “Spoornet Project” on the transport function in Southern Africa (2). A short abstract of these articles is provided below in an effort to give some background and perspective.

2.1 Development of road and rail networks

Road – Before 1910 most road links between towns catered for oxwagons and consisted mainly of tracks. The railway system was being expanded and the important rail links between the ports and inland towns were built. Between 1910 and the middle of the thirties motorised vehicles started to replace oxwagons and from then to the seventies, the original national road network (consisting of two lane surfaced roads), linking all major towns, developed. From 1970 to the middle of the eighties the emphasis moved to the urban areas where huge investment was required to cater for the ever increasing commuter and business traffic. The national road system was enhanced with the introduction of freeway sections in the vicinity of the major cities. From the middle of the eighties to the present time, funds for road construction were restricted and the Department of Transport commenced with a toll road network to upgrade old and inadequate sections. This has developed into the current situation where existing roads are being tolled in order to maintain and upgrade them to the required standards, even though the tolling is unpopular with the majority of road users.

Rail – Similar to most countries, the South African rail network is the indirect product of the great railway boom in England in the 19th century. The first lines to be opened were in Durban (Point to Durban, 1860) and Cape Town to Eersterivier in 1862. By the late 1870s both the Cape and Natal governments were in control of the short rail lines existing in their jurisdiction. Even though there were “Anti Railway Conferences” towards the end of the 1880s, most people realised that the days of the oxwagon were coming to an end. Politics (the Transvaal Republic versus the British rule in the Cape and Natal) played a major role in rail development towards the end of the 19th century. With the establishment of the Union of South Africa in 1910, the South African Railways (SAR) came into being. The railway network at that time joined the major inland towns with the ports. Branch lines to all agricultural areas could not be built and the National Road Motor Services was created in 1912 to act as feeder to the existing lines.

By the late 1920s, the era of rapid construction of rail lines ended, as the technological development of motor vehicles impacted upon the rail lines. The growth and adaptability of road haulage presented serious problems to the SAR from early on. By 1925 the SAR accepted a policy of not building any more branch lines and using road transport as far as possible.

2.2 Regulation of road and rail networks

Road – At the beginning of the twentieth century the road system was in its infancy and little competition between road and rail existed. However, it was not long (by the twenties), owing to the tariff structure of the SAR, before profitable high-tariff traffic started to divert to the road network. The Le Roux Commission recommended a fair degree of economic control over road transportation in 1929. The Motor Carrier Transportation Act (Act 39 of 1930) followed a year later and established Local Road Transportation Boards (LRTBs), which had to issue motor carrier certificates on routes and within areas where competition with the SAR was most severe. Sparsely populated areas remained uncontrolled.

By 1941 motor carrier transportation on all roads was brought under the control of Act 39 and virtually all transportation of persons and goods for reward was under control of LRTBs. The Page Commission recommended in 1947 that the regulation of road transportation and also the prevention of excessive competition between road and rail freight transport should be continued.

Both the Marais Commission (1965) and the Van Breda Commission (1977) concluded that control and regulation of road freight had to remain, although the latter brought in the concept of gradual deregulation. The Road Transportation Act (Act 74 of 1977) made concessions to achieve freer competition, but control by the LRTBs on the type of goods, area of operation and the effective permit period remained. The National Transport Policy Study (NTPS) of 1986 proposed new principles, such as the desirability of competition, easier entry into the road transport market, more scope for private initiative, encouragement of small business and the creation of a more efficient and a less costly transport system for South Africa. The recommendations of the NTPS led to the Transport Deregulation Act (Act 80 of 1988), which together with the Road Traffic Act (Act 29 of 1989) abolished economic regulation of the freight transport industry and replaced it with technical and safety regulation of operators and vehicles.

Rail – With the formation of the SAR, Clause 127 of the Act of the Union (1910) stipulated that the railways had to be administered on business principles, but that agricultural and industrial development had to be promoted by means of cheap transport. This led to a differentiated tariff structure with relatively high tariffs for industrial freight and low tariffs for agricultural and mining products.

