

TRANSPORT DEREGULATION : SOME IMPACTS ON QUEENSLAND RAILWAYS

Brian Kane  
Assistant Director  
Planning & Development Branch  
Queensland Railways  
Brisbane  
AUSTRALIA

and

Jerome Fernandez  
Senior Planning Officer  
Planning & Development Branch  
Queensland Railways  
Brisbane  
AUSTRALIA

**ABSTRACT:**

*This paper reviews historical developments in the deregulation of land transport in Queensland, and assesses some impacts of deregulation on Queensland Railways performance. The pattern of deregulation in Queensland is reviewed, and the resulting effect on both road and rail businesses are traced, for both passengers and freight. Economic deregulation has included progressive removal of restrictions on transport of commodities which were previously exclusive to rail, as well as removing specific taxes for road use. Technical deregulation has included gradual relaxation of axle load limits for road vehicles and more recently, approval for the introduction of B Doubles on certain routes.*

*Queensland Railways has adopted positive strategies to compete effectively in a deregulated environment. These include investment in new technologies, working closely with freight forwarders, adopting improved marketing expertise and enhancing its information systems*

*While deregulation has, through increased competition, resulted in lower prices to customers in some instances, it has also imposed cost burdens in other areas. Some of these are briefly discussed. Finally, there remains some constraints on rail to rationalise its operations in a deregulated environment. The community cost implications of these can be quite substantial.*

1.

The pat  
Queensl  
In addi  
with sp  
look at  
notably  
which r  
of a de  
cost re  
policy

2.

2.1

Queens.  
of the  
"Corpor

The Ac  
goods  
power  
essent  
permit

This l  
for th  
restr  
Betwe  
Table

The se  
so-cal  
collec  
discus  
tax v  
1980/  
capac  
capac

1. INTRODUCTION

The pattern of deregulation of road transport with respect to rail in Queensland, which has occurred in the last twenty years is reviewed. In addition, the response of rail towards these trends is highlighted with special emphasis on the movement of some major commodities. We look at the position of our major task, haulage of bulk minerals, notably coal. While there is no apparent comparable road haul with which rail competes, we pose the question - "Is rail haul of coal part of a deregulated international market?" The conclusion looks at the cost recovery aspect of road competition and highlights some possible policy directions for land transport.

2. THE PATTERN OF TRANSPORT DEREGULATION IN QUEENSLAND

2.1 Legislative and Economic Deregulation

Queensland Railways (Q.R.) is headed by a Commissioner, who in terms of the Railways Act 1914-1985, represents the Crown, acting as a "Corporation Sole".

The Act, at no stage, gives the Commissioner the power to regulate goods to rail to the detriment of other forms of transport. This power is incorporated in another Act, The Transport Act of 1960, which essentially governs the movement of goods by road within Queensland by permit and distance.

This latter Act is the medium by which road permit fees are imposed for the road haulage of traffic and contains the list of commodities restricted to rail and for which road operators require a permit. Between 1960-1980 fairly minimal changes were made to the category. Table 1 indicates those goods regulated to rail since 1980.

The second economic regulatory feature imposed on road transport was the so-called road maintenance tax. This was funded by the charges collected by the Transport Department both by the issue of permit fees, discussed previously, and drivers' license fees. The road maintenance tax was brought in in 1957 and was phased out in Queensland by 1980/81. The original tax was based on a formula which considered truck capacity, tare weight and distance applicable to vehicles over 4 tonne capacity.

There is no State fuel tax in Queensland and other Commonwealth fuel taxes, including Australian Bicentennial Road Development Funding (ABRD) and the Australian Land Transport Program (ALTP) are both levied against road and rail. The only other revenue generating road user charges are vehicle registration and weight taxes for trucks collected by the Main Roads Department.

## 2.2 Technical Deregulation

This aspect generally refers to regulations applied by State and Territory Governments to restrict the mass, dimensions, speed and other physical characteristics of heavy vehicles. Like railways, the standard of design of road pavements, bridges, and clearance of structures have allowed increases of load, dimensions and speed over the years. The Report on Economics of Road Vehicle Limits Study, (ERVLS), (NAASRA, 1976) did much to rationalise the standards between States, formerly "the lowest common denominator approach" being used. It effectively increased legal loads from 30.9 tonnes to 38 tonnes in eastern States.

The follow up study, "Review of Road Vehicle Limits" (RORVL), (NAASRA, 1986), took the matter a stage further, and recommended, inter alia, that mass limits for eastern States be one of three options, 41.0t, 42.0t or 42.5 tonnes. In addition, it recommended that B-Double vehicles up to 23.0 metres in length should be allowed to operate on selected routes from terminal to terminal under permit as Medium Combination Vehicles and in accordance with NAASRA Guidelines for the Operation of Medium Combination Vehicles.

The State Cabinet approved these amendments with a load limit for six axle articulated trucks of 41.0 tonnes and introduction of B-Doubles in July, 1987, on designated routes approved by the Commissioner for Transport. These routes include Brisbane to Cairns, Rockhampton-Emerald, Brisbane-Toowoomba to Goondiwindi, Dalby to Roma, Brisbane to Warwick, with a maximum speed of 90km/h. All these routes adjoin major railway routes in Queensland.

While it is too early yet to determine the influence of B-Doubles on rail freight, a predictive model indicates that up to 960,000 tonnes per year could be transferred from rail to road in Queensland. NAASRA (RORVL), felt 3 million tonnes a year for Australia would move from rail to road.