The Schumann Committee proposed in 1964 that rail rates should be aligned more closely to the real cost of transport and in 1965 this was endorsed by the Marais Commission, which also suggested a modernisation programme for the rail network. In 1981 the South African Transport Services Act (Act 65 of 1981) changed the SAR&H to SATS. Section 7(1) of this act stated that SATS should be administered on business principles. The De Villiers Report on SATS (1986) was largely accepted by Parliament. It became government policy that the goods transport market should be deregulated and that SATS should be pursuing profit and pay tax like any other company and that privatisation of government enterprises receive high priority.

Eventually in 1989, the Legal Succession to the South African Transport Services Act created the mechanism to commercialise SATS and to separate the (uneconomic) commuter services from the freight and long distance passenger services. The former services became the responsibility of the SA Rail Commuter Corporation (SARCC) and the latter resorted under TRANSNET.

2.3 Cost Recovery from road and rail users

Road – Up to the formation of the Union of South Africa in 1910 roads were funded in a number of ways including subsidisation of Divisional Councils (in the Cape Province), annual District Board tax, tolls, annual road tax on white males over the age of 21, special funds voted by the Volksraad (Transvaal Republic) and licences (3). After 1910 road users paid customs duties (4% of the Union's total revenue) as well as Provincial taxes. Municipalities (and in the Cape Province the rural Divisional Councils as well) constructed and maintained their roads from property taxation with grants received from the Provinces for main roads passing through urban areas. By 1935 the National Roads Act (Act 42 of 1935) created the National Road Fund (NRF), which received 3 pennies per gallon from the customs duty on imported petrol, supplemented by Treasury loans and interest on the Fund's cash. In 1936 the NRF collected 1,36 million pounds from the customs duty, which could be considered as a substantial amount for that time.

By 1961 the NRF reached the milestone of the final repayment of all Treasury loans for road building. Since then all motor vehicle fuels (i.e. not only the imported fuels) would contribute to the NRF at 5,35 cent per gallon. The National Transport Commission had to take full financial responsibility of all National roads and 70% of the costs of special roads, with the provinces funding the rest. Between 1935 and 1972 the NRF spent R760 million on roads. In the 1971/72 financial year the fuel levy amounted to 1,8 cent/litre, which meant R92 million for the financial year (just over 5 billion litres of fuel sold).

In summary it can be said that up to the eighties road users by and large paid for the construction and maintenance of national and provincial roads through a dedicated fuel levy (NRF received part of the total fuel levy), licences, etc, whilst in cities and towns the construction of roads were largely financed from property taxes. The Automobile Association at that time found that road users were contributing more than R2,6 billion per annum to public funds through a variety of levies, taxes and other fees, whilst expenditure on all roads was only R1,3 billion in 1981/82. The situation changed further in July 1987 when the government decided to stop earmarked funding – the NRF disappeared and funds for road-building would only be allocated from the central fiscus. At this point the NRF received 8,0 cents/litre petrol and 10,0 cents/litre diesel from the total taxation of 22,5 cents/litre. By 1989 the customs and excise levy amounted to 35,9 cents of the price of petrol of R1,05 per litre.

The road lobby was discontented with this situation as road users perceived that they were becoming tax milk cows more than ever before. In a way they even subsidised SATS directly – in the SATS Annual Report of 1988 it was stated that there was an income of R293 million for the oil pipeline (from the carriage of fuel) which resulted in a surplus of R217 million for them. Furthermore, high ranking officials such as Mr G P Croeser, the then Director General of Finance, expressed the opinion in 1990(4) that “we are overprovided with basic road infrastructure” and “all levies on road users are simply taxes of one kind or another and as such should end up in the central Treasury”. Mr Croeser admitted that road users were bearing a heavier tax burden than non-users, “and to that extent rough fiscal justice is being done”. In his mind there was no way of precisely apportioning road user benefits and thereby allocating the costs. It was essentially a matter of the political office bearers determining national priorities.