## DEREGULATION : IMPACTS ON QUEENSLAND RAILWAYS

**TABLE 1**

GOODS RESTRICTED TO QUEENSLAND RAILWAYS, 1981-1988

	1981	1985	1988
	1. Coke and Coal	1. Coke and Coal	1. Coke and Coal
	2. Minerals&Ores	2. Minerals&Ores	2. Minerals&Ores
	3. L.P.G.	3. L.P.G.	3. L.P.G.
	4. All grains	4. All grains	4. All grains not classed as feed.
	5. Limestone	5. Limestone	
	6. Bulk Gas		
	7. Raw Sugar	6. Raw Sugar	
	8. Sugar Cane	7. Bulk Petroleum Products	
	9. Bulk Petroleum Products	8. Pavement materials ex Brisbane Quarries to Brisbane Airport	
	10. Motor Vehicles (new)		
	11. Log Timber		
	12. Sawn Timber		
	13. Salt		
	14. Tobacco Leaf		
	15. Navy Beans		
	16. Peanuts		
	17. Prefab. Roof trusses		
	18. Pavement Materials		

3. EFFECTS OF TRANSPORT DEREGULATION ON OPERATORS

Whilst statistics on rail transport are comprehensive and available, there is a paucity of data on road transport, which covers the period of deregulation, except possibly for data available from weighbridges which has been monitored in substantial detail in recent years. Notwithstanding the foregoing, it is considered that from available data, the pattern of traffic movements by road and rail before and after deregulation can be established.

An examination of road and rail traffic passing the Brisbane-Nambour corridor for the periods 1976/77 and 1985/86 has indicated that rail's market share has fallen, from above 50 per cent in 1976/77, to 38 per cent in 1985/86.

An analysis of the comparative shares of traffic carried by road and rail for both the western and northern corridors from Brisbane

indicates that rail's market share appears to have stabilised at around 40 per cent over the last few years.

These market share estimates are based on total tonnages crossing a cordon located immediately to the north of Brisbane. The market share estimates are not considered to reflect the true transport task carried out by rail, which would be better represented by a comparison of net tonne kilometres carried by each mode. This data, however, is not readily available for road transport.

Further, market 'shares' are based on total tonnages moved, irrespective of whether or not the tonnages carried by road represent potential markets for rail.

Figure 1 shows a comparison of the major freight types carried by road and rail for the Brisbane-Nambour corridor, for the six months to June, 1986.

#### 4. THE RAILWAYS RESPONSE TO TRANSPORT DEREGULATION

Q.R. has adopted positive strategies to compete effectively in a deregulated environment. These have allowed Queensland Railways to retain and in some instances, increase its market share of specific businesses.

##### 4.1 The adoption of new technology

The adoption of new technology has been given greater emphasis as a means by which the railways can become more competitive. Probably the most striking example of this is the electrification of Q.R.'s Main Lines. Stages 1, 2 and 3 of the Main Line Electrification Project, which are now operational, serve mainly coal and grain, while Stage 4, due for completion in late 1989, will see the introduction of faster, more fuel efficient, more powerful, electric locomotives into general freight services. Transit times between Brisbane and Rockhampton will be cut by 28 per cent, from 14 hours at present, to 10 hours. This will allow the railways to receive freight later each day, and deliver the freight to the destinations earlier. Electric freight services will affect trains beyond the electrified section as the benefits of the reduced transit time will be relayed to those locations as well. The unit load per locomotive in Stage 4 is expected to increase by 60 per cent, because of extensive civil works carried out in conjunction with electrification.

Other examples of new technology include the introduction of centralised train control and elimination of many manned railway stations. Variations of this method of train control include a computerised Train Order system on less dense traffic sections of track. The mechanisation of various operations including track maintenance, computer controlled workshops machinery, and the

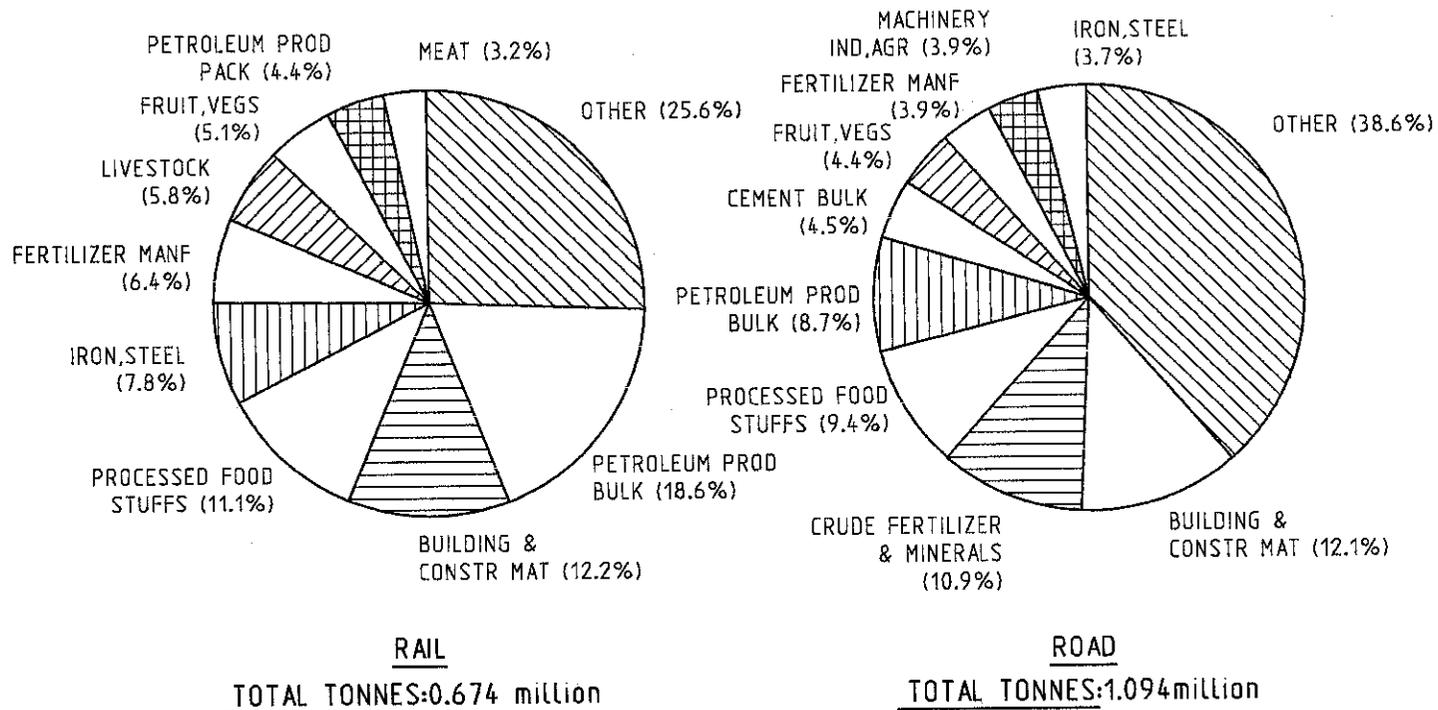


FIGURE 1. COMPARISON OF RAIL AND ROAD FREIGHT TRAFFIC  
BRISBANE - NAMBOUR CORRIDOR, JANUARY TO JUNE 1986

introduction of self diagnostic systems in locomotives are further applications of new technology. The introduction of Automatic Train Control between Brisbane and Gladstone will reduce train crewing to a driver only.

These innovations are enabling Queensland Railways to minimise its costs and remain competitive in a fiercely competitive environment.

#### 4.2 Alterations to work practices

A major review of industrial arrangements was carried out in the early 1980's, and a number of arrangements which resulted in excessive payments, particularly in relation to shift working, were terminated. Other initiatives which were aimed at rationalising and improving the efficiency of operations included the following :-

- Removal of an arbitrary maximum distance of 193 kilometres (120 miles), the daily limit for a crew working suburban passenger trains in the Brisbane area. This practice originated in the days of steam trains. There was no justification for the continued application of this restriction in the operation of high speed electric trains.
- Elimination of the practice whereby train crews would not work through the depots on either side of their base depot.
- Elimination of the requirement that there should be a minimum number of staff at certain goods sheds in the state, irrespective of whether such staff were warranted by the workloads.
- The introduction of computer assisted crew rostering, with the achievement of substantial cost savings.
- The introduction of two man crewing on the majority of freight trains on the State's main lines. This has allowed the removal of the guard's van from these trains.
- Elimination of a large number of other work practices, developed historically, but not conducive to the efficient operation of a modern transport organisation.

#### 4.3 Encouraging the growth of freight forwarding agents

With the growth of road transport services in Queensland following progressive deregulation of transport, Queensland Railways was faced with an inherent competitive disadvantage. It was unable to provide a door to door service to customers, by virtue of having a fixed right of way, the only exception being where customers owned private sidings at both origin and destination.

DEREGULATION : IMPACTS ON QUEENSLAND RAILWAYS

Additionally, many of the railways goods yards were designed and constructed in the 19th Century to cater for steam train operations. Some of the characteristics of these yards included

- .. short siding lengths;
- .. poor provision of access by road delivery vehicles;
- .. goods shed floor heights not matching wagon floor heights, and
- .. goods shed floors generally of timber construction, unable to handle forklift operation.

In a changing competitive environment, the railways lacked the investment funds to improve their freight terminals. Additionally, the railways needed a road pick up and delivery service at the forwarding and receiving stations.

The solution has been to encourage the growth of private enterprise freight forwarding agents. These agents provide a pick up and delivery service, and load rail wagons at modern terminals which are privately owned. The railways performs the line haul function. The railways are therefore able to provide a door-to-door service, through the freight forwarding agents. The strengths of the rail mode, i.e. large tonnages, exclusive right of way operation, ability to determine its own priorities, etc., are combined with the flexibility of the road operation to extend the service right to the customer's door.

Table 2 indicates the growth in traffic handled by freight forwarding agents from 1976 to the present time.

**TABLE 2**      **GROWTH IN TRAFFIC HANDLED**  
**BY FREIGHT FORWARDING AGENTS**

<u>Financial</u> <u>Year</u>	<u>Total General</u> <u>Merchandise</u> <u>tonnes</u>  ( '000)	<u>Tonnes carried through</u> <u>Freight Forwarding</u> <u>Agents</u>  ( '000)	<u>Percentage</u> <u>of total</u> <u>General</u> <u>Merchandise</u> <u>carried By</u> <u>Freight</u> <u>Forwarding</u> <u>Agents</u> <u>(%)</u>
1975/76	1,902.9	221.1	11.6
1980/81	1,847.0	306.8	16.6
1985/86	2,419.1	585.3	24.2
1986/87	2,510.9	617.7	24.6

#### 4.4 The adoption of improved marketing expertise

Q.R. has recognized that to compete more effectively, it will need to improve its marketing expertise and significant progress has been made. A comprehensive review has been made of the railways freight rate structure, the structure has been simplified and many anomalies, which had evolved over a long period of time, were eliminated. The rates have been more competitively based. Costing procedures have been introduced in a systematic way to ensure that rail freight rates earn sufficient revenue to cover costs, except in those areas identified as community service obligations. Market research and intelligence have been initiated, to develop business plans, strategies and targets for specific commodities.