This approach by Mr Croeser (and others) has caused difficulties for many people in the debate regarding road cost recovery. Should the fuel levy be considered a general tax such as VAT or income tax, then the only road user charge would be the contribution to the Road Accident Fund, licence fees and tolls. Then the argument that road users do not cover road construction and maintenance costs, would be true. A very important economic truth is, however, ignored with this approach: In a free market system, production should be mainly in the hands of the private sector. Transportation is such an essential component of economic activity that it can be considered the fifth component of production – the other four being labour, capital, land and entrepreneurship. Transport creates place and time utility. As road infrastructure cannot in all cases be provided at an acceptable profit, government as agent of communities and the private business sector has to manage and supply road infrastructure. The supplier must be remunerated for this capital good and user charges dedicated to defraying the costs of roads, are applied all over the world. Therefore, just as other utility providers (electricity, water, etc.) are paid directly by their users, so should road users be paying for the road utility that they receive. The case for at least part of the fuel levy to be considered a user charge, is clear.

By 1998 government did in fact decide to allow that five cents of the 86 cents fuel levy per litre (at that time), be allocated to road construction and maintenance. The issue of the road users not paying for the negative externalities caused by them was addressed by the authors in a paper in 2000(5). It was clearly indicated that the total revenue of the state from road users (±R26 billion was estimated), by far exceeds the spending on roads as well as negative externalities caused by road users (estimated at ±R15 billion). Positive externalities, which should be substantial, have not been estimated. It was also pointed out that loaded trucks do not pay levies according to their impact on the road system, when compared with motor cars (5). The frequently made allegations in the Moving South Africa documents that road users pay only a small fraction of the negative externalities that they cause, are therefore considered not true. In the Minister of Finance's "People's Guide", which accompanied his 2002 budget speech, it is indicated that the fuel levy alone contributes 5% of total state revenue, whilst spending on Transport and Communication amounts to 4% of total state spending. See Figure 2 below.

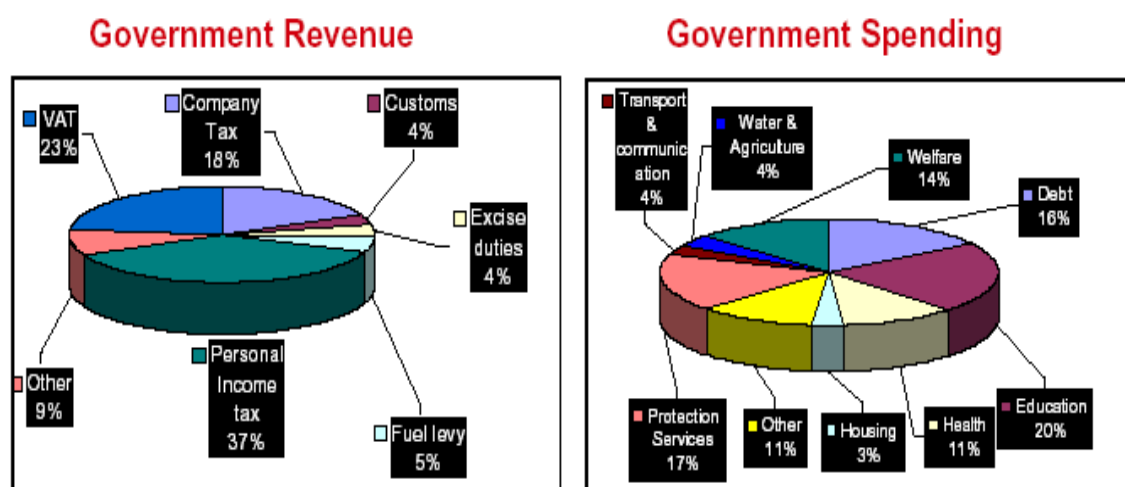


Figure 2: Relative proportions of the budgeted state revenue and expenditure for the fiscal year 2002/03.

Rail – From early on (Clause 127 of the Act of the Union – 1910) it was required that the SAR be operated on business principles, but that due cognisance be given to agricultural and industrial development through cheap transport. It was also made clear that the SAR only needed to cover costs and not make a profit.

Owing to the fact that the SAR (and its successor SATS) had to provide unremunerative socio-economic services, they had difficulty in covering construction, maintenance and operational costs. Even though they were exempted from paying certain taxes, licences and levies on inputs, a grant was allocated to them every year by Treasury to cover costs. Huge profits, as mentioned before, were made on the oil pipeline from Durban to the Reef (paid for by road users) and these were used to cross-subsidise other loss-making rail services.

The SAR have been subsidised in other ways as well – over the years they have been borrowing funds for capital expenditure from Treasury. On these loans there was an obligation to only pay interest, with no requirement to redeem the capital. In addition a lower than market (i.e. subsidised) interest rate was paid. Two further privileges were enjoyed – firstly substantial amounts of interest were sometimes capitalised by Parliament

and secondly, proportions of their capital debt were written off which altogether reduced their financial obligations. The frequently voiced claim that the SAR and its successors have paid in full for the construction and maintenance of their infrastructure is clearly not true – in fact their infrastructure and services were subsidised by the tax payers and even by road users.

3. TRENDS IN FREIGHT HAULAGE AND LOGISTICS

The latest trends in freight haulage by road and rail, as well as the strengths and weaknesses of the two modes are summarised below (extracted largely from Reference 6):

3.1 Road

Road transport has replaced rail carriage as the dominant form of long-distance freight transport. On long hauls, road freight carriers are able to transport certain primary products of an organic nature such as timber, fish, and agricultural products (for example, live-stock, fresh and frozen meats, fruit, vegetables and dairy products); some semi-finished goods; and most finished goods.

Road freight transport is more flexible and versatile than other modes because of vast networks of roads. It can therefore offer point-to-point service between almost any origin and destination. It is this flexibility and versatility that has enabled road freight transport to become dominant in most countries.

Road freight carriage offers the client reliable service with little damage or loss in transit. It generally provides much faster service than rail transport and compares favourably with air carriers on short hauls. Many road freight carriers, particularly those involved in “just-in-time” services, operate according to a scheduled timetable. This results in reliable transit times. Road freight carriers are, therefore, able to compete with air transport for small shipments – i.e. partial loads or less-than-truckload (LTL) consignments – and with rail transport for larger shipments.

Typical strengths of road transport

- Door-to-door service: Road transport is not limited to a fixed route or to fixed terminals. Consignments can be conveyed directly from a shipper to a receiver without the need for specially built terminals.
- Accessibility: Road carriers can deliver in every country or economically active region in the world. Deliveries are therefore usually prompt.
- Freight protection: As a result of the ability to supply a door-to-door service, little handling and few transshipments take place between origins and destinations. Separate feeding/collection and line-hauling are often not necessary, and neither are delivery or distribution activities.
- Speed: This mode maintains short door-to-door transit times, especially over short distances. When delays occur as a result of traffic congestion or other incidents, it is often possible to follow alternative routes.
- Capacity: The vehicle carrying capacity, although relatively small compared with other modes of transport, is adaptable and can be readily increased.
- High frequency: A high service frequency can be maintained as a result of the small carrying capacity and high speed of road vehicles.

Typical limitations of road transport

- Limited carrying capacity: The dimensions and gross mass of road vehicles are limited through legislation.
- High environmental impact: Road vehicles create noise and air pollution.
- Vulnerability to external factors: Inclement weather conditions and traffic congestion can impact on the reliability and punctuality of road transport operations – especially in countries with severe climatic conditions such as heavy fog and snowfalls.
- High energy consumption: To convey one unit of freight, road vehicles consume more energy/fuel than other forms of surface transport.
- Shared right of way: On public roads, the right of way is shared with other traffic, which increases safety and security risks and the occurrence of unexpected delays. An accident involving a truck with hazardous goods on board may result in a road closure lasting several hours. In addition to high accident risk, road vehicles are vulnerable to theft and hijacking.