#### 4.5 Enhancement of information systems

The availability of up to date information is a crucial requirement in effective decision making by management. Q.R. manages a fleet of approximately 19,000 freight oriented wagons, 600 locomotives, and employs approximately 24,000 staff, as at 1st January, 1988.

The information for management decision making has been improved through the introduction of computer based systems in the following areas :-

- A Rollingstock Information and Control System monitors the movement of locomotives and wagons throughout the State network. Major customers now have access to this system. The wagon fleet has been subsequently reduced by 3600 wagons.
- A Personnel Information System, by which personnel records are now computerised.
- Computerised Freight Accounting, with the associated production of commodity statistics information.
- Computerised Passenger Reservations System for long distance passengers, both intrastate and interstate.
- Computerised rail costing models.
- Computer based Stores Control Systems.
- Computer based systems in many other areas of the organization.

#### 4.6 Improvements in Productivity

Over the past decade, Q.R. has emphasised the importance of improved productivity across all its activities as a means to achieving greater competitiveness and improved performance. Comprehensive reviews of staffing arrangements have been conducted, and staff have been withdrawn from areas of declining business activity and redeployed into areas of increasing business.

## DEREGULATION : IMPACTS ON QUEENSLAND RAILWAYS

These initiatives, together with many other productivity initiatives, has enabled Q.R. to cope with a greatly increased traffic task, while actually reducing the number of employees.

Total staff numbers have been reduced and in fact, are planned to be reduced further from 25,330 in January, 1984, to 22,150 in June, 1992.

Productivity per employee, measured as net tonne kilometres/employee has increased by 548 per cent in the last 20 years.

### 5. SOME SPECIFIC IMPACTS OF DEREGULATION

The impacts of transport deregulation in some specific industry areas will be discussed. These will show that, while deregulation may theoretically result in greater competition and reduced prices to customers, in practice this is not always the case.

#### 5.1 The transport of petroleum products

Bulk petroleum was deregulated in South East Queensland on 1st April, 1987 and in the rest of Queensland on 1st July, 1987. Road transport can compete legally with rail on any haul, although the transport of petroleum products by road transport has been allowed through the issue of road permits, for several years.

Petroleum products are hauled from Brisbane and other coastal ports, to country locations. Q.R. has sought to retain its market share of this business through the introduction of block trains, accompanied by substantial price incentives. Approximately 97 per cent of rail tank cars are owned by the oil companies, of a total fleet of 560 rail tank cars. Block trains now operate from Brisbane, Gladstone and Townsville to country centres with up to 5 trains per week. Whilst rail transport prices for the major oil companies have been reduced in recent years, there has been no appreciable reduction in price to the end user.

Q.R. is cautiously optimistic about retaining market share in this traffic in the future by providing customer oriented services.

#### 5.2 The transport of raw sugar

Queensland Railways has traditionally carried out the major transport task in the haulage of raw sugar to the Ports of Cairns, Townsville and Mackay. This transport was deregulated in 1985 and transport changes in these three areas following deregulation are discussed below.

5.2.1 Cairns

Since the opening of the Cairns Bulk Sugar Terminal in 1964 up to 1983, Queensland Railways had transported raw sugar from three of the four mills in the area to the port. Transport by rail was ensured by an agreement between Q.R. and the three mills for twenty years from 1964. Following expiry of the agreement in 1983, the three sugar mills opted to use road transport. There have been three notable effects following withdrawal of rail transport:-

- The road transport operator has increased his freight rates substantially above normal road transport cost indices.
- Local councils and community groups have expressed concern at the 40 semi-trailer (2 bins) and dog trailer (2 bins) round trips per day.
- A local authority involved has found the road maintenance costs excessive, and an approach was made to Q.R. to contribute towards road improvements in the area.

5.2.2 Townsville

The four mills in the Burdekin Valley are served by rail. Q.R. introduced high capacity bottom discharge bulk sugar wagons for this operation in 1982. Capacity improvement with the new bottom discharge wagon when compared to the previous arrangement of using sugar boxes on flat wagons is 72.2 per cent. Terminal operations in Townsville have been streamlined with the construction of a balloon loop and high capacity unloader. More efficient operations have provided a real reduction in freight rates in recent years.

5.2.3 Mackay

Four out of the eight mills serving the Mackay area use rail. In the early 1980's, the sugar industry worked in close association with Queensland Railways to upgrade its bulk sugar terminal at Mackay. A new high capacity sugar unloader was introduced, and a balloon loop was constructed to improve the efficiency of train operations. Higher capacity wagons were also introduced into this traffic. With the threat of road transport with B-doubles, Q.R. has responded by submitting a proposal in which sugar from all the mills in the Mackay region will be transported by rail in high capacity bottom discharge wagons, similar to those used in Townsville. A response from the sugar industry is currently awaited.

5.3 The Transport of Coal

Q.R. has a major role in transport of coal and other minerals in Queensland. Most of these projects require the movement

## DEREGULATION : IMPACTS ON QUEENSLAND RAILWAYS

of several million tonnes per year and require journeys of 250km or more from mine to port. While these traffics are currently regulated to rail, the sheer size and distance haulage of the tasks dictate the logical use of rail to generate the economies of scale attributed to that mode. Hence, very little road transport is involved but some permits are granted to road for small domestic tasks where there is no suitable rail alternative.

The question posed, however, is whether or not the coal haulage is open to any competition. In fact, there are other "deregulating" forces which demand efficient transport at minimum cost. When one views the export market for coal particularly, one sees extraordinarily fierce competition between producers. There exists therefore, a need for railways to maintain a price structure which does not jeopardise the competitive capability of its customers. This is a very effective deregulated market.

There are two aspects to this task, freight rates applicable to coal and other mineral projects are the prerogative of Government. Operating costs and technical input lie in the domain of Railway Administration. The Government has reacted positively by reducing rail freight rates.

The cost structure of Australian Coal exports relative to our competitors, has deteriorated in recent years. In response to this loss of competitive edge, the Government reduced existing freight rates by 10 per cent, applicable from January 1st, 1984, to those mines which had started operating after 1977. In addition, operation of the escalation clause was suspended for a period from 1st January, 1984 to 31st March, 1985 and then to operate at 50 per cent until March, 1987. The concessions granted at that time are still operative, although normal escalation now applies. More recently, a direct link between the coal price and the freight rate has been established. The effect of this moratorium on the freight rate applicable to a selected mine for the period 1982-1987 is shown in Figure 2.

The second aspect is technological input into the coal operation. Capital input has been obtained generally from coal companies for purchase of rollingstock and upgrading of the track, signalling, communications and wagon repair facilities. This has been repaid to the companies by way of freight rebates including interest over specified periods. The availability of capital has enabled Q.R. to construct a high quality standard of railway to ensure reliability and the prompt delivery of contract tonnages. Our main customers, the Japanese, insist on this aspect, reliability of service, for their steel and power generation.

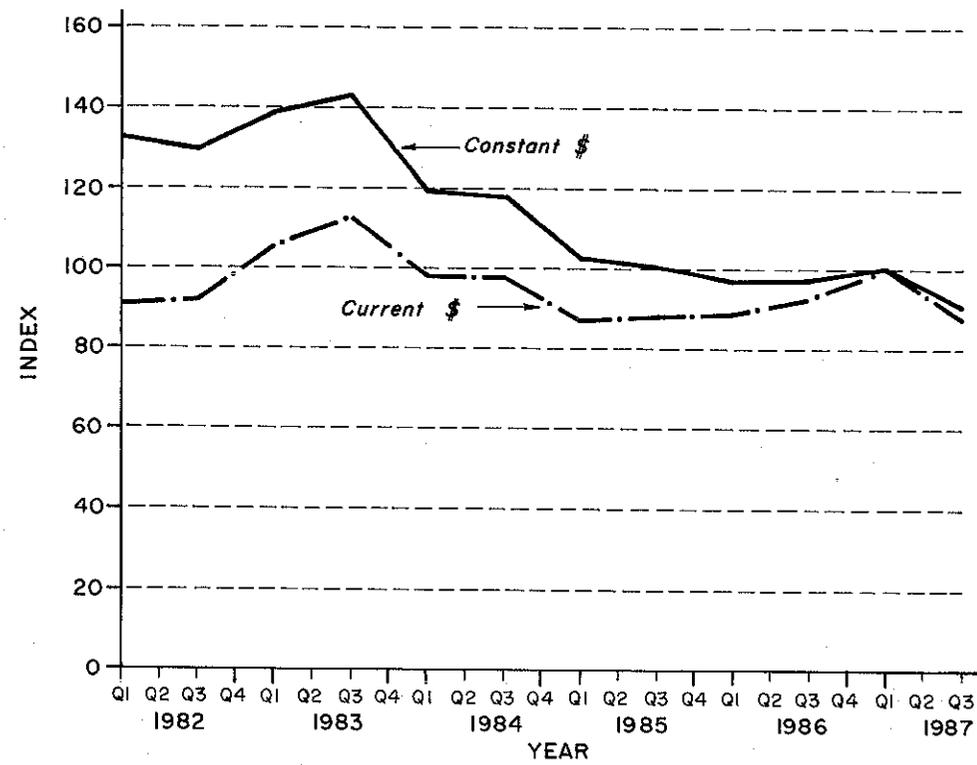


FIGURE 2. TYPICAL COAL MINE FREIGHT RATE INDEX

## DEREGULATION : IMPACTS ON QUEENSLAND RAILWAYS

### 5.4 Grain Transport

In the last three financial years, total grain haulage, regulated to Queensland Railways, has varied between 2.43 million tonnes and 3.45 million tonnes per annum. Given the importance of the grain crop to the Queensland rural economy, every endeavour has been made to apply the unit train concept to the haulage; about 70 per cent of grain trains now operate in this form. A number of branch lines have been upgraded to take heavier, more powerful locomotives and higher axle load wagons. A freight rate discount has applied as well, and the refund is used by Bulk Grains Queensland to extent sidings to expand the unit train concept. Two man crews have also been introduced. Particular attention has been paid to terminals to speed up both loading and unloading processes.

The Fisherman Islands Terminal at the Port of Brisbane is designed to handle a 1750 net tonne grain train in 2.5 hours including various grain types. Fumigation is carried out in the silo, not in the wagon as was previously done. The net effect has been to reduce average wagon turnaround from 4.8 days to 2.5 days. To account for the fluctuating grain task, a number of wagons are designed as multi-purpose carriers and can be used in grain, sugar or coal haulage, as required. Notwithstanding the comments to the contrary in the report of the Royal Commission into Grain Storage Handling Transport (1988), Q.R.'s grain traffic does cover its long run avoidable costs, including total branch line costs and makes a significant contribution towards its fixed corridor costs and overheads. Grain rail freight rates in Queensland are the lowest grain rail rates in Australia and have been frozen for a period of three years despite an inflation rate of 8 per cent per annum.

Don McKechnie, former Chairman of Bulk Grains Queensland, was reported as saying (McKechnie, 1988) that when you move around the wheat growing districts, you find growers in their thousands do not want deregulation.

## 6. ADDITIONAL COMMUNITY COSTS OF DEREGULATION

Progressive deregulation of land transport in Queensland in recent years has been introduced with considerable external costs being imposed on the wider community. These include road safety aspects, external impacts of owner drivers, environmental impacts, overloading and cross-subsidisation of road maintenance costs, among others.

### 6.1 Road safety aspects

The increasing volume of heavy trucks on Queensland roads has increased the risk of fatal accidents. Laird (1987) noted that, although heavy trucks form a small fraction of all motor vehicle registrations, their involvement in fatal accidents was high. The National Road Freight Industry Inquiry (1984) found that in a multi-

vehicle accident involving a truck, other vehicle occupants were far more likely to be killed than truck occupants (in such accidents 10 per cent of fatalities were occupants of trucks and 90 per cent were occupants of other vehicles).

Research carried out with data from Britain by Gregg (1983) has shown that on a tonne-kilometre basis, road freight transport causes 18 times more fatalities than by rail with the death rate per tonne-kilometre by road increasing for the heavier trucks.

Other road safety related aspects noted by the National Road Freight Industry Inquiry (1984) include the following :-

- A belief that usage of amphetamines (stimulants) by long distance truck drivers was widespread. These drugs are used by drivers to stay alert while operating for often illegally long hours, and are a possible cause of hazardous driving.
- The laws governing driving hours were being largely ignored and drivers log books were largely falsified.
- Strong indications that road speed limits were largely ignored by truck drivers, particularly by drivers of articulated trucks under highway conditions.

Laird (1987) has estimated that the total cost of accidents caused by heavy road vehicles in Queensland was in excess of \$59 million for 1985.

#### 6.2 External impacts of owner-drivers

The Bureau of Transport Economics (1979) noted that the major problem perceived within the long distance road haulage industry was the financial plight of the owner-driver.

The National Road Freight Industry Inquiry (1984) stated that intense competition within the line haul trucking sector resulted in very low returns to owner-drivers in particular. It reported allegations that, to stay in business, many owner-drivers were forced to indulge in practices which included accepting cash payments which facilitate tax evasion, not allowing for loading costs and undercutting rates below the agreement limits. Some of these practices may be completely illegal such as overloading, speeding, falsification of log books and tax evasion.

The Bureau of Transport Economics (1984) reported on the findings of a survey of long distance owner-drivers (LDODS) carried out by the Department of Science and Technology, which found that long distance owner driver operations were characterised by :-

- long working hours of up to 80 hours per week per LDOD

## DEREGULATION : IMPACTS ON QUEENSLAND RAILWAYS

a significant level of indebtedness in the range of \$32,000 to \$35,000 per truck; and

low profitability

The road freight industry is one in which entry is relatively simple. The Bureau of Transport Economics (1984) reported that the only requirements for entry to this industry were the obtaining of a driver's licence and procuring a truck. The tests involved in obtaining a licence were not very demanding although there was some variation across the states.

Whilst entry to the road freight industry may be easy, it is more difficult to leave the industry. The National Road Freight Industry Inquiry (1984) noted significant barriers to exit from the long distance trucking industry, such as the possibility of capital loss upon the sale of the vehicle, and the possible absence of alternative employment opportunities. This Inquiry also found that cyclical downturns in the road freight industry reduced the amount of freight available relative to industry capacity. Further, it noted that when excess capacity arises as a result of barriers to exit, because of a reduction in both the volume of work and the rates paid, operator earnings were severely compressed.

### 6.3 Environmental impacts

These impacts include factors such as noise, emissions, intrusion of privacy, loss of amenity and congestion. The growth in road freight vehicles in Queensland has increased the number of trucks travelling in metropolitan areas. The McDonnell Report (1980) has found that trucks, notably those with diesel engines, are a principal contributor to traffic noise. The National Road Freight Industry Inquiry (1984) noted that the costs of air and noise pollution were highest in urban areas, and may justify the reservation of certain traffics to rail, or the imposition of special charges. Emissions from road vehicles include lead compounds, oxides of nitrogen, carbon monoxide, hydrocarbons, smoke and odours (B.T.E. 1984). The State Pollution Control Commission (1980) found that exhaust smoke, particularly that from diesel vehicles, contains carcinogenic compounds. The Bureau of Transport Economics (1984) noted that smoke and particulate emissions for diesel driven trucks may be 10 times those for a passenger car and possibly more if operating with heavy loads or if the engine was poorly maintained.

Laird (1987) has estimated that heavy truck operations in Queensland for 1985-86 gave rise to an external cost of \$4.3 million for air pollution and \$10.9 million for noise pollution for Queensland. Heavy road traffic increases noise vibration levels and visual nuisance. Where this traffic passes residential areas, it can reduce the quality of life of residents by causing loss of amenity and

intrusion of privacy. The operation of heavy trucks on some parts of the road system can, at certain times, cause congestion to other road users. The effect of this congestion is to cause delays and additional costs, to other road users. While congestion is recognized as a problem, research on the external costs of congestion in Queensland is limited.

#### 6.4 Overloading

Overloaded trucks impose additional costs on the road system. The damaging power of a loaded axle (or group of axles) does not vary linearly with load, but exponentially, to the power of "4", with load. With this relationship if an axle is loaded to double what it should be, it will have sixteen times the damaging power.

The application of this so-called "Fourth Power Law" to Australian and, in particular Queensland roads, is being questioned. Krosch and Hollingsworth (1986) stated that for 85 per cent of the Queensland road network, the exponent may even be as high as "12". They stated that the Fourth Power Law was derived experimentally around 20 years ago in the United States for high quality pavements in which the mechanism of failure was "fatigue". However, much of the rural road network in Australia was of "light" pavement construction over weak sub-grades. For these latter pavements, failure by sub-grade deformation was a real possibility. The Queensland Main Roads Department (1986) reported that for 1985-86, there were 17,267 overloading breaches reported. Of these, some 4614 vehicles exceeded their permitted gross vehicle mass.

#### 6.5 Cross-subsidisation of road maintenance costs

There is an overwhelming amount of evidence which indicates that not only do heavy trucks cause external costs to the wider community, but that the costs of road usage by such trucks is subsidised by other road users, principally by motor car users.

The National Road Freight Industry Inquiry (1984) concluded that the total payments made to governments by users of heavy rigid trucks and articulated trucks was insufficient to cover the allocated costs of their road use; there is no contribution to general tax revenues by heavy rigid trucks. Further, the Inquiry found that articulated trucks were paying little (if any) more than the attributable costs of road use, and were making no significant contribution to joint road costs and certainly no contribution at all to general tax revenues. The Inter-State Commission (1987) noted that road user charges in the form of registration fees and those fuel taxes applied directly to road works are low, and that in the view of the Inter-State Commission, these taxes and charges do not cover the fully distributed financial costs of road works attributable to heavy truck operations.

## DEREGULATION : IMPACTS ON QUEENSLAND RAILWAYS

Luck and Martin (1987) found that the operators of motor cars were over-recovering their share of fully allocated road infrastructure costs, while the revenue paid by operators of heavy vehicles fell well short of, not only their share of fully allocated costs, but also their share of avoidable costs. They also indicated that there was a large cross subsidisation of truck operators by private and business motor car operators. This was estimated to total \$1406 million in Australia for 1986/87 and has been described by the House of Representatives Standing Committee on Transport Communications and Infrastructure (1987) as "the worst example of unintended cross subsidy to come to the Committee's attention".

### 7. SOME CONSTRAINTS ON RAIL TO RATIONALISE ITS OPERATIONS IN A DEREGULATED ENVIRONMENT

Whilst Q.R. operates in progressively deregulated markets, there remain several constraints which prevent Q.R. from achieving a full rationalisation of its operations. Further, deregulation has only been confined to providing entry by road transport into rail's markets. The administrative and legislative controls over the railways have not been eased, limiting the extent to which the railways' performance can be improved. These aspects are discussed in the following sections.

#### 7.1 Community Service Obligations

These can be categorised into three broad categories - inefficient branch lines, passenger services and uneconomic freight operations.

##### 7.1.1 Inefficient Branch Lines

There are several branch lines in the Queensland Railways network which are so unprofitable that in many cases they fail to earn sufficient revenue to meet the cost of track maintenance on the branch. An analysis of the costs and revenues incurred by each branch line has been carried out to highlight those which are unprofitable. The method of assessing revenue has been to credit all paying traffic emanating from the Branch, to which is added paying goods traffic consigned to stations on the Branch, i.e., the method most favourable to the Branch's operating result.

Avoidable costs for branch lines are those which would not be incurred if the branches were closed, i.e., the sum of :-

- direct branch maintenance costs
- direct branch station costs
- wages, stores, fuel and rollingstock repairs proportional to branch operations

The number of inefficient branch lines in the system has increased from 16 to 20, in the period 1984 to 1987, and the overall loss on these lines has increased from \$12.9 million to \$20.9 million. The overall cost recovery rate for these branch lines has varied from 5.5 per cent to 75.3 per cent in 1986/87

#### 7.1.2 Passenger Services

Using a similar approach to that which was used in the analysis of branch lines, an analysis of urban and country passenger traffic carried by Queensland Railways in 1986/87 has indicated that the losses incurred from these services have remained fairly static at around \$68.0 million.

In an endeavour to off-set these results, Queensland Railways has reduced manning levels on the trains and has added fast freight wagons to country passenger trains to increase their earning capacity and has reduced freight services to compensate.

In the suburban area, the advent of a fast, air-conditioned, electric train service has seen patronage rise from 26 million annual journeys in 1979 to 43 million in 1987. Cost recovery has improved from 25 per cent to 52 per cent. These improvements were jointly funded by Commonwealth and State Governments.

However, the heavy losses from these services must be viewed in the context of the community service being provided. In some cases, such services are essential. However, where alternative, more economic forms of transport are available, the continued provision of such services will represent a cost of services foregone in other areas of government activity, e.g. social welfare, health, housing, etc.

#### 7.1.3 Uneconomic Freight Operations

Q.R. has to maintain freight services to many destinations throughout the state. For many, the volumes of freight consigned annually are small. All major centres in Queensland are served well by the railways, principally through freight forwarding agencies. However, Queensland Railways is expected to continue to provide freight services to many smaller locations.

Queensland Railways maintains numerous railway goods sheds and yards throughout the state, including those where freight forwarding agents operate. The traditional outmoded railway goods sheds are essentially intact, as is the workforce of porters, checkers, goods clerks and others associated with traditional railway handling methods.

## DEREGULATION : IMPACTS ON QUEENSLAND RAILWAYS

Whilst the traditional system of freight handling has been retained, the volumes of freight being handled have declined. In many cases, the low volumes of tonnages carried in wagons could be more efficiently handled by other methods. However, many country communities consider the service provided by Queensland Railways to be a valuable social role, even though in practice the same level of service could be provided more efficiently, and at less cost to the taxpayer, in other ways.

### 7.2 Financial and Administrative constraints

Queensland Railways is subjected to the same financial constraints as other public service Departments. Its expenditures from year to year are restricted to what the Treasury Department allocates in its yearly budgets. With few notable exceptions, such as Main Line Electrification, it is therefore unable to raise capital funds to increase the rate at which the system can be modernized and made more efficient and competitive.

The Commissioner for Railways is directed by and is accountable to the State Government. All major decisions made by the Commissioner for Railways in relation to investment, rationalisation, pricing and staffing have to be first approved by the Government. Whilst this arrangement is good in terms of public accountability, it does have the drawback of slowing down the decision making process of the railways. This produces long lead times between decisions to act and actual implementation of actions, and constrains the ability of the railways to act quickly in a competitive environment. There is also limited scope for rewarding good performance in the railways. Conversely, there is a tendency to retain staff, and sacking of staff is only undertaken in extreme situations. However, redundancy packages are now being offered as a means of reducing staff levels.

As outlined by Blackshaw (1979), in a real sense, the impact of de facto economic regulation on rail operations is far more important than regulation on any other mode. Moves in some Australian states to deregulate road transport have not been matched by moves by governments to lessen their de facto control over the economic and financial aspects of rail operations, leaving railways in the worst of both worlds.

### 8. CONCLUSIONS

Deregulation of transport has facilitated the entry of road transport into areas previously which were traditional rail markets. It has allowed increased competition between the road and rail

modes. Where the two competitive modes have been retained, the result has been greater efficiency and lower, competitive prices. In areas where rail has withdrawn from the markets, there has generally been no notable reduction in prices charged to consumers, the petroleum and sugar industries being examples.

Queensland Railways has adopted positive strategies to cope with the deregulated land transport environment, with the result that it has generally retained its market share following deregulation.

Freight deregulation has imposed other costs which are being borne by the wider community. These external costs include increased road fatalities, illegal operations, tax evasion, adverse environmental effects and cross subsidisation of road maintenance costs.

There is a need for improved cost recovery from heavy road vehicles, which currently do not fully cover the maintenance costs of the roads which they use. This has allowed the prices charged by road transport operators to be kept at low levels relative to rail. Improved cost recovery from heavy road vehicles will result in higher road freight prices and, through competitive pricing, allow rail to increase its prices and improve its cost recovery levels as well. In this way, the burdens on the wider community of transport infrastructure costs will be lessened, with the users of transport bearing more responsibility for the costs involved.

Finally, Queensland Railways has to bear the burden of some residual constraints which prevent it from operating more effectively in the deregulated environment. The performance of the railways needs to be viewed in the context of these overriding constraints.

#### ACKNOWLEDGEMENT

The authors thank the Commissioner for Railways, Queensland, for approval to publish this paper. However, the views expressed in this paper are those of the authors, and not necessarily those of the Commissioner for Railways.

Blac  
unpu  
AdvBure  
AustBure  
RoadComm  
1966Greg  
NewHous  
Comm  
and  
CanbInte  
CharKros  
Load  
PapeLair  
1985Luck  
and  
ForuMcDo  
N.S.WMcKe  
1988Natio  
Auth  
of RNatio  
Auth  
Vehic

REFERENCES

- Blackshaw, P.W. (1979), The True Cost of Transport, unpublished paper prepared for the Transport Industry Advisory Council, Canberra.
- Bureau of Transport Economics (1984), Overview of the Australian Road Freight Industry, AGPS, Canberra.
- Bureau of Transport Economics (1979), The Long Distance Road Haulage Industry, AGPS, Canberra.
- Commissioner for Railways, Queensland, Annual Reports, 1966/67 to 1986/87, Brisbane.
- Gregg, S.J. (1983), as quoted, Rails, August, 1983, New Zealand.
- House of Representatives Standing Committee on Transport, Communications and Infrastructure (1987), Constructing and Restructuring Australia's Public Infrastructure, AGPS, Canberra.
- Inter-State Commission (1987), A Review of Federal Registration Charges for Interstate Vehicles, AGPS, Canberra.
- Krosch, A., and Hollingsworth, G. (1986), Trucks, Loads and Roads, Vol. 25, No. 5, Queensland Division Paper, The Institution of Engineers, Australia.
- Laird, P.G. (1987), Queensland Road Freight Deficits, 1985-86, unpublished draft report.
- Luck, D.P. and Martin, I.J., (1987), Road Pricing and Cost Recovery, 12th Australian Transport Research Forum, Vol. 1, p. 125-146, Brisbane.
- McDonnell, G. (1980), Commission of Enquiry into the N.S.W. Road Freight Industry, Vol. IV, Sydney.
- McKechnie, D. (1988), as quoted, The Courier Mail, 20th April, 1988, Queensland Newspapers, Brisbane.
- National Association of Australian State Road Authorities (NAASRA), (1976), A Study of the Economics of Road Vehicle Limits, NAASRA, Sydney
- National Association of Australian State Road Authorities (NAASRA), (1986), Review of Road Vehicle Limits, NAASRA, Sydney.

KANE AND FERNANDEZ

National Road Freight Industry Inquiry (1984),  
AGPS, Canberra.

Queensland Main Roads Department (1986), 1985/86  
Annual Report, Brisbane.

Royal Commission into Grain, Storage, Handling and  
Transport (1988). Vol. 1: Report, Canberra.

State Pollution Control Commission (1980), Control  
of Pollution from Motor Vehicles, Publication MV-3,  
Sydney.

The Railways Act 1914-1985, Government Printer, Queensland

The State Transport Act of 1960, Government Printer, Queensland