3.2 Rail

In some countries, and especially in Eastern Europe and Asia, rail is the dominant form of transport. In most countries, rail freight services are available between almost every metropolitan area. However, the rail network is never as extensive as the road network. Because rail transport is limited to fixed routes, it lacks the flexibility and accessibility of road freight carriers. Rail transport provides terminal-to-terminal service rather than point-to-point service for clients, unless they have a rail siding at their facility. If a facility is not connected to a rail link, another transport mode has to be used to gain access to the rail service.

Another disadvantage of rail transport is the long transit time. Load consolidation in marshalling yards adds to the slow transport speed. Rail transport also cannot offer such frequent service as road transport. However, since the deregulation of land freight transport, rail transport has improved significantly in these areas. Transport deregulation increases competitive pressure to lower rail rates, resulting in the increasing use of contract rates by rail carriers.

Rail carriers, in an effort to increase freight traffic volumes, are entering new markets and are participating increasingly in intermodal transport. Freight trains nowadays also travel on timetable schedules, but departures are less frequent than those for road freight transport. If a client has strict arrival and departure requirements, road transport has the competitive advantage over rail transport. Some of these disadvantages of rail transport may be overcome through the use of intermodal transport, which offers the advantages of rail transport combined with the strengths of other forms of transport.

Typical strengths of rail transport

- Almost any type of commodity can be conveyed by rail in special train compositions.
- Large volumes of bulk loads can be carried in single trains over long distances, which can reduce air pollution and ease the traffic burden on roads.
- Rail transport generally costs less (relative to weight) than air and road freight transport, especially over long hauls.

- The mode is not as vulnerable to traffic congestion as road transport is. Theoretically, trains can be scheduled more reliably than road and sea transport.
- The mode is less affected by inclement weather conditions than other modes.
- Rail wagons cannot be stolen or hijacked as easily as road vehicles.
- High average trip speeds can be achieved by trains over long hauls when shunting and the special composition of train sets are not necessary (e.g. unit trains)
- Private sidings can connect the facilities of clients to the rail network to allow for loading and unloading.
- Rail transport is cost- and energy-efficient over long distances and when the carrying capacity is well utilised.
- The accident safety record of rail transport, especially with the transport of hazardous goods, is good.

Typical limitations of rail transport

- Owing to the limitations of a fixed track and specific terminals, rail services often need to be supplemented with additional feeder and distribution services.
- Rail transport has a high freight damage record. Because strong packaging is required to secure the goods, the packaging costs are high.
- Users often still perceive rail services to be of lower quality because of damage to freight and inconsistent service, despite the efforts of rail transport carriers to become more competitive since the economic deregulation of land freight transport.
- Rail transport requires high capital investment.
- Rail transport is vulnerable to pilferage when rail wagons remain stationary in marshalling yards for long periods.
- Directional traffic volume imbalances cause a high degree of empty running, so that return freight revenue often does not cover the costs of the return journey.

3.3 Freight mode choice in South Africa

A study which examined the choice between long-distance road and rail transport of manufactured goods in Southern Africa, conducted five years after the deregulation of the freight transport market, showed that the five most important choice criteria ranked as follows (7): (1) client needs (flexibility), (2) service reliability, (3) loss and damage (goods security), (4) total transport time and (5) freight rates. The results of the study are shown in Table 1.

Table 1: Comparative weights and ranking of modal choice criteria

Criterion	Weights (%)	Modal preference	
		Road (%)	Rail (%)
1. Client needs (flexibility)	26,0	73	27
2. Service reliability	23,6	81	19
3. Loss and damage (goods security)	18,6	77	23
4. Total transport time	16,1	83	17
5. Freight rates	15,7	52	48

The results clearly show that in an industrialising and logistics oriented market, freight transport clients give preference to good quality of transport service (i.e. transport cost is of lesser concern to them) and that they regard road transport service quality as being superior to that of rail transport.

4. STATUS QUO AND QUO VADIS

4.1 From where and where now?

From the above it is concluded that the playing fields in the market for freight transport have hardly ever been level. The following are some of the more important facts illustrating this:

- The rail lines and services were built and provided to enhance economic growth especially at the start of the 20th century, without much consideration for their own financial viability. These operations were subsidised by the tax payers of South Africa and even by road users through various forms of preferential treatment.
- The movement of freight by road was controlled for approximately six decades (1930 – 1990), but the gradual deregulation thereof, since the late 1970s, has caused a gradual shift of especially general freight from rail to roads.
- Road users have become tax milk cows par excellence – also illustrated in the Minister of Finance’s “People’s Guide” to his 2002 budget, where it is indicated that the revenue from the fuel levy alone amounts to 5% of total government revenue, while spending on transport and communication amounts to 4% of total government expenditure.
- Due to their impact, especially on the road pavement, which can be 70 000 to 100 000 times that of motor cars, loaded trucks do not contribute proportionately to motor cars for their use of roads and could be considered to be “subsidised” by motor cars, should all fees and levies associated with road usage be considered.
- The requirement that Spoornet has to pay the same fuel levy as road vehicle operators on the diesel that they use, could be considered as being unfair, should a portion of the fuel levy be seen as a road user charge. Should it be viewed as a general form of taxation (which it apparently is in South Africa), then it falls in the same category as VAT or company tax that Spoornet has to pay.
- The apparent discontentment with the increase in legal axle limits for trucks is difficult to comprehend. Roads and bridges can be built strong enough to cope with the higher loads. If government, as custodians of the road network, is willing to take that responsibility, the higher effectiveness and lower transport cost that may result, is to the benefit of all. Whether the trade off between savings in transport cost and the resultant increase in road maintenance cost, has ever been calculated, is not known. Furthermore, there have never been any government limitations on the axle loads of trains and the same higher efficiencies are presumably possible on the rail service.
- In some areas road freight is more competitive and in others rail freight is more competitive. Road freight transport is generally more competitive for shorter trips and higher value goods and rail for longer trips and lower value goods. An area where the two modes can compete by implication exists.

- In the industrial and logistics oriented market, freight transport clients prefer high quality of service (transport cost is not as important) and road transport service quality is regarded as being superior to that of rail transport.
- In addition to the willingness of transport clients to pay for an effective transport service, organised road transport industry and the Automobile Association (representing road vehicle users) have on several occasions expressed their willingness to pay a due price (and not misdirected indirect taxes) for road usage (8).

4.2 The way forward

It is concluded that freight movement by road and rail has developed and evolved over almost a century in South Africa. In order to be competitive in international trade, the economy (and therefore also the freight transport industry) should be as effective as possible. In view of this, the following is proposed for the way forward:

- (i) Upgrading of existing roads and the provision of new roads should go ahead promptly whenever it is economically justified to do so. In order to support industrial growth, development and competitiveness in South Africa, an equitable road user charge system should be introduced in the country.
- (ii) Consensus should be reached on what part of the road budget should be paid for by road users. Part of the existing fuel levy or additional fuel tax can then be acknowledged as a road user charge, which should be viewed as the price for road usage. This can be agreed upon by industry and the government, and can even avoid the need for further toll roads.
- (iii) The disproportionately high taxation of motor cars (when compared with trucks) is not considered fair and should be addressed through an effective user charge for trucks.
- (iv) Government should take steps to ensure that the technical and safety regulations with respect to trucks are enforced. This refers to speeding, overloading, proper loading of freight, visibility, roadworthiness, driver alertness, driver training, etc.
- (v) Every effort should be made to streamline freight movement by road and by rail, both individually and in the form of logistically effective intermodal operations. Restrictions on both modes should be limited to safety and environmental considerations.

